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December 15, 2023

P-943-WA
VIA ELECTRONIC FILING

Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Rock Island Hydroelectric Project (FERC Project No. 943)
Filing of Notification of Intent and Pre-Application Document for Relicensing and Request for Non-Public Treatment of Privileged Material and Critical Energy Infrastructure Information

Dear Secretary Bose:

Public Utility District No. 1 of Chelan County (Chelan PUD), the licensee of the Rock Island Hydroelectric Project (Rock Island Project), FERC Project No 943, is pleased to file the enclosed Notification of Intent (NOI) and Pre-Application Document (PAD) with the Federal Energy Regulatory Commission (FERC or Commission) for the relicensing of the Rock Island Project in accordance with the requirements of Section 15(b)(1) of the Federal Power Act (FPA), 16 U.S. Code § 808(b)(1), and 18 Code of Federal Regulation (CFR) Part 5. The Rock Island Project is a 395.72-megawatt facility located on the Columbia River in Chelan and Douglas Counties, Washington. The current FERC license for the Rock Island Project expires on December 31, 2028. Chelan PUD plans to pursue the relicensing of the Rock Island Project using FERC's Integrated Licensing Process (ILP) in accordance with FERC's regulations pursuant to 18 CFR Part 5.

Public and Non-Public Volumes of the PAD

The PAD comprises three distinct volumes. Volume I contains the publicly accessible information required per 18 CFR § 5.6. In accordance with 18 CFR § 5.5(c) and §5.6(a)(1), Chelan PUD is electronically distributing the NOI and Volume I of the PAD to known relevant resource agencies, Tribes, local governments, non-governmental organizations, and members of the public likely to be interested in this proceeding (see attached Distribution List). Chelan PUD will also make the NOI and Volume I of the PAD accessible on the Rock Island Project relicensing website at: www.chelanpud.org/newlicense.

Volume II of the PAD contains engineering and technical drawings of Rock Island Project works that meet the definition of Critical Energy Infrastructure Information (CEII) pursuant to FPA section 215A, 16 U.S. Code § 824o-1, and the Commission's regulations at 18 CFR § 388.113(c)(2). Consistent with the Commission's regulations and labeling guidance for filings, each page of Volume II has been labeled as "CUI//CEII," and Chelan PUD requests that Volume II be maintained in the Commission's non-public file, 18 CFR § 388.113(d).

Volume III of the PAD contains location-specific information concerning sensitive species, and is therefore being filed as non-public, privileged information. Consistent with the Commission's regulations and labeling guidance for filings, each page of Volume III has been labeled as "CUI//PRIV," and Chelan PUD requests that Volume III be maintained in the Commission's non-public file, 18 CFR § 388.112(b).

Commencement of Relicensing Proceeding and Environmental Scoping

Pursuant to the ILP regulations in 18 CFR § 5.8, within 60 days of Chelan PUD's filing of the enclosed NOI and PAD (by February 13, 2024), FERC will issue a public notice that commences the relicensing for the Rock Island Project. At the same time it issues this notice, FERC will issue Scoping Document 1 (SD1), which will include a list of environmental resource issues to be analyzed in FERC's environmental document prepared in accordance with the National Environmental Policy Act. FERC's SD1 will invite federal and state resource agencies, Tribes, and interested members of the public to comment on SD1.

As part of the environmental scoping process, FERC will convene public scoping meetings and a site visit to be held within 30 days after its issuance of SD1, 18 CFR § 5.8(b)(3)(viii). Accordingly, Chelan PUD, in accordance with 18 CFR § 5.6 (d)(1), proposes that FERC host day and evening public scoping meetings in Wenatchee, WA, on March 14, 2024, and the site visit for the Rock Island Project on March 15, 2024. Chelan PUD understands that FERC will determine and publicly announce the final date(s), times, and locations of the scoping meeting(s) and site visit, and this information will be published in the local newspaper. Chelan PUD will provide an additional notice to stakeholders subscribed to its relicensing communication system to confirm the location and time of the scoping meeting(s) and site visit once the details are finalized.

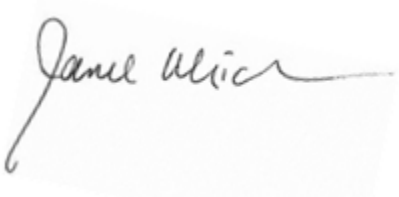
Request for Designation as FERC's Non-Federal Representative

In accordance with 18 CFR § 5.5(e), Chelan PUD requests designation as FERC's non-federal representative in relicensing the Rock Island Project for purposes of consultation under: (1) Section 7 of the Endangered Species Act and the joint agency regulations specified in 50 CFR part 402, Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and the implementing regulations specified in 50 CFR § 600.920; and (2) Section 106 of the National Historic Preservation Act and the implementing regulations specified in 36 CFR § 800.2(c)(4).

Conclusion

Chelan PUD looks forward to working with FERC staff, federal and state resource agencies, Tribes, and all other interested parties in the relicensing of the Rock Island Project. If there are any questions or comments related to the NOI, PAD, or any of the other information presented herein, please contact Janel Ulrich, Hydro Licensing Manager, at Janel.Ulrich@chelanpud.org or 509-661-4400.

Sincerely,



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Attachments: Distribution List
Notification of Intent (NOI)
Pre-Application Document (PAD)

cc: Distribution List
Jeff Deason, Kleinschmidt Associates

Rock Island Hydroelectric Project (FERC Project No. 943)

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NOTIFICATION OF INTENT

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
203 OLDS STATION ROAD
WENATCHEE, WA 98801

DECEMBER 2023

United States of America
Federal Energy Regulatory Commission

Public Utility District No. 1 of Chelan County | Project No. 943

Notification of Intent
To File an Application for a New License
For a Major Water Power Project
For the Rock Island Hydroelectric Project (FERC P-943)

Pursuant to Section 15(b)(1) of the Federal Power Act, 16 U.S.C. § 808(b)(1), and Section 5.5 of the Federal Energy Regulatory Commission's (FERC or Commission) regulations at Title 18 of the Code of Federal Regulations (CFR), Public Utility District No. 1 of Chelan County (Chelan PUD), the Licensee of the existing Rock Island Hydroelectric Project (Rock Island Project) FERC Project No 943, hereby notifies the Commission of its unequivocal intention to file an Application for a New License for the Rock Island Project.

In accordance with 18 CFR §5.5 and §16.6(b), the following information is provided:

1. Licensee's Name and Address:

Public Utility District No. 1 of Chelan County
203 Olds Station Road
Wenatchee, Washington 98801
Phone: 509-663-8121

Chelan PUD requests that all correspondence and service of documents related to this notification and subsequent proceedings be addressed to:

Kirk Hudson, General Manager
Public Utility District No. 1 of Chelan County
203 Olds Station Road
Wenatchee, WA 98801
Email: Kirk.Hudson@chelanpud.org
Phone: 509-661-4265

Justin Erickson, Chief Strategy & Stakeholder Officer
Public Utility District No. 1 of Chelan County
203 Olds Station Road
Wenatchee, WA 98801
Email: Justin.Erickson@chelanpud.org
Phone: 509-661-4379

Janel Ulrich, Hydro Licensing Manager
Public Utility District No. 1 of Chelan County
203 Olds Station Road
Wenatchee, WA 98801
Email: Janel.Ulrich@chelanpud.org
Phone: 509-661-4400

2. Project Number:

FERC Project No. 943

3. License Expiration Date:

December 31, 2028

4. Unequivocal Statement of Intent:

Chelan PUD hereby unequivocally declares its intent to file an Application for a New License for the Rock Island Project by December 31, 2026, two years prior to the license expiration date. Chelan PUD will utilize the Commission's Integrated Licensing Process (ILP) in support of this relicensing.

5. Principal Project Works:

The Rock Island Project works consist of:

(a) An approximately 3,580-foot-long concrete gravity dam featuring a 1,184-foot-long gated spillway section containing 31 spill bays with vertical-lift crest gates divided into east and west sections by a fish ladder that consumes a 32nd bay;

(b) Powerhouse 1, an 870-foot-long by 20-foot-wide by 110-foot-high concrete powerhouse situated on the left bank (north side of the river) and integrated with the dam, housing 11 generating units (10 operating and one station service);

(c) Four single-circuit 115-kilovolt (kV) primary transmission lines, extending approximately a 0.5 mile from Powerhouse 1 to the shore, where the four lines are joined electrically into three lines prior to runing approximately 1.5 miles northwest to the McKenzie switchyard;

(d) Powerhouse 2, a 470-foot-long by 230-foot-wide by 135-foot-high powerhouse located on the right bank containing eight generating units;

(e) Two single-circuit 115-kV transmission lines, running approximately 2 miles northwest from Powerhouse 2 to the McKenzie/Valhalla switchyards;

(f) Three fishways (left, middle, and right); and

(g) The East Bank Fish Hatchery, located immediately east of the Rocky Reach Dam.

The Rock Island Reservoir extends approximately 20.7 miles upstream from the Rock Island Dam. The primary tributary of the Columbia River within the Rock Island Reservoir is the Wenatchee River. The Rock Island Project Boundary extends approximately 1 mile up the Wenatchee River. The normal maximum surface area of the reservoir covers 3,521.7 acres, with a gross storage capacity of 126,312 acre-feet (ac-ft) and a usable storage capacity of 12,189 ac-ft.

6. Project Location:

State:	Washington
Counties:	Chelan; Douglas
City or nearby city:	Wenatchee; East Wenatchee; City of Rock Island; Malaga
Stream or body of water:	Columbia River

7. Installed Plant Capacity:

The FERC-authorized installed generating capacity of the Rock Island Project is 395.72 megawatts (best gate).

8. The names and mailing address of:

(i) Every county in which any part of the project is located, and in which any Federal facility that is used or to be used by the project is located;

Chelan County, Washington
400 Douglas Street
Suite 201
Wenatchee, Washington 98801

Douglas County, Washington
P.O. Box 747
Waterville, Washington 98858-0747

The Rock Island Project uses no Federal facilities.

(ii) Every city, town, or similar political subdivision;

A. In which any part of the project is or is to be located and any Federal facility that is or is to be used by the project is located, or

City of Wenatchee
P.O. Box 519
Wenatchee, Washington 98807-0519

City of East Wenatchee
271 9th Street NE
East Wenatchee, Washington 98802

City of Rock Island
5 N Garden Avenue
Rock Island, WA 98850

Unincorporated community of Malaga

The Rock Island Project uses no Federal facilities.

B. That has a population of 5,000 or more people and is located within 15 miles of the existing or proposed project dam;

City of Wenatchee
P.O. Box 519
Wenatchee, Washington 98807-0519

City of East Wenatchee
271 9th Street NE
East Wenatchee, Washington 98802

City of Quincy, Washington
104 B Street SW
P.O. Box 338
Quincy, Washington 98848

(iii) Every irrigation district, drainage district, or similar special purpose political subdivision:

A. In which any part of the project is or is proposed to be located and any Federal facility that is or is proposed to be used by the project is located; or

Upper Columbia Irrigation District
3300 SE 8th Street
East Wenatchee, Washington 98802

Wenatchee Reclamation Irrigation District
514 Easy Street
Wenatchee, Washington 98802

The Rock Island Project uses no Federal facilities.

Additional nearby Irrigation Districts outside of the Rock Island Project Boundary but may be interested in the proceeding:

Stemilt Irrigation District
1213 Laverne Place
Wenatchee, WA 98801

Lower Stemilt Irrigation District
4597 Stemilt Hill Road
Wenatchee, WA 98801

B. That owns, operates, maintains, or uses any project facility or any Federal facility that is or is proposed to be used by the project;

No irrigation district, drainage district, or similar special purpose political subdivision owns, operates, maintains, or uses any Rock Island Project facility.

The Rock Island Project uses no Federal facilities.

(iv) Every other political subdivision in the general area of the project or proposed project that there is reason to believe would be likely to be interested in, or affected by, the notification; and

No other political districts or subdivisions are likely to be interested in or affected by the notification.

(v) Affected Indian Tribes.

Tribes that may have an interest in this proceeding are as follows:

TRIBE	CONTACT
Coeur d'Alene Tribe	Tribal Chair: Chief Allan 850 A Street; P.O. Box 408 Plummer, ID 208-686-1182
Confederated Tribes and Bands of the Yakama Nation	Tribal Chair: Gerald Lewis P.O. Box 151 Toppenish, WA 98948
Confederated Tribes of the Colville Reservation	Tribal Chair: Jarred-Michael Erickson P.O. Box 150 Nespelem, WA 99155
Confederated Tribes of the Umatilla Indian Reservation	Tribal Chair: Kat Brigham 46411 Timine Way Pendleton, OR 97801
Confederated Tribes of the Warm Springs Reservation	Tribal Chair: Raymond Tsumpti P.O. Box 1299 Warm Springs, OR 97761
Kalispel Tribe of Indians	Tribal Chair: Glen D. Nenema P.O. Box 39 Usk, WA 99180
Kootenai Tribe of Idaho	Tribal Chair: Jennifer Porter 100 Circle Drive Bonners Ferry, ID 83805

TRIBE	CONTACT
Nez Perce Tribe	Tribal Chair: Shannon Wheeler P.O. Box 305 Lapwai, ID 83540
Sauk-Suiattle Indian Tribe	Tribal Chair: Nina Maltos 5318 Chief Brown Lane Darrington, WA 98241
Spokane Tribe of Indians	Tribal Chair: Greg Abrahamson P.O. Box 100 Wellpinit, WA 99040
Wanapum Tribe	Wanapum Leadership: Clayton Buck P.O. Box D4 Beverly, WA 99321

9. Whether the Application Is for a Power or a Non-power License:

The Rock Island Project License Application will be for a power license.

10. Distribution:

In accordance with 18 CFR Section 5.5, Chelan PUD is distributing this Notification of Intent and accompanying Pre-Application Document to appropriate federal, state, and interstate resource agencies, Tribes, and local governments, as well as members of the public likely to be interested in the proceeding. The Distribution List includes a complete listing of the notified agencies, Tribes, local governments, non-governmental organizations, and other potentially interested parties.

The information required to be made available to the public pursuant to 18 CFR Section 5.2 is located at Chelan PUD's offices at 203 Olds Station Road, Wenatchee, Washington 98801, and will be made available on Chelan PUD's public relicensing website: www.chelanpud.org/newlicense.

In accordance with 18 CFR §5.6(e), the following information is provided:

11. Public Utilities Regulatory Policies Act Benefits:

Chelan PUD is not seeking benefits under section 210 of the Public Utilities Regulatory Policies Act of 1978 for the Rock Island Project.

PRE-APPLICATION DOCUMENT

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

Specht 2021

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
203 OLDS STATION
WENATCHEE, WA 98801

December 2023

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TERMS AND ABBREVIATIONS

1978 Plan	1978 Recreation Plan
2-D	two-dimensional
7Q10	7-day, 10-year frequency

A

ACLT	Apple Capital Loop Trail
ADA	Americans with Disabilities Act
ac-ft	acre-feet
AIS	aquatic invasive species
Alcoa	Alcoa Corporation
APE	Area of Potential Effect
APP	Avian Protection Plan
Article 412	Standard Land Use Article

B

BGEPA	Bald and Golden Eagle Protection Act
BHU	Station Service Unit
BiOP	Biological Opinion
BLM	United States Department of Interior Bureau of Land Management
BLM-S	BLM WA Sensitive
BMP	best management practice
BOR	United States Department of Interior Bureau of Reclamation
BPA	Bonneville Power Administration
BTMP	Bull Trout Management Plan

C

CAFÉ	Community for the Advancement of Family Education
Cascade Loop	Cascade Loop National Scenic Byway
CDLT	Chelan-Douglas Land Trust
CFR	Code of Federal Regulations
cfs	cubic feet per second
CFU	colony forming units
Chelan PUD	Public Utility District No. 1 of Chelan County
CL	confidence limit
COVID-19	Coronavirus Disease 2019
CRITFC	Columbia River Inter-Tribal Fish Commission
CTCR	Confederated Tribes of the Colville Reservation
CTLC	Complete the Loop Coalition
CWA	Clean Water Act

D

DADM	day average of the daily maximum
DAHP	Washington Department of Archaeology and Historic
DART	Columbia River Data Access in Real Time
DDD	dichlorodiphenyl dichloroethane
DDE	dichlorodiphenyl dichloroethylene
DLA	Draft License Application
DO	dissolved oxygen
Douglas PUD	Public Utility District No. 1 of Douglas County
DPS	distinct population segment

E

EA	Environmental Assessment
Ecology	Washington Department of Ecology
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	environmental justice
EO	Element Occurrence
ESA	Endangered Species Act
ESU	evolutionarily significant unit
EWU	Eastern Washington University

F

FE	Federal Endangered
FERC	Federal Energy Regulatory Commission
FMS	Fixed Monitoring Station
FL	fork length
FLA	Final License Application
Form 80	FERC Form No. 80
FPA	Federal Power Act
FT	Federal Threatened
FWMT	Fish and Water Management Tool

G

GAP	Gas Abatement Plan
GIS	geographic information system
GMA	Growth Management Act
Grant PUD	Public Utility District No. 2 of Grant County

H

HRFCPPA	Hanford Reach Fall Chinook Protection Program Agreement
HCP	Habitat Conservation Plan
HCP Parties	Signatory parties to the Habitat Conservation Plan (Chelan PUD, NMFS, USFWS, WDFW, CTCR and Yakama Nation

Hp	horsepower
HNA	Horan Natural Area
HUC	hydrologic unit code
I	
ILP	Integrated Licensing Process
in.	inches
IPaC	Information for Planning and Consultation
ISAB	Independent Scientific Advisory Board
ISR	Initial Study Report
J	
JARPA	Joint Aquatic Resource Permit Application
K	
kcfs	kilo cubic feet per second
kV	kilovolt
kVA	kilovolt-ampere
kVm	kilovolt meter
kW	kilowatt
L	
Lake Chelan Project	Lake Chelan Hydroelectric Project FERC No. 637
LAMIRD	Limited Area of More Intense Rural Development
LiDAR	light detection and ranging
M	
MBTA	Migratory Bird Treaty Act
MCCRP	Mid-Columbia Coho Restoration Program
MCHCA	Mid-Columbia Hourly Coordination Agreement
MCRUIP	Mid-Columbia Recovery Unit Implementation Plan
M&E Plan	Monitoring and Evaluation Plan
MFM-FCBR	membrane filter method/fecal coliform broth
mg/L	milligrams per liter
ml	milliliter
mph	miles per hour
MPN	most probable number
MSA	Metropolitan Statistical Area
MVA	mega volt-ampere
MW	megawatt
MWh	megawatt hour
N	
NEPA	National Environmental Policy Act

NFH	National Fish Hatchery
NGO	non-governmental organization
NGVD 29	National Geodetic Vertical Datum 1929, synonymous with USC&GS structural datum
NH_4	ammonia
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NMFS	National Marine Fisheries Service
NNI	No Net Impact
NOAA	National Oceanic and Atmospheric and Administration
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTU	nephelometric turbidity unit
NWPCC	Northwest Power and Conservation Council
NWI	National Wetlands Inventory

O

OHWM	ordinary high water mark
Okanagan Sockeye	Okanagan River Sockeye Salmon
ONA	Okanagan Nation Alliance

P

PAD	Pre-Application Document
PCB	polychlorinated biphenyl
PCT	Pacific Crest National Scenic Trail
PF	Power Factor
PHS	Priority Habitats and Species Program
pHOS	proportion of hatchery-origin spawners
PID	Preliminary Information Document
PIT	Passive Integrated Transponder
Plan Species	spring and summer/fall Chinook Salmon, Sockeye Salmon, Coho Salmon, and steelhead
PLP	Preliminary Licensing Proposal
PM&E	protection, mitigation and enhancement
Preserve	Home Water Wildlife Preserve
Priest Rapids Project	Priest Rapids Hydroelectric Project P-2114
PSP	Proposed Study Plan
PUD	Public Utility District

R

Recovery Plan	UCR Spring Chinook and Steelhead Recovery Plan
river left	left shoreline of a river as you navigate/look downstream
river right	right shoreline of a river as you navigate/look downstream
RM	river mile
Rock Island Project	Rock Island Hydroelectric Project FERC No. 943
Rocky Reach Project	Rocky Reach Hydroelectric Project FERC No. 2145
RPM	Reasonable and Prudent Measure
rpm	revolutions per minute
RSP	Revised Study Plan
RTE	Rare, Threatened, and Endangered
RV	recreational vehicle

S

SC	State Candidate
SCoRE	Salmon Conservation and Reporting Engine
SCORP	State Comprehensive Outdoor Recreation Plan
SD1	Scoping Document 1
SD2	Scoping Document 2
SE	State Endangered
SEPA	State Environmental Policy Act
SGCN	Species of Greatest Conservation Need
SM	State Monitored
SMA	Washington State Shoreline Management Act
SMM	Shoreline Management Manual
SMP	Shoreline Master Program
SoC	Species of Concern
SS	State Sensitive
ST	State Threatened
Swakane	Swakane Wildlife Area
SWAP	State Wildlife Action Plan

T

TCPs	Traditional Cultural Properties
TDG	total dissolved gas
TMDL	total maximum daily load
Treaty	Columbia River Treaty
TWG	Technical Working Group

U

UCR	Upper Columbia River
UCSRB	Upper Columbia River Salmon Recovery Board
UGA	urban growth area
ULT	Ute ladies'-tresses
umho/cm	micromhos per centimeter

U.S.	United States
USACE	United States Army Corps of Engineers
USC&GS	United States Coast and Geodetic Survey
USEPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USR	Updated Study Report
UW	University of Washington

V

V	volt

W

WAC	Washington Administrative Code
WADNR	Washington State Department of Natural Resources
WDFW	Washington Department of Fish and Wildlife
Wells Project	Wells Hydroelectric Project FERC No. 2149
Wenatchee Sockeye	Lake Wenatchee Sockeye Salmon
WNHP	Washington Department of Natural Resources Natural Heritage Program
WRPC	Wenatchee Row and Paddle Club
WRIA	Water Resource Inventory Area
WRIS	Water Resources Information System
WSDOT	Washington State Department of Transporation
WTA	Washington Trails Association

Y

Yakama Nation	Confederated Tribes and Bands of the Yakama Nation
YNF	Yakama Nation Fisheries
YNFRM	Yakama Nation Fisheries Resource Management

1.0 INTRODUCTION AND BACKGROUND INFORMATION

1.1 Overview

The Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Rock Island Project), Federal Energy Regulatory Commission (FERC) Project No. 943, located on the mainstem Columbia River in Chelan and Douglas counties, Washington. Rock Island Dam, which creates the Rock Island Reservoir, is located approximately 12 miles downstream of the city of Wenatchee, and 20 miles downstream of the Rocky Reach Hydroelectric Project (Rocky Reach Project; FERC Project No. 2145). Chelan PUD will be filing an application for a new license from FERC prior to December 31, 2026, 2 years before the license expiration date, as required by the Federal Power Act (FPA) and FERC's implementing regulations.

Hydropower Glossary: Generating Capacity

What is the difference between a FERC-authorized generating capacity ("best gate"), and a generator's installed nameplate capacity ("full gate")?

The FERC-authorized generating capacity is the authorized installed capacity of the units, as limited by the lesser of each units' generator or turbine at the most efficient operating point, or "best gate" for a given head. At Rock Island, this is 395.72 MW.

The installed nameplate capacity, or "full gate", of a turbine is the manufacturer's rated maximum capacity under design conditions. At Rock Island, this is 628.9 MW.

The Rock Island Project is considered a major[1] project under FERC's regulations, as it has a total FERC-authorized generating capacity of 395.72 megawatts (MW).[2] Originally licensed by the Federal Power Commission, FERC's predecessor agency, in 1930,[3] the Rock Island Project was the first hydropower facility developed on the mainstem Columbia River. Nearly 60 years later in 1989, FERC issued a new license for the Rock Island Project (Appendix A), which included far-reaching new operational parameters and measures designed to meet modern environmental programs—such as the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Clean Water Act (CWA), National Historic Preservation Act (NHPA), Coastal Zone Management Act, and the environmental-focused amendments to the FPA in the Electric Consumers Protection Act of

[1] A major license issued by FERC authorizes the licensee to construct and operate a new project, or operate an existing project, which is capable of generating more than 5 MW for a license term of 30 to 50 years (FERC 2021).
[2] By order dated June 28, 2023, FERC revised the authorized installed capacity at the Rock Island Project from 411,504 kW to 395,720 kW. This change stems from Chelan PUD's ongoing program to rehabilitate the Rock Island Project's turbine generators.
[3] Tenth Annual Report of the Federal Power Commission 229 (1930).

1986—all of which had emerged since the original licensing and development of the Rock Island Project in the 1930s.

In 2004, FERC amended the license to incorporate an Anadromous Fish Agreement and Habitat Conservation Plan (HCP) that resolved FERC's Mid-Columbia[4] proceedings on anadromous fish issues and provided the basis for Chelan PUD's 50-year ESA Section 10 permit for the Rock Island Project.[5] The parties to the HCP are Chelan PUD, the United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Washington Department of Fish and Wildlife (WDFW), Confederated Tribes of the Colville Reservation (CTCR), and Confederated Tribes and Bands of the Yakama Indian Nation (Yakama Nation) (hereinafter referred to as the HCP Parties). Detailed descriptions of Chelan PUD's HCP commitments for fish survival standards and tributary and hatchery funding requirements are outlined in Section 4.3 of this Pre-Application Document (PAD).

As the Rock Island Project now approaches its third overall FERC licensing—and, considering the Mid-Columbia proceeding, the third major FERC proceeding in which the Rock Island Project will be evaluated under modern environmental requirements— it is well-suited to continue operating under a FERC license for the next 50-year license term that Chelan PUD will be seeking in this relicensing effort. The Rock Island Project continues to be an important resource for carbon-free, renewable electricity. Under direction of FERC, other regulators, and the HCP Parties, Chelan PUD is managing and enhancing fish and wildlife resources at the Rock Island Project. And Chelan PUD provides significant recreational amenities throughout the Rock Island Project area that are enjoyed by the public throughout the region.

1.2 About Public Utility District No. 1 of Chelan County

Chelan PUD is authorized under Washington State statutes as a nonprofit municipal corporation, and functions as a customer-owned public cooperative energy district. Chelan PUD provides electrical, water, wastewater, and fiber utilities for Chelan County. It is governed by a five-member Board of Commissioners who are elected by Chelan PUD's customer-owners.

Chelan PUD was established in 1936 and began providing electrical service in 1947. Chelan PUD's core values encompass safety as a collective responsibility, stewardship in the interests of

[4] Although the Rock Island Project is located within the USGS Upper Columbia subbasin, it is commonly known as a "Mid-Columbia" (Mid-C) project.
[5] FERC Accession Number 20040621-3047.

customer-owners and the community, trustworthiness through competence and integrity, and a commitment to operational excellence and innovation driven by personal accountability.

Through purchases and development, Chelan PUD acquired what is now one of the largest non-federal hydroelectric generating systems in the country, consisting of the Rock Island Project, Rocky Reach Hydroelectric Project (Rocky Reach Project; FERC Project No. 2145), and Lake Chelan Hydroelectric Project (Lake Chelan Project; FERC Project No. 637). Chelan PUD's three hydroelectric generating projects generate an average combined total of approximately 9 million megawatt-hours (MWh) of power each year. The three Chelan PUD hydroelectric projects provide renewable power that benefits the economy of Chelan County and parts of the western United States. Chelan PUD uses 17 percent of its total annual generation to meet the electrical needs of its Chelan County retail customers. The remainder, or approximately 83 percent of the total annual generation, is transmitted over the northwest's 16,000-mile grid of high voltage transmission lines to several other load-serving utilities in the western United States; Chelan PUD itself has approximately 322 miles of transmission lines that interconnect to the regional high voltage grid (C. Bowman, Chelan PUD, personal communication, November 1, 2020).

After extensive public engagement and community input, Chelan PUD finalized a 2020-2024 Strategic Plan. This plan is based on the vision statement of providing the best value for the most people for the longest period of time. The plan is designed to be resilient and adaptable to changes in revenue and expenses, with a focus on investing in assets and people, improving customer service technology, and ensuring retail reliability and safety. The plan also includes considerations for communication strategies, funding large water and wastewater system improvements, and long-term utility rate planning. Chelan PUD believes that maintaining the existing strategic priority of investing in assets and people, and Chelan PUD's premier electric generating assets represents an advantage for the county.

1.3 Document Purpose

Pursuant to FERC regulations found at 18 Code of Federal Regulations (CFR) §5.6(b)(1), this PAD provides FERC and stakeholders with existing information relevant to the Rock Island Project. This information is distributed to resource agencies, municipalities, Tribes, non-governmental organizations (NGOs) and all other interested parties to identify issues and related information needs, develop study requests and study plans, and prepare documents analyzing any license application that may be filed. The PAD describes the existing facility, the environmental setting in which it is located, and current and proposed operations at the Rock Island Project. In addition, the PAD analyzes existing information on public and environmental resources relevant to the

evaluation of Rock Island Project relicensing, and it includes a description of Chelan PUD's robust early relicensing engagement efforts that pre-dated the development of this PAD.

The PAD is the first official document produced as part of relicensing. Filing the PAD concurrently with the Notice of Intent (NOI) enables those who plan to participate in the relicensing to familiarize themselves with the Rock Island Project at the beginning of the proceeding. This familiarity is intended to enhance the FERC scoping process and environmental study plan development that follow the filing of the PAD.

FERC regulations require that a licensee exercise due diligence in obtaining and including existing relevant and reasonably available information about the Rock Island Project and related resources in the PAD. To accomplish this, Chelan PUD thoroughly reviewed its own files for relevant information and contacted resource agencies to request information and data they may have about the Rock Island Project or resources. In addition, Chelan PUD conducted searches of other potential information sources, including peer reviewed journal articles, reference books, and the internet.

This PAD is organized to follow the content and form requirements pursuant to 18 CFR § 5.6 (c) and (d), with minor variations in the order presented for enhanced readability. Table 1.3-1 is provided to link the specific FERC regulations with the layout of the PAD. Additional non-required sections, such as Introduction and Background (Section 1.0), HCP (Section 4.3), and Environmental Justice (Section 5.12), have been added to the Rock Island PAD.

Table 1.3-1 Cross-reference Code of Federal Regulations Table

FERC REQUIRED PAD SECTION	18 CFR PART 5.6 CITATION	ROCK ISLAND PAD SECTION
Process Plan and Schedule	§ 5.6 (d)(1)	2.0
Project Location, Facilities, and Operations	§ 5.6 (d)(2)	4.0
Authorized Person	§ 5.6 (d)(2)(i)	4.1
Detailed Maps	§ 5.6 (d)(2)(ii)	4.2.1
Detailed Description of Proposed Facilities and Components	§ 5.6 (d)(2)(iii)	4.4
Description of Current and Proposed Operation of the Rock Island Project	§ 5.6 (d)(2)(iv)	4.5
Current License Requirements	§ 5.6 (d)(2)(v)(1)	4.6
Project Generation and Outflow Records for 5 Years	§ 5.6 (d)(2)(v)(2)	4.6.1
Compliance History	§ 5.6 (d)(2)(v)(3)	4.6.3
Current Net Investment	§ 5.6 (d)(2)(v)(4)	4.6.2
Description of any New Facilities or Components to be Constructed	§ 5.6 (d)(2)(vi)	4.7

FERC REQUIRED PAD SECTION	18 CFR PART 5.6 CITATION	ROCK ISLAND PAD SECTION
Description of Existing Environment and Resource Impacts - General Requirements	§ 5.6 (d)(3)(i)	5.0
Geology and Soils	§ 5.6 (d)(3)(ii)	5.1
Water Resources	§ 5.6 (d)(3)(iii)	5.2
Fish and Aquatic Resources	§ 5.6 (d)(3)(iv)	5.3
Wildlife and Botanical Resources	§ 5.6 (d)(3)(v)	5.4
Wetlands, Riparian and Littoral Habitat	§ 5.6 (d)(3)(vi)	5.5
Rare, Threatened and Endangered Species	§ 5.6 (d)(3)(vii)	5.3.5
		5.4.1.1
		5.4.2.4
		5.4.3.1
		5.4.6.1
Recreation and Land Use	§ 5.6 (d)(3)(viii)	5.6
		5.7
Aesthetic Resources	§ 5.6 (d)(3)(ix)	5.8
Cultural Resources	§ 5.6 (d)(3)(x)	5.9
Socio-economic Resources	§ 5.6 (d)(3)(xi)	5.11
Tribal Resources	§ 5.6 (d)(3)(xii)	5.10
Description of River Basin and Subbasin	§ 5.6 (d)(3)(xiii)	3.0
Preliminary Issues and Studies List	§ 5.6 (d)(4)	6.0
Issues Pertaining to the Identified Resources	§ 5.6 (d)(4)(i)	6.0
Potential Studies and Information Gathering Requirements	§ 5.6 (d)(4)(ii)	6.0
Relevant Federal, State or Tribal Waterway Plans	§ 5.6 (d)(4)(iii)	7.1
Relevant Resource Management Plans	§ 5.6 (d)(4)(iv)	7.2
Summary of Contacts	§ 5.6 (d)(5)	Distribution List is included in the NOI/PAD cover letter.

1.4 References

Federal Energy Regulatory Commission (FERC). 2021. FERC Glossary. Available online: https://www.ferc.gov/industries-data/resources/public-reference-room/ferc-glossary.

Federal Power Commission. 1930. Annual Report - Federal Power Commission 10th (1929-1930). Available online: https://babel.hathitrust.org/cgi/pt?id=nnc1.cu10718370&seq=10.

2.0 EARLY ENGAGEMENT, PROCESS PLAN, AND SCHEDULE

In advance of initiating the formal relicensing process, Chelan PUD conducted voluntary early engagement with stakeholders. Prior to initiation of early engagement, Chelan PUD reached out to the community in multiple ways to inform the general public. This included: hosting booths at the local Saturday market, the Community for the Advancement of Family Education (CAFÉ) outreach, and the Wenatchee Fourth of July celebration; conducting two radio interviews; hosting a virtual open house; building and sharing flyers in English and Spanish; and posting a public website with an option to subscribe to mailing lists. Early engagement began with the development and issuance of a Preliminary Information Document (PID) on July 8, 2021.[6] The PID was developed to present high-level background information to interested stakeholders and provide guidance on the FERC relicensing pre-filing process,[7] solicit feedback on potential issues, and to describe how Chelan PUD, relicensing participants, and the public would communicate during early engagement. The early engagement consultation record can be reviewed in Appendices B.1, B.2 and B.3.

Following publication of the PID, Chelan PUD hosted a public issue identification workshop with stakeholders on October 14, 2021. On November 18, 2021, Chelan PUD hosted a follow-up meeting with all stakeholders to share the relicensing schedule, discuss Technical Working Group (TWG) facilitator selection, describe the upcoming January 2022 meeting schedule, and review the comments received at the October 14, 2021, workshop. In January 2022, Chelan PUD formed three TWGs (consisting of Fish and Aquatic Resources, Wildlife and Botanical Resources, and Recreation and Land Use Resources) for interested stakeholders following a 3-day engagement workshop. The engagement workshop was available to all interested parties and consisted of 2 days of engagement coaching followed by one day of presentations and discussion regarding Chelan PUD's early engagement process and the upcoming FERC relicensing process (Appendix B.1). The TWG process was open to all interested parties including state and federal resource agencies, Tribes, local governments, NGOs, customer-owners, and other interested stakeholders. The purpose of the TWGs was to assist Chelan PUD with identification of existing information and stakeholder concerns and facilitate development of study plans that Chelan PUD could execute

[6] Rock Island Preliminary Information Document.

[7] Pre-filing activity refers to the portion of the relicensing process that occurs prior to Chelan PUD's filing of its final relicensing application with FERC. Pre-filing activities include filing the NOI and PAD with FERC, initial tribal and stakeholder consultation, development and implementation of studies, interim reporting on study plan implementation, and the filing of the Preliminary License Proposal (PLP) or DLA. The post-filing phase of relicensing occurs after Chelan PUD files its relicensing application and consists of activities such as FERC's preparation of an EA or EIS, parties' filing of comments, interventions, and preliminary terms and conditions, and FERC's issuance of the final license (FERC 2021).

prior to relicensing as well as those to be developed and submitted as part of the relicensing process. The TWGs met as needed throughout the early engagement phase to provide technical expertise and represent key stakeholder constituency interests for specific resource areas associated with the Rock Island Project. The TWGs collaborated on the development of the study plans outlined in Section 6.0 and Appendix G (Final Study Plans and Reports).

The TWGs operated under an informal, but mutually agreed upon set of guidelines that outline TWG purposes, structure, roles and participation levels, responsibilities, and communications (Appendix B.4). TWGs shared Rock Island Project-related background information to inform this PAD, identified agency mandates and other relicensing participant goals, developed a list of agreed-upon issues, and reviewed study plans. Chelan PUD intends to continue meeting with TWGs throughout the relicensing process as needed.

2.1 Integrated Licensing Process

The Proposed Process Plan and Schedule (Table 2.1-1) outlines actions by FERC, Chelan PUD, and other participants in the Integrated Licensing Process (ILP) from the filing of the PAD through the filing of the Final License Application (FLA). Chelan PUD developed the Process Plan and Schedule using the timeframes set forth in 18 CFR Part 5. Chelan PUD based the dates in the Process Plan and Schedule upon a NOI/PAD filing date of December 15, 2023, ahead of the December 31, 2023, statuary filing deadline. All subsequent dates in the Process Plan and Schedule are derived from when the NOI/PAD is filed. The FLA must be filed no later than 2 years before license expiration.

Table 2.1-1 Proposed Process Plan and Schedule

RESPONSIBLE ENTITY	MILESTONE	SUBMITTAL/END DATE[1,2]	APPLICABLE FERC REGULATION	REQUIRED PERIOD
PRE-FILING MILESTONES				
Chelan PUD	File Pre-Application Document (PAD) and Notice of Intent (NOI)	December 15, 2023	18 CFR § 5.5; 18 CFR § 5.6; 18 CFR § 16.6(c)	No Later than December 31, 2023
FERC	Initial Tribal Meeting(s)	January 14, 2024	18 CFR § 5.7	30 Days from NOI
FERC	Notice of Commencement of Proceeding and Scoping Document 1 (SD1) Issued	February 13, 2024	18 CFR § 5.8	60 Days from NOI
FERC	Scoping Meetings and Site Visit	March 14-15, 2024	18 CFR § 5.8	30 Days from SD1
Stakeholders	Comments on PAD, SD1 and Study Requests	April 13, 2024	18 CFR § 5.9(a)(b)	60 Days from Commencement
FERC	Scoping Document 2 (SD2) Issued, if needed	May 28, 2024	18 CFR § 5.10	45 Days from SD1 Comment Due Date
Chelan PUD	Proposed Study Plan (PSP) filing	May 28, 2024	18 CFR § 5.11(a)	45 Days from the Deadline for Filing PAD Comments
Chelan PUD	PSP Meeting	June 27-28, 2024	18 CFR § 5.11(e)	30 Days after the Deadline Date for Filing PSP
Stakeholders	Comments on PSP	August 26, 2024	18 CFR § 5.12	Within 90 Days of Filing PSP
Chelan PUD	File Revised Study Plan (RSP)	September 25, 2024	18 CFR § 5.13(a)	30 Days of Close of PSP Comments
Stakeholders	RSP Comments Due	October 10, 2024	18 CFR § 5.13(b)	15 Days from RSP
FERC	Study Plan Determination	October 25, 2024	18 CFR § 5.13(c)	30 Days from RSP
Mandatory Conditioning Agencies*	Formal Study Dispute Resolution Process, if necessary[2]	November 14, 2024	18 CFR § 5.14(a)	20 Days from Study Plan Determination
Study Dispute Panel	Third Panel Member selected	November 29, 2024	18 CFR § 5.14(d)(3)	15 Days from Notice of Study Dispute

RESPONSIBLE ENTITY	MILESTONE	SUBMITTAL/END DATE[1,2]	APPLICABLE FERC REGULATION	REQUIRED PERIOD
Study Dispute Panel	Panel Convenes	December 4, 2024	18 CFR § 5.14(d)	20 Days from Notice of Study Dispute
Chelan PUD	Comments on Study Disputes Due	December 9, 2024	18 CFR § 5.14(i)	25 Days from Notice of Study Dispute
Study Dispute Panel	Technical Conference held	December 14, 2024	18 CFR § 5.14(j)	Assumes the 30th Day
Study Dispute Panel	Panel Finding Issued	January 3, 2025	18 CFR § 5.14(k)	50 Days from Notice of Study Dispute
FERC	Study Dispute Determination	January 23, 2025	18 CFR § 5.14(l)	70 Days from Notice of Study Dispute
Chelan PUD	End of First Study Season	October 25, 2025	18 CFR § 5.15(a)-(d)	1 Year from Study Plan Determination
Chelan PUD	File Initial Study Report (ISR)	October 25, 2025	18 CFR § 5.15(c)(1)	1 Year from Study Plan Determination
Chelan PUD	ISR Meeting	November 9, 2025	18 CFR § 5.15(c)(2)	15 Days from ISR
Chelan PUD	File ISR Meeting Summary	November 24, 2025	18 CFR § 5.15(c)(3)	15 Days from ISR Meeting
Stakeholders	File Meeting Summary Disagreements[2]	December 24, 2025	18 CFR § 5.15(c)(4)	30 Days from ISR Meeting Summary
Chelan PUD	File Responses to Meeting Summary Disagreements	January 23, 2026	18 CFR § 5.15(c)(5)	30 Days from Meeting Summary Disagreements
FERC	Study Dispute Determination	February 22, 2026	18 CFR § 5.15(c)(6)	30 Days from Responses to Disagreements
Chelan PUD	Draft License Application (DLA) or Preliminary Licensing Proposal (PLP) due to FERC	August 3, 2026	18 CFR § 5.15(f); 5.16; 5.18	150 Days from Filing Application; May opt to file a DLA pursuant to 18 CFR § 5.16(c)
Chelan PUD	End of Second Study Season	October 25, 2026	18 CFR § 5.15(f)	2 Years from Study Plan Determination
Chelan PUD	File Updated Study Report (USR)	October 25, 2026	18 CFR § 5.15(f)	2 Years from Study Plan Determination

RESPONSIBLE ENTITY	MILESTONE	SUBMITTAL/END DATE[1,2]	APPLICABLE FERC REGULATION	REQUIRED PERIOD
Stakeholders	Comments on DLA/PLP	November 1, 2026	18 CFR § 5.16(e)	90 Days from DLA/PLP issuance
Chelan PUD; stakeholders	USR Meeting	November 9, 2026	18 CFR § 5.15(f); 5.15(c)(2)-(7)	15 Days from USR
Chelan PUD	File USR Meeting Summary	November 24, 2026	18 CFR § 5.15(f); 5.15(c)(2)-(7)	15 Days from USR Meeting
Stakeholders	File Meeting Summary Disagreements[2]	December 24, 2026	18 CFR § 5.15(f)	30 Days from USR Meeting Summary
Chelan PUD	File Responses to Meeting Summary Disagreements	January 23, 2027	18 CFR § 5.15(f)(5)	30 Days from Meeting Summary Disagreements
FERC	Study Dispute Determination	February 22, 2027	18 CFR § 5.15(f)	30 Days from Responses to Disagreements
Chelan PUD	File Final License Application (FLA)	December 31, 2026	18 CFR § 5.17; 5.18; 4.38(d); 16.8(d)	No Later than December 31, 2026
POST-FILING MILESTONES				
FERC	Issue Tendering Notice	January 14, 2027	18 CFR § 5.19	Within 14 days of the filing date of any application for a license
FERC	Issue Notice of Acceptance and Ready for Environmental Analysis (EA)	TBD	18 CFR § 5.22	When the application meets FERC requirements
Stakeholders, agencies	Comments, Interventions, Preliminary Terms and Conditions Due to FERC	TBD	18 CFR § 5.23(a)	60 Days after Notice of Acceptance and Ready for EA
FERC	Draft EA or Environmental Impact Statement (EIS) Issued	TBD	18 CFR § 5.25	180 Days from Date Responses are due to the Notice of Acceptance and Ready for EA
Stakeholders	Comments on Draft EA or EIS	TBD	18 CFR § 5.25	30 or 60 Days after Issuance of Draft Environmental Document, as Specified in the Notice Accompanying Issuance
FERC	Final EA or EIS	TBD	18 CFR § 5.25	90 days from filing of modified mandatory prescriptions or terms and conditions

RESPONSIBLE ENTITY	MILESTONE	SUBMITTAL/END DATE[1,2]	APPLICABLE FERC REGULATION	REQUIRED PERIOD
Chelan PUD	Rock Island License Expires	December 31, 2028		

[1] All dates are draft and subject to adjustment by FERC.

[2] If the due date falls on a weekend or holiday, the deadline is the following business day.

*Items in grey represent the Formal Study Dispute Resolution Process, which is only necessary if there are study disputes.

2.2 FERC Scoping Meeting and Site Visit

A public scoping meeting and site visit are required as part of the ILP (18 CFR § 5.8). Within 60 days of the filing of the NOI and PAD, FERC will issue a Notice of Commencement of proceeding and Scoping Document 1 (SD1). Within 30 days of the Scoping Notice, FERC will hold public scoping meetings and a site visit in Wenatchee, Washington. Chelan PUD will provide additional notice to stakeholders that are subscribed through their relicensing communication system to confirm location and time of the meeting and site visit upon finalization of details.

Hydropower Glossary: Scoping

Scoping refers to the process of identifying the potential impacts that a project may have on the environment or community and occurs early in the pre-filing phase of the ILP.

During scoping, FERC issues what is called a Scoping Document describing the project, identifying issues, and inviting further comments from the public. FERC will then use this information to determinate what issues should be further analyzed in their independent environmental analysis documents.

Within 60 days of the SD1, stakeholders, Tribes, and the public will be invited to provide comments on the PAD and SD1 and may propose specific studies (Table 2.1-1). These comments and study requests will serve as a way for individuals and organizations to formally express their views regarding the scope of the environmental review process and studies needed to inform FERC and other regulators on environmental effects related to the Rock Island Project.

2.3 Accessing Relicensing Information and Making FERC Filings

The FERC eLibrary will contain all documents filed with FERC, or issued by FERC, related to the relicensing of the Rock Island Project. Anyone with internet access can open the publicly available documents in the FERC eLibrary, or at a minimum, read a description of non-public records (no registration or login is required). Also, Chelan PUD will post major milestone filings and FERC's issuances/orders on the public relicensing website (www.chelanpud.org/newlicense). During the relicensing process, there are multiple methods for relicensing participants to engage in the process using FERC's online tools:

eComment: This method allows the public to submit comments of up to 6,000 characters in length. eComment does not require the participant to create any login credentials or make a subscription to FERC's website or intervene in a specific docket. Users provide their name and email and receive immediate confirmation of their submission.

eSubscription: By eSubscribing, users receive a notification whenever a document is added to the eLibrary for the subscribed docket. Additionally, users will be notified via email with a link that provides direct access to the document. The Rock Island Project's docket number is P-943. This method simplifies keeping track of multiple proceedings in the eLibrary. Users can use the eRegistration online system to create a username and password for login and choose which dockets they would like to follow.

eFile: Participants filing comments on behalf of a company, agency, organization, association, or other non-individual, must have or create a full eRegistration account (not limited to eSubscription) and use FERC's eFiling system. Additionally, this process must be used if an individual wishes to provide a comment exceeding 6,000 characters, or which contains non-text materials, privileged materials, or to file a motion to intervene.

More information about public involvement is provided in FERC's online information guide or by visiting the FERC website at www.FERC.gov.

During the relicensing process, some documents (e.g., the PAD, meeting summaries, study plans, reports, Draft License Application [DLA], and FLA) involve public comment periods that can range from 30 to 90 days (see Table 2.1-1). For documents issued by FERC, Chelan PUD anticipates that FERC will notice and distribute these documents in accordance with FERC's protocols, and these documents will be posted and publicly available in the eLibrary on FERC's website. Chelan PUD will also post these materials on the public relicensing website (www.chelanpud.org/newlicense).

2.4 References

Federal Energy Regulatory Commission (FERC). 2021. FERC Processes. Available online: https://www.ferc.gov/industries-data/resources/ferc-processes.

3.0 GENERAL DESCRIPTION OF THE BASIN

The following section provides an overview of the Rock Island Project river basin, subbasins, affected streams, other hydroelectric developments or diversions, and major water uses in the area around the Rock Island Project, as required in 18 CFR § 5.6 (d)(3)(xiii).

3.1 Columbia River Basin

The Rock Island Project is in northcentral Washington, spanning the Columbia River between Chelan and Douglas counties, near the city of Wenatchee (Figure 3.1-1). The river forms the eastern border of Chelan County (river right),[8] and the northern and western border of Douglas County (river left).[9] Section 3.2 describes the subbasins within the larger Columbia River Basin and identifies the specific subbasin associated with the Rock Island Project.

The Columbia River Basin is the fourth largest river system in North America, encompassing over 250,000 square miles (Marts 1999). The watershed encompasses portions of Washington, Oregon, Idaho, Montana, Utah, Nevada, Wyoming, the Canadian province of British Columbia, and First Nations and Tribal lands (Figure 3.1-2).

The Columbia River originates in Columbia Lake in southeastern British Columbia at an elevation of 2,656 feet (ft) above sea level and courses through the Selkirk Mountains before turning south towards the United States-Canada international border. In the United States, it flows through the semi-arid scablands of northcentral Washington state before turning south and west (Photo 3-1). The last 300 miles of the river form the north-south border between the states of Washington and Oregon as the river runs west to its mouth at the Pacific Ocean (Lang 2021).

Source: Chelan PUD 2021

Photo 3-1 Columbia River near the Rock Island Project Area

From its source in the mountains of British Columbia to its mouth at the Pacific Ocean, the mainstem Columbia River drops an average of 2 ft per mile (Marts 1999). Prior to hydroelectric development, the river created numerous falls and rapids used by Indians as fishing and trading sites, and was noted by European settlers and explorers, such as Lewis and Clark (Fifer 1998).

[8] River right refers to the right shoreline of a river or stream as you navigate or are looking downstream.
[9] River left refers to the left shoreline of a river or stream as you navigate or are looking downstream.

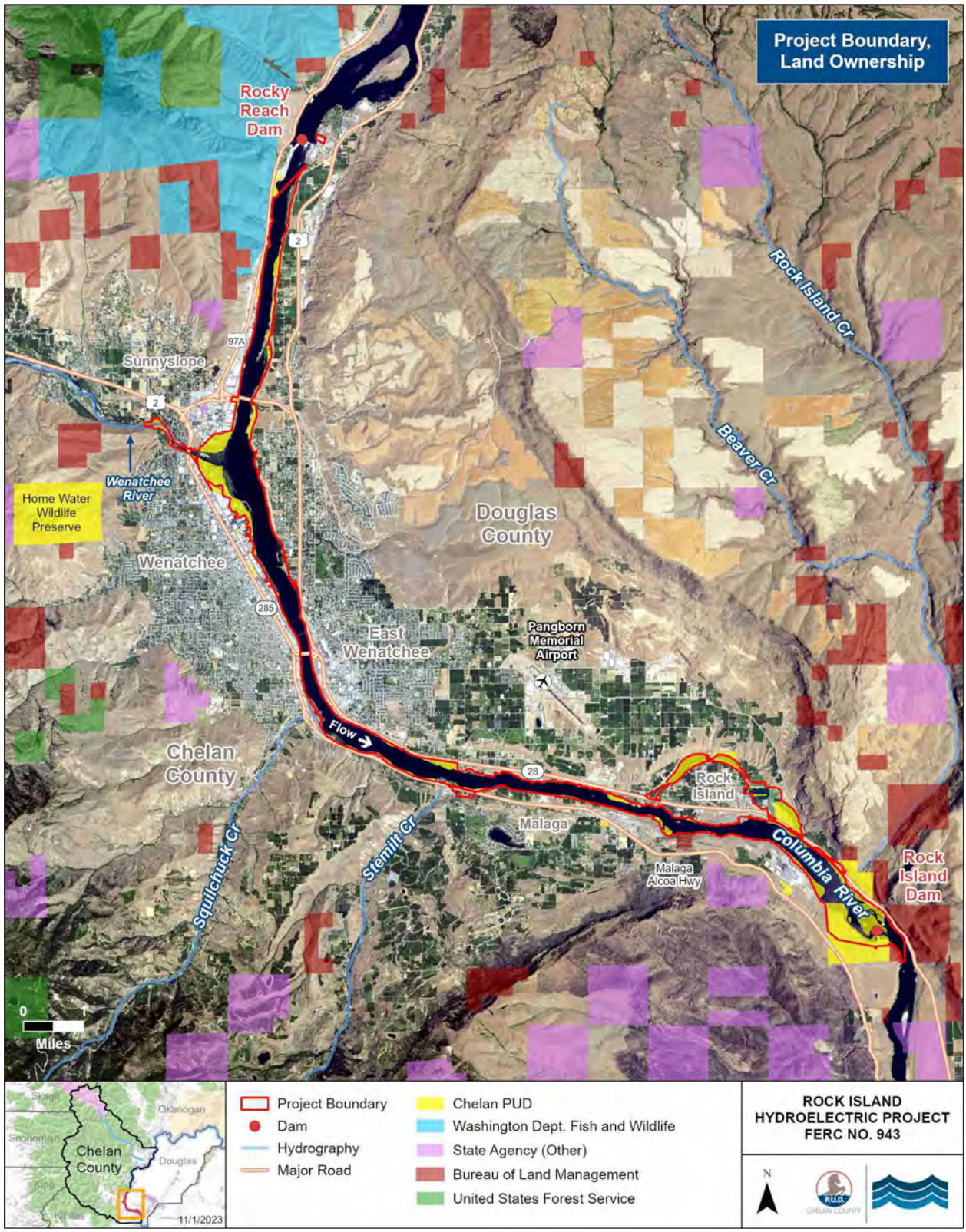

Figure 3.1-1 Rock Island Hydroelectric Project

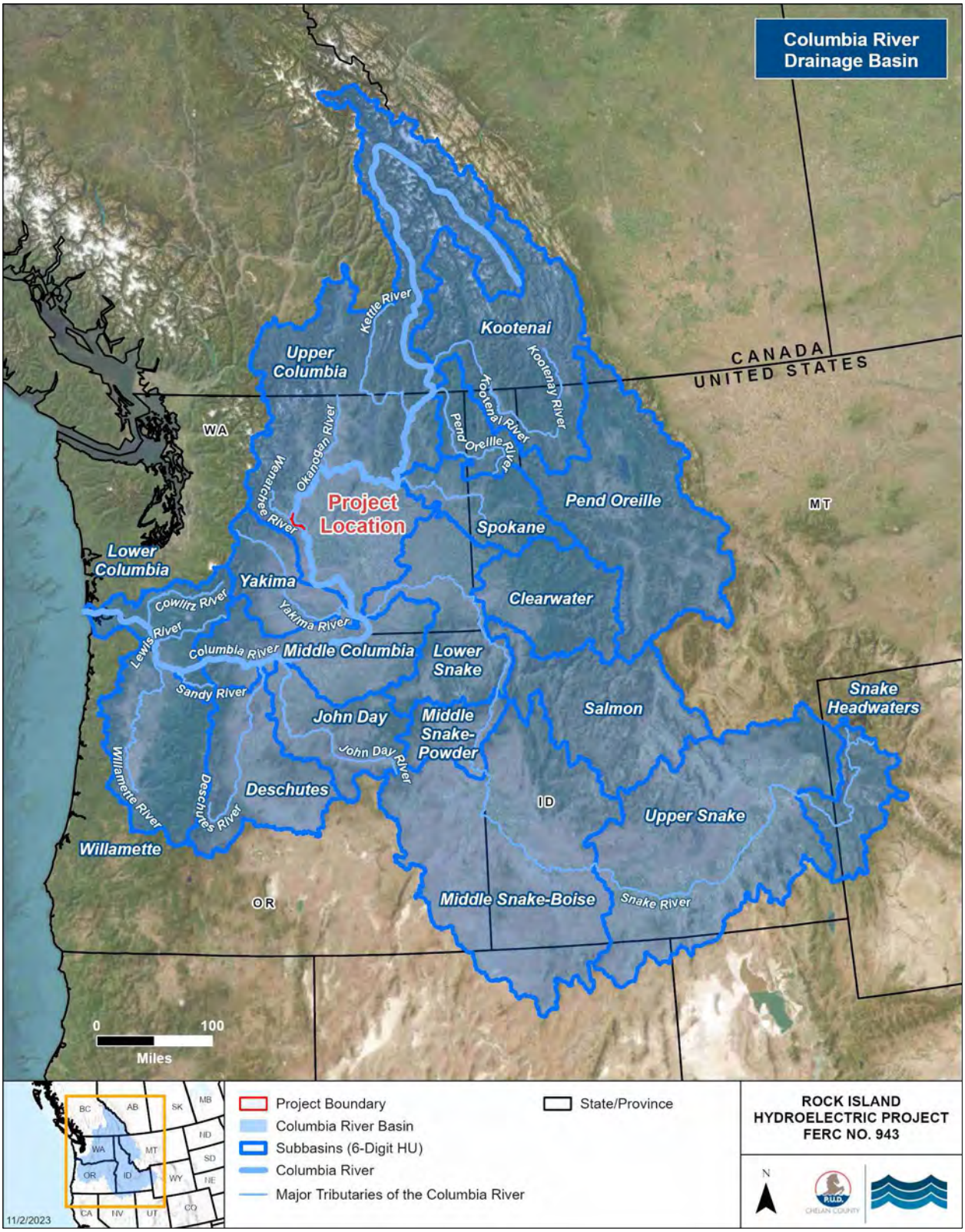

Figure 3.1-2 Columbia River Basin and USGS Subbasins

The gradient and volume of the Columbia River presented ideal conditions for harnessing the river's power, and numerous hydropower facilities have since been constructed in the Columbia River Basin. Although other dams were built in the Columbia River Basin earlier, in 1930, the Rock Island Project became the first dam to span the mainstem Columbia River (Chelan PUD 2017).

Land ownership or management of property in the Columbia River Basin in the United States is a mixture of federal and state agencies, Tribes, and private interests (Figure 3.1-3). More than 20 federal agencies manage federally owned lands within the Columbia River Basin, including the United States Forest Service (USFS), Bureau of Land Management (BLM), National Park Service (NPS), USFWS, Bureau of Indian Affairs, United States Bureau of Reclamation (BOR), United States Army Corps of Engineers (USACE), the United States Army, and the United States Department of Energy.

Large areas of the Columbia River Basin are within ceded lands of Columbia Basin Indian Tribes (NMFS 2002). For further information on tribal resources, reference Section 5.10 of this PAD.

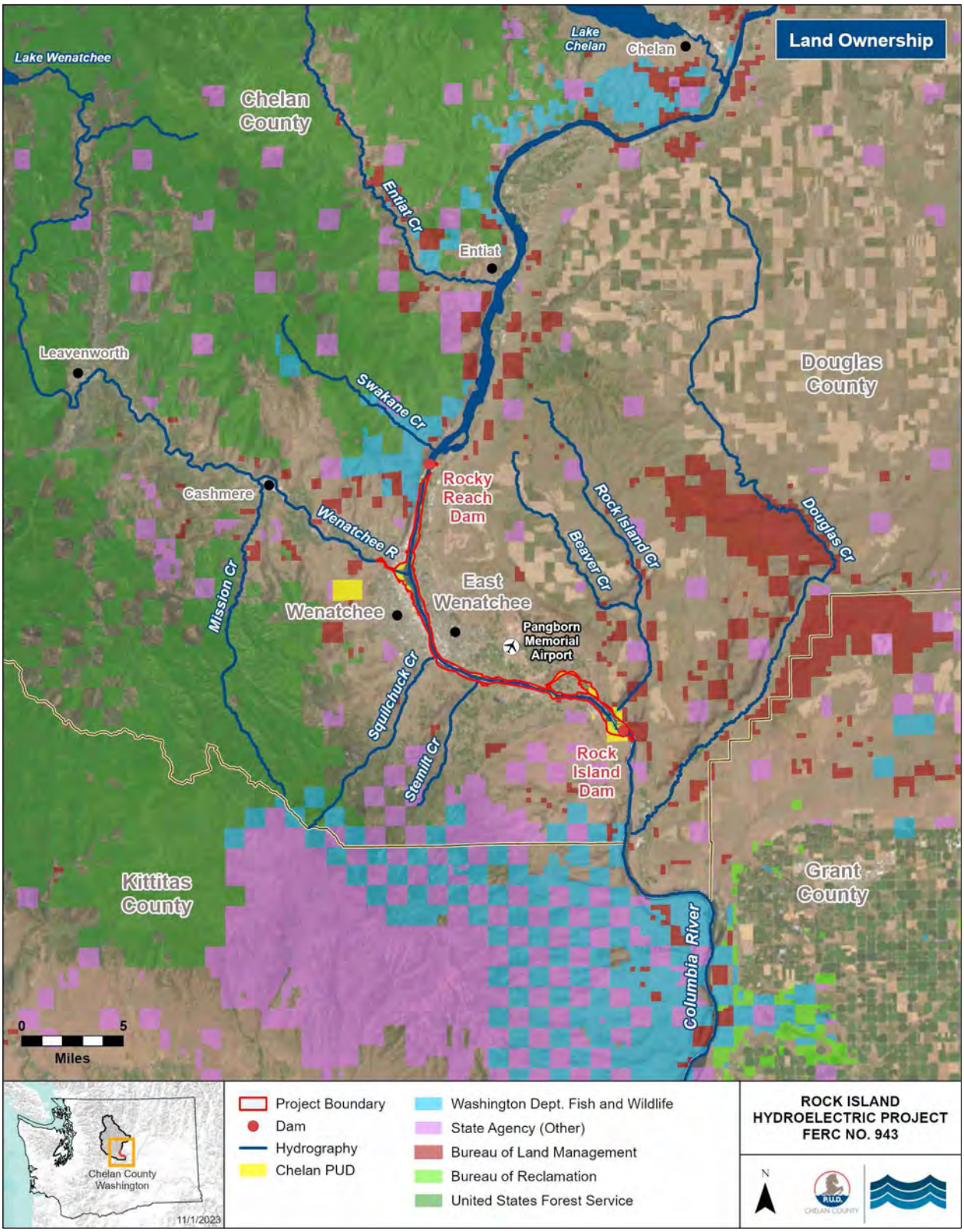

Figure 3.1-3 Greater Region of the Rock Island Hydroelectric Project

3.2 Subbasins

The Columbia River Basin encompasses 260,698 square miles, which the United States Geological Survey (USGS) has divided into three distinct hydrologic unit code (HUC) subbasins along the Columbia River: the Upper (river mile [RM] 1,202 to 324.5), Middle (RM 324.5 to 146), and Lower Columbia (RM 146 to 0) HUCs. The reach of river where the Rock Island Project is located falls within the Upper Columbia HUC (USGS 2020).

Additionally, the Columbia River Basin includes 14 other subbasins: the Clearwater, Deschutes, John Day, Kootenai, Lower Snake, Middle Snake-Boise, Middle Snake-Powder, Pend Oreille, Salmon, Snake Headwaters, Spokane, Upper Snake, Willamette, and Yakima (Figure 3.1-2 and Table 3.2-1).

Table 3.2-1 Drainage Areas of USGS Columbia River Subbasins

SUBBASIN	AREA IN SQUARE MILES*	STATES AND PROVINCES
Clearwater	9,397	Idaho, Montana, Washington
Deschutes	10,777	Oregon
John Day	7,954	Oregon
Kootenai	19,359**	British Columbia, Idaho, Montana
Lower Columbia	6,231	Oregon, Washington
Lower Snake	11,673	Idaho, Oregon, Washington
Middle Columbia	11,262	Oregon, Washington
Middle Snake-Boise	33,117	Idaho, Nevada, Oregon
Middle Snake-Powder	4,124	Idaho, Oregon
Pend Oreille	26,106**	British Columbia, Idaho, Montana, Washington
Salmon	14,037	Idaho, Montana
Snake Headwaters	5,756	Idaho, Wyoming
Spokane	6,584	Idaho, Montana, Washington
Upper Columbia	46,288**	British Columbia, Washington
Upper Snake	30,371	Idaho, Montana, Nevada, Utah, Wyoming
Willamette	11,509	Oregon
Yakima	6,153	Washington

Source: USGS 2020
*Square mileage is rounded
**These three subbasins include areas of British Columbia, Canada.

3.3 Climate

The Rock Island Project is located in the rain shadow of the Cascade Range and has arid to semi-arid climates, low precipitation, dry summers with warm to hot temperatures, and cold winters (NMFS 2002). Average precipitation in the entire Columbia River Basin is less than 20 inches (in.)

annually, with much of this occurring in the winter. Some marine influences occur in the alpine zones of the Cascades where as much as 40 to 140 in. of precipitation occurs, mostly as snow (NMFS 2002).

The city of Wenatchee has an average annual high temperature of 62.5°F, an average annual low temperature of 42.1°F, and receives an average of 9.1 in. of precipitation and 16.0 in. of snow fall annually (U.S. Climate Data, 2023).

3.4 Tributary Streams

The four largest tributaries of the Columbia River are the Kootenai, Pend Oreille, Snake, and Willamette rivers. The Rock Island Project is located on the Columbia River, approximately 235 RMs downstream of the Canadian border and 453 RMs upstream of the mouth of the river, where it meets the Pacific Ocean. The Wenatchee River joins the Columbia River approximately 15 RMs upstream from the Rock Island Dam at RM 470 and the lowermost one-mile reach of the Wenatchee River is within the Rock Island Project Boundary (Figure 3.4-1) (NWPCC 2004). Three other smaller tributaries enter the Columbia River between Rocky Reach and Rock Island Dams: Squilchuck Creek, Stemilt Creek, and Rock Island Creek (Figure 3.4-1). As currently licensed, the Rock Island Project Boundary also includes six waterbodies near the city of Rock Island (Figure 3.4-1) adjacent to the Columbia River, located north of the railway and Highway 28: Blue Heron Pond, Big Bow Pond, Hideaway Pond, Pit Pond, Putters Pond and Hammond Pond.

There are two USGS gages immediately adjacent to the Rock Island Project Boundary (shown in Figure 3.4-1):

- USGS Gage #12453700 (Columbia River at Rocky Reach Dam); and
- USGS Gage #12462600 (Columbia River below Rock Island Dam).

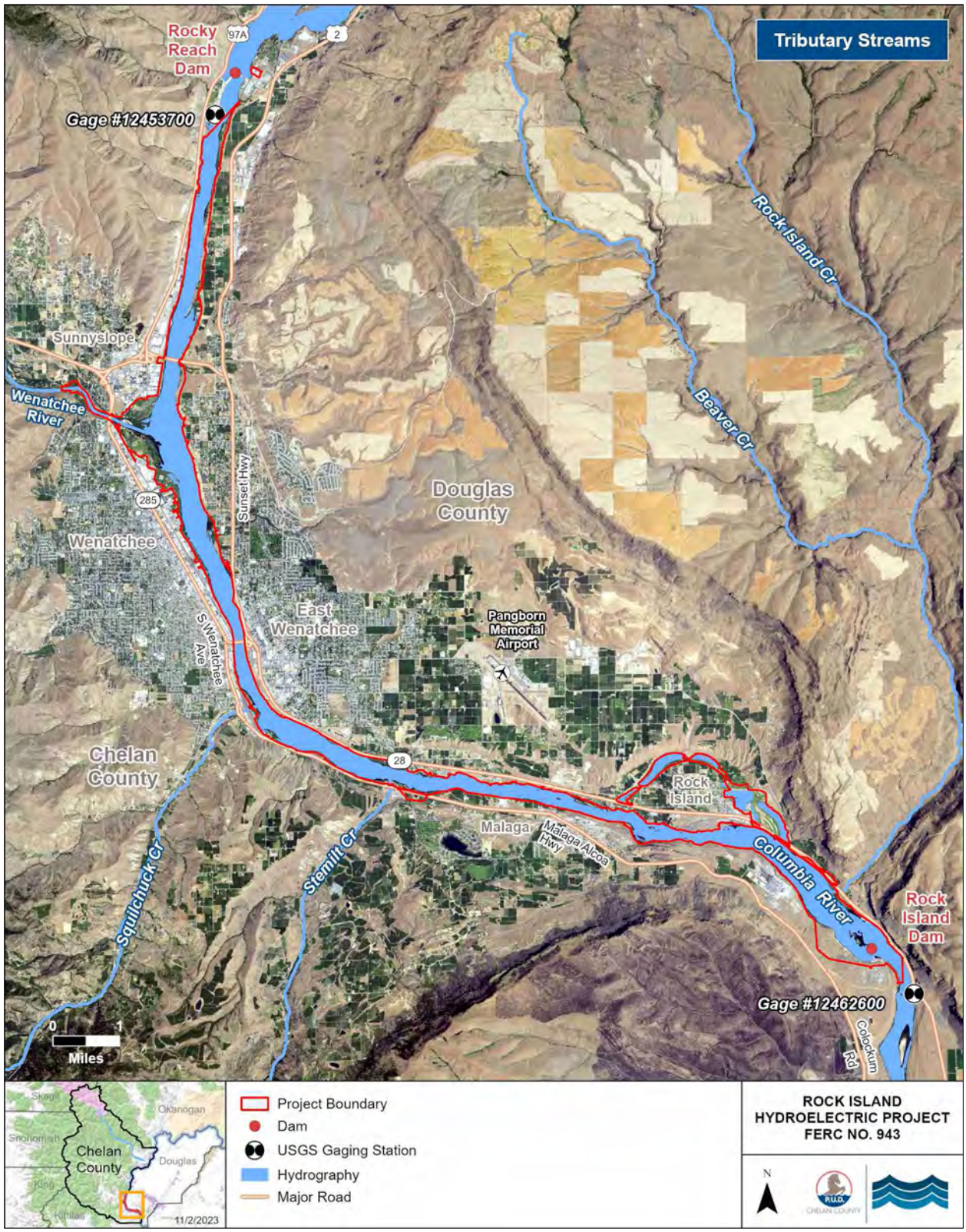

Figure 3.4-1 Tributary Rivers and Streams in the Area of the Rock Island Project

3.5 Other Dams and Diversions

The Columbia River Basin is home to many hydropower facilities consisting of federal, private, and public owners and operators. Dams along the Columbia River are used for flood control, power generation, navigation, recreation, municipal water supply and irrigation, industrial uses, and others (NWPCC 2023a). The scale of dams in the Columbia River Basin includes major dams, large dams, and smaller facilities.

There are hundreds of hydroelectric facilities in the Columbia River Basin (USACE 2012). On the mainstem Columbia River and its main tributary, the Snake River, there are 28 large hydropower dams (Figure 3.5-1) (USACE 2012). On the mainstem of the Columbia River there are 11 large dams in the United States, plus three Canadian dams (Table 3.5-1).

In the United States, the Upper Columbia subbasin includes seven dams (Figure 3.6-1): Grand Coulee, Chief Joseph, Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapids.

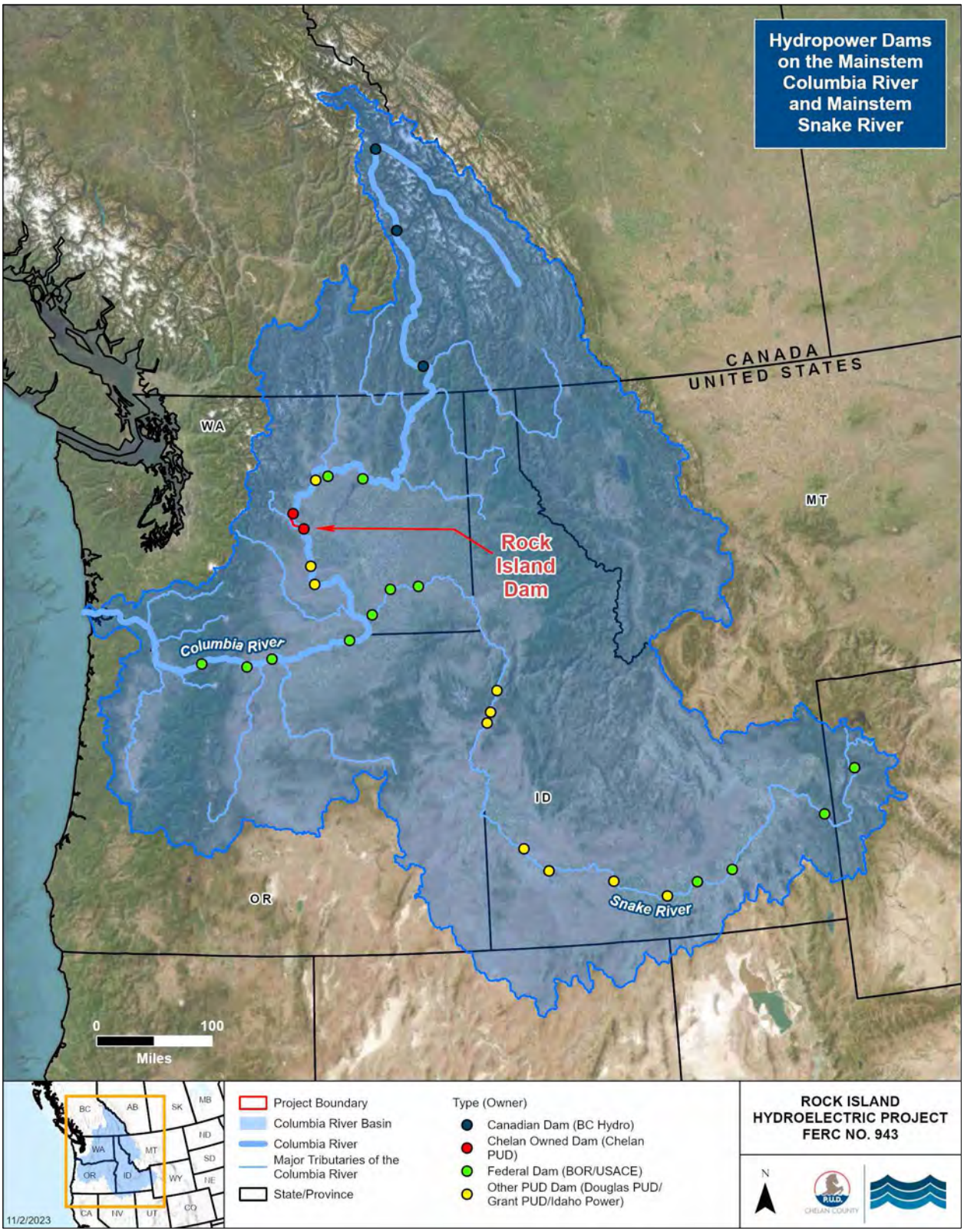

Figure 3.5-1 Hydropower Dam Facilities in Columbia River Basin

Table 3.5-1 Dams Located on Mainstem of Columbia River

NAME OF DAM	PROVINCE/STATE, COUNTRY	RIVER MILE (RM)	CAPACITY (MW)	OWNER
Mica Dam	British Columbia, Canada	956.0	1,805	BC Hydro
Revelstoke Dam	British Columbia, Canada	882.0	2,480	BC Hydro
Hugh Keenleyside Dam	British Columbia, Canada	770.0	185	BC Hydro
Grand Coulee Dam	Washington, United States	596.6	6,620	BOR
Chief Joseph Dam	Washington, United States	545.8	2,614	USACE
Wells Dam*	Washington, United States	515.1	774	Douglas PUD
Rocky Reach Dam*	Washington, United States	473.7	1,300	Chelan PUD
Rock Island Dam*	Washington, United States	453.4	629**	Chelan PUD
Wanapum Dam*	Washington, United States	415.8	1,038	Grant PUD
Priest Rapids Dam*	Washington, United States	397.1	956	Grant PUD
McNary Dam	Washington/Oregon, United States	292.0	991	USACE
John Day Dam	Washington/Oregon, United States	215.6	2,160	USACE
The Dalles Dam	Washington/Oregon, United States	191.5	1,807	USACE
Bonneville Dam	Washington/Oregon, United States	146.1	1,067	USACE

Sources: BC Hydro 2021; Columbia Basin Research n.d.; The Columbia Experience 2009; USACE 2012
*FERC-regulated dams defined as "major" hydropower facilities, i.e., dams that have a total installed capacity of more than 5 MWs.
**629 MW represents the Rock Island Project's installed full-gate capacity, consistent with other projects presented. The FERC best-gate capacity is 395.72 MW.

3.6 Major Water Uses

Water is withdrawn from the Columbia River and its tributaries at various locations for agricultural, domestic, municipal, and industrial supply. Water in the Columbia River Basin is also used to generate electricity, transport goods, and for recreation. Non-consumptive uses of water include instream flows for fish habitat and other aquatic resources. The Columbia River is managed for reliable flood control and for environmental and fisheries issues. The annual average runoff of the Columbia River Basin is approximately 198 million acre-feet (ac-ft) with average year-round flows of approximately 275,000 cubic feet per second (cfs). The total available water storage in the Columbia River Basin is approximately 55 million ac-ft (BPA et al. 2001). The following sections describe the historical and present uses of water in the Columbia River Basin, and within the Northwest Power and Conservation Council (NWPCC)-defined Upper-Middle Columbia subbasin[10] (Figure 3.6-1).

[10] Although the Rock Island Project is located within the USGS Upper Columbia subbasin, the NWPCC (2004) refers to this area as the "Middle-Upper Columbia subbasin."

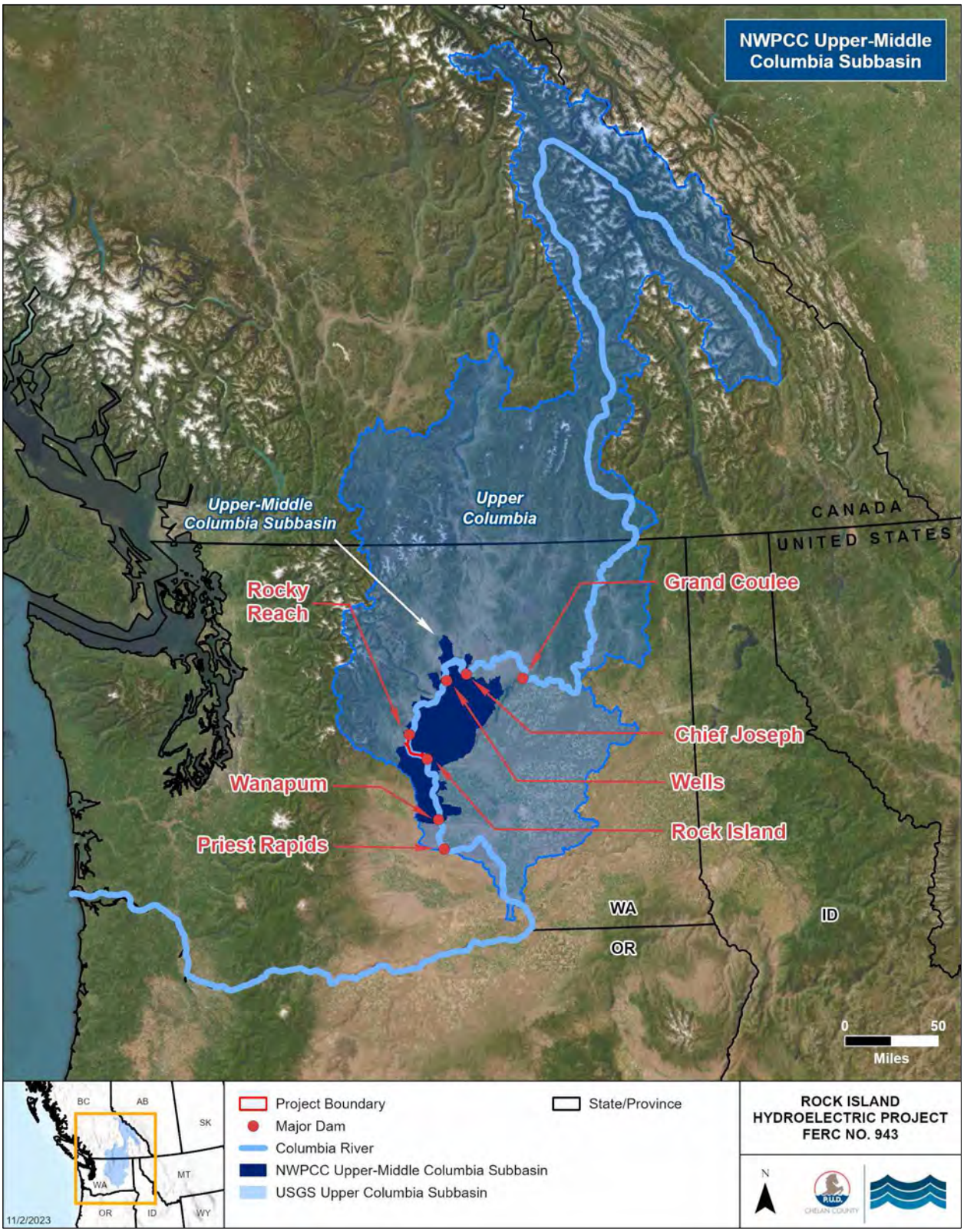

Figure 3.6-1 NWPCC Upper-Middle Columbia Subbasin and USGS Upper Columbia Subbasin

3.6.1 Agriculture

Approximately 6 percent of Columbia River water is diverted for agriculture (BPA et al. 2001). The largest areas of irrigated acreage are in southern Idaho, eastern Washington, and eastern Oregon (NWPCC 2023b).

Development of agriculture in the Columbia River Basin was fostered by construction of the Columbia Basin Project, an irrigation project developed by BOR and early farmers beginning in the 1940s. The Columbia Basin Project diverts water from behind Grand Coulee Dam to a series of reservoirs and canals and provides water to approximately 671,000 acres of farmland on the Columbia Plateau (NWPCC 2023c). Grand Coulee Dam is located upstream of Rock Island Dam at RM 596.6 (Table 3.5-1). Agriculture in the Upper-Middle Columbia subbasin (NWPCC 2004) is dominated by fruit tree orchards with apple, cherry, peach, and apricot, among others. These crops represent an economic mainstay in the region, and in the Rock Island Project area, Wenatchee is historically known for its abundant apple production (Photo 3-2). The primary fruit growing areas are along river valleys, where water from the Columbia River and its tributaries is available for irrigation (Chelan PUD 1999; NMFS 2002). Grain production and grazing are also prevalent, particularly in Douglas County (NMFS 2002).

Source: Wenatchee World 2018

Photo 3-2 Original Wenatchee Sign Illuminated on September 16, 1959

Further information on land use in the Rock Island Project area is discussed in Section 5.7 of this PAD.

3.6.2 Fish and Wildlife Habitat

Fish and wildlife are significant cultural, economic, and ecological resources in the Columbia River Basin.

Existing fish, wildlife, botanical, and aquatic resources in the Rock Island Project Boundary are provided in Sections 5.3 through 5.5.

3.6.3 Power Generation

Low-cost Columbia River hydropower is a cornerstone of the Pacific Northwest economy; Washington produces the most hydropower in the United States (Statista 2021). Affordable electricity helped spur the development of many northwest urban centers and attracted power-intensive industries such as aluminum manufacturing to the region, particularly during World War II (Lang 2021). More recently, companies such as Microsoft, Yahoo, and Dell built large data centers that rely on electricity produced by Mid-Columbia[11] dams (Hamann 2017).

Power from Rock Island Dam is delivered to major distribution points where it can be distributed to Chelan County customers. It is delivered to the Bonneville Power Administration (BPA) transmission grid, and to the Puget Sound area (Chelan PUD 2017). Further information of Rock Island Dam power generation and Rock Island Project operations are discussed in Section 4.3 of this PAD.

3.6.4 Recreation

The Columbia River, its tributary rivers and streams, and lakes in the Columbia River Basin attract a variety of recreational activities, including but not limited to wildlife viewers, boaters, sport anglers, swimmers, hunters, hikers, and campers throughout the year. Chelan PUD owns and manages 1,500 acres of land with public access, including approximately 400 acres of public parks. The Rock Island Project's FERC-approved recreation sites consist of Wenatchee Confluence State Park (including the Horan Natural Area [HNA]), Walla Walla Point Park, Wenatchee Riverfront Park, Kirby Billingsley Hydro Park, and the Coyote Dunes Natural Area. The development of the park system began in the 1980s and continued into the 1990s, with ongoing public-supported additions and improvements. The Rock Island Project now offers a diverse range of year-round recreational opportunities and reservoir access, including shoreline walking, nature viewing, cycling, sport fields, swimming, picnicking, boating, and camping.

In response to an amendment to the original license in 1974, Chelan PUD prepared a Recreation Plan for the Rock Island Project, proposing the development of six recreation sites along the shoreline. Some sites were not immediately developed, however FERC-approved additions and adjustments have been made over the years. The most recent addition is the Coyote Dunes Natural Area, which was approved by FERC in 2018 and developed for passive recreation. Chelan

[11] Although the Rock Island Project is located within the USGS Upper Columbia subbasin, it is commonly known as a "Mid-Columbia" (or Mid-C) project.

PUD intends to maintain the current level of services and amenities at these existing parks during the upcoming license term. Further information on recreation is provided in Section 5.6.

3.6.5 Flood Control

The Columbia River Basin has two principal flood seasons: the rain-produced flood season and the snowmelt flood season. Rain-fed floods occur most frequently on streams west of the Cascade Mountains, between November and March. Areas east of the Cascades, such as Douglas and Chelan counties, are primarily affected by snowmelt floods between May and July (BPA et al. 2001). A recent study from Oregon State University predicts a 20 to 40 percent increase in 10-year and 100-year floods over the next 50 years in two of the largest Columbia River tributaries, the Snake and Willamette Rivers (Queen et al. 2021). These future floods are expected to occur because of increased precipitation falling as rain instead of snow, due to changing meteorological patterns brought on by global climate change (Queen et al. 2021). Some of the largest floods in the Middle Columbia subbasin have been caused by rain-on-snow events (NMFS 2002).

Flood Probabilities Explained

Flood probabilities are based on the likelihood of a flood event of a certain magnitude occurring per year.

A 10-year flood has a 10 percent chance of occurring in any given year, while a 100-year flood has a 1 percent probability of occurring in any given year.

This means it is possible to have multiple 10, 100, or even 500-year floods within years or months of each other (BASIN 2005).

Flooding occurs throughout the Columbia River Basin, but damage potential is greatest in the lower Columbia River from the Portland-Vancouver area to the mouth of the river, due to influences from the Willamette River and snowmelt floods from the Columbia River, as well as the area's large urban population (BPA et al. 2001). In 1948, floodwaters inundated and destroyed the city of Vanport, located along the Columbia River, outside of Portland, Oregon. This devastating flood spurred treaty negotiations between the United States and Canadian governments to manage the Columbia River. The Columbia River Treaty (Treaty) was signed in 1961 to provide a framework for the United States and Canada to coordinate water storage, flood control and hydroelectric power generation in the Columbia River Basin (Ingram 2023). In fact, four hydroelectric projects, built as part of this Treaty, were designed with flood control and power generation operations as primary purposes (Government of Canada 2022; Lillis 2014; U.S. Department of State n.d.). Prior to the Treaty, Grand Coulee Dam was the only dam upriver of the Rock Island Project.

The maximum discharge of 692,600 cfs was recorded at Rock Island Dam on June 12, 1948. The flood of record, based on flood marks at Wenatchee, Washington, occurred on June 7, 1894, and

was estimated to have reached a peak discharge of 740,000 cfs. At Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapids dams, some or all the spill gates have dedicated automatic hoists to accommodate sudden storm, flood, or load rejection events in accordance with FERC requirements (NMFS 2002). In the event these hoists are needed, operators can operate the gates remotely from the control room.

Further information of the Rock Island Project hydrology and operations is provided in Section 5.2.3 and Section 4.5 of this PAD.

3.6.6 Navigation

Prior to the construction of dams on the Columbia River and its tributaries, river travel was difficult and dangerous, requiring portages around the numerous waterfalls and rapids. Remarking in his journal about the rapids at the present-day Cascade Locks, Corps of Discovery leader William Clark wrote that the "*water was passing with great velocity forming and boiling in a most horriable [sic] manner*" (Fifer 1998). Today, river traffic on the Columbia River can safely reach as far inland as Lewiston, Idaho, using the system of locks and reservoirs on the Columbia and Snake rivers (BPA et al. 2001).

The Mid-Columbia[12] River is not a navigational shipping corridor (NMFS 2002). There are no locks, ports, harbors, or smaller navigational channels that provide commercial boat passage above Priest Rapids Dam, 56 miles downstream of the Rock Island Project. Consequently, boat use is restricted to recreational users between Priest Rapids Dam (RM 397.1) and Grand Coulee Dam (RM 596.6) (National Oceanic and Atmospheric Administration [NOAA] n.d.).

3.6.7 Water Supply

Numerous municipalities and industries rely on water supplied from the Columbia River (BPA et al. 2001). The Eastbank Aquifer, located in Douglas County, is the primary source of drinking water for the greater Wenatchee area. The aquifer is continuously recharged by the Columbia River and supplies an average of 10.5 million gallons per day (City of Wenatchee 2021). The Rock Island Project area water use is discussed further in Section 5.2 of this document.

[12] Although the Rock Island Project is located within the USGS Upper Columbia subbasin, it is commonly known as a "Mid-Columbia" (Mid-C) project. Many reference documents such as the 2002 EIS (NMFS) refers to the general area as the "Mid-Columbia."

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4.0 PROJECT LOCATION, DESCRIPTION, FACILITIES, AND SPECIFICATIONS

4.1 Contact Information for Authorized Agent for Applicant

The following persons are authorized to act as an agent for the applicant pursuant to 18 CFR § 5.6 (d)(2)(i):

Kirk Hudson, General Manager
Public Utility District No. 1 of Chelan County
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Justin Erickson, Chief Strategy & Stakeholder Officer
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Janel Ulrich, Hydro Licensing Manager
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Janel.Ulrich@chelanpud.org
509-661-4400

4.2 Project Location

The Rock Island Project is located in central Washington, on the Columbia River near Wenatchee, Washington between Chelan County and Douglas County on the Columbia River at RM 453.4 (NMFS 2002) and is owned and operated by Chelan PUD. The Rock Island Reservoir has a surface area of approximately 3,522 acres from Rock Island Dam upstream to just below the Rocky Reach Project (also owned and operated by Chelan PUD) (NHC 2023).

Throughout this document, the term Rock Island Project Boundary is used to describe the FERC-designated geographic extent of the Rock Island Project, which encompasses 7.73 square miles (4,944 acres) of land, as well as the Rock Island Reservoir, and 9.83 acres of federally owned lands

administered by the BLM. The Rock Island Project Boundary is depicted in Figure 3.1-1. Figure 3.1-3 depicts the greater region around the Rock Island Project Boundary.

4.2.1 Detailed Project Maps

As required per 18 CFR § 5.6(3)(d)(2)(ii), detailed project maps are included in Appendix C of this document. As noted above, the Rock Island Project Boundary encompasses 9.83 acres of federally owned lands administered by the BLM (Figure 3.1-1) (Chelan PUD 2023a). Table 4.2-1 outlines the federally owned land acreage and legal descriptions of each parcel.

Table 4.2-1 Lands of the United States within Rock Island Project Boundary

COUNTY	PARCEL NO.	ACRES WITHIN THE ROCK ISLAND PROJECT BOUNDARY	LEGAL DESCRIPTION
Douglas	21220400000	3.25 acres	That part of Government Lot 4, Section 4, Township 21 North, Range 22 East, Willamette Meridian, Douglas County Washington lying southeasterly of the Rock Island Project Boundary as depicted on Exhibit G-1 of the Rock Island Project under the FERC Project 943 as approved on April 22, 2009.
Chelan	212204000000	5.53 acres	That part of Government Lot 7, Section 4, Township 21 North, Range 22 East, Willamette Meridian, Chelan County Washington lying northeasterly of the Rock Island Project Boundary as depicted on Exhibit G-2 of the Rock Island Project under the FERC Project 943 as approved on April 22, 2009.
Chelan	222126430000	1.05 acres	That part of Government Lot 7, Section 26, Township 22 North, Range 21 East, Willamette Meridian, Chelan County Washington lying northerly of the Rock Island Project Boundary as depicted on Exhibit G-6 of the Rock Island Project under the FERC Project 943 as approved on April 22, 2009.

Source: Chelan PUD 2023a

4.3 Habitat Conservation Plan

Chelan PUD and tribal, state, and federal fisheries managers executed the Rock Island and Rocky Reach Anadromous Fish Agreements and HCPs in 2002. The HCP Parties are Chelan PUD, USFWS, NMFS, WDFW, CTCR, and the Yakama Nation. The HCPs are unique 50-year contractual agreements and regulatory documents that (1) resolved the Mid-Columbia proceedings on

anadromous fish issues before FERC,[13] (2) provided the basis for ESA Section 10 permits to be issued to Chelan PUD by NMFS for operation of the Rocky Reach and Rock Island Hydroelectric projects (projects), and (3) formed the basis for the HCP Parties' recommended protection, mitigation and enhancement (PM&E) measures for relicensing the Rocky Reach Project in 2009 and for the current Rock Island Project relicensing. Only three hydropower HCPs exist in the nation: one each for Rock Island and Rocky Reach projects and one upstream for the Public Utility District No. 1 of Douglas County (Douglas PUD) Wells Hydroelectric Project FERC No. 2149. Chelan PUD's implementation of the HCP influences how the Rock Island Project is modified, operated, and maintained. Examples of such actions, including Chelan PUD's operation of spill gates and notched gates, are described in subsequent sections.

The Rock Island HCP commits Chelan PUD to achieving and maintaining a "No Net Impact" (NNI) performance standard for anadromous fish species (spring and summer/fall Chinook Salmon [*Oncorhynchus tshawytscha*], Sockeye Salmon [*Oncorhynchus nerka*], Coho Salmon [*Oncorhynchus kisutch*], and steelhead [*Oncorhynchus mykiss*]) migrating through the Rock Island Project (referred to as Plan Species). The NNI standard goes above the "no jeopardy" standard required under Section 7 of the ESA for federal actions in order to minimize and mitigate Rock Island Project impacts to the maximum extent practicable. Requirements of the HCPs include fish passage survival standards, hatchery supplementation funding, and habitat enhancement investments. The HCP constitutes a comprehensive and long-term adaptive management plan for Plan Species and their habitat as affected by the Rock Island Project, as well as provide clear accountability and expectations agreed to by the HCP Parties. The HCP defines NNI for the Plan Species as:

- Ninety-one percent combined adult and juvenile project survival for downstream passage through turbine, bypass, and/or spillway passage routes achieved by project improvement measures implemented within the geographic boundaries of the Rock Island Project (the Passage Survival Plans); and
- Nine percent compensation for unavoidable project mortality provided through hatchery (Hatchery Compensation Plans) and tributary (Tributary Conservation Plans) programs with 7 percent compensation provided through hatchery and 2 percent compensation provided through tributary programs.

The HCP Parties work through three committees, each comprised of representatives from each HCP Party, to reach consensus on issues regarding implementation of the Passage Survival Plans

[13] A summary of the mid-Columbia proceedings can be found in FERC's Master Order approving the HCPs. *See* FERC, Order Granting Interventions; Approving Anadromous Fish Agreements, Settlement Agreement, and Applications to Amend License; and Terminating Proceeding, 107 FERC ¶ 61,280 at 3-5 (June 21, 2004).

(HCP Coordinating Committee), Hatchery Compensation Plans (Hatchery Committee), and Tributary Conservation Plans (Tributary Committee). Each of the HCP Committees has met on average at least once per month since signing the HCPs in 2002 and each year the HCP Committees review and approve an Annual Report submitted to FERC that details Chelan PUD's compliance with the HCP, describing work undertaken by the HCP Parties to assess projects survival, projects operations and improvements; hatchery planning, implementation, maintenance, and improvements; and tributary plans and fiscal management.

Since execution of the HCP, the HCP Parties have demonstrated a strong record of collaboration on challenging issues, and the HCP has provided a successful framework that fosters dialogue and provides opportunities to adaptively manage complex resource issues.

4.3.1 Passage Survival Plans

The HCP's Passage Survival Plans require the implementation of juvenile measures, adult measures, and predator control activities with the primary objective of achieving specific survival standards for each Plan Species. The Passage Survival Plans use an integrated decision matrix process and phase designation system for implementing survival standards (see HCP at 5.1 Survival Standard Decision Matrix). The HCP survival standards apply to Plan Species actively migrating through the Rock Island Reservoir, forebay, dam, and tailrace in the mainstem Columbia River and do not include mortality unrelated to the projects, such as ocean or tributary mortality.

The HCP provides a detailed phase designation system (Phase I to III described in Section 5.3 of the HCP) for planning, testing, and confirming progress towards and achievement of passage survival standards. The ultimate objective is to reach Phase III Standard Achieved, which indicates that either (1) the 91 percent Combined Adult and Juvenile Survival Standard, or (2) the 93 percent Juvenile Project Survival Standard is being achieved. Once the respective standard has been met, Chelan PUD is required to re-evaluate survival using a representative species every 10 years.

Studies conducted under the Passage Survival Plan employ state-of-the-art scientific methods approved by the HCP Coordinating Committee. Valid studies require that testing occurs under representative flow conditions and Rock Island Project operations, with study design criteria evaluated and unanimously approved by the HCP Coordinating Committee. Individual studies are required to measure survival at a 95 percent confidence level, with a standard error of the estimate within ± 2.5 percent. The arithmetic mean of three valid survival estimates is used to compare against the pertinent survival standard, unless otherwise approved by the HCP Coordinating Committee. The HCP also recognizes that the inability to measure a standard due to the limitations of technology will not be construed as a success or failure to achieve NNI (Chelan PUD 2002, Section 3.1).

4.3.2 Hatchery Compensation Plans

The Rock Island HCP requires hatchery compensation for all Plan Species to address unavoidable mortality at the Rock Island Project. Implementation of the hatchery program is consistent with the overall objectives of rebuilding natural populations and achieving NNI as well as supporting harvest. The requirement for a unanimous vote to approve hatchery plan decisions and actions ensures that each objective is met, and that the HCP Parties' interests and regulatory obligations are reflected in the implementation of the plans.

Chelan PUD provides hatchery funding and capacity to meet the compensation levels necessary to achieve NNI for all Plan Species. Hatchery compensation for Plan Species is implemented in accordance with Section 8 of the HCP, under which the Hatchery Committee approves Hatchery Genetic Management Plans and ESA Section 10 permits related to hatchery operations and broodstock collection, respectively. The HCP allows Chelan PUD to enter into agreements with other entities for the rearing, release, and monitoring and evaluation of hatchery fish.

Upon execution of the HCP, initial estimated hatchery production levels were based on average adult returns of Plan Species for a baseline period, a 7 percent compensation requirement, and baseline adult-to-smolt survival rates for existing Mid-Columbia River hatcheries. The HCP allows the HCP Hatchery Committee to adjust hatchery production levels every 10 years thereafter, beginning in 2013. Adjustments are intended to account for changes in average adult returns, adult-to-smolt survival, and smolt-to-adult survival from hatchery production facilities.

4.3.3 Tributary Conservation Plan

The HCP's Tributary Conservation Plan establishes a Plan Species Account to fund projects for the protection and restoration of tributary habitat within the Columbia River watershed from the Chief Joseph tailrace to the Rock Island tailrace (including the Okanogan, Methow, Entiat, and Wenatchee river subbasins). The projects are intended to compensate for up to 2 percent of Unavoidable Project Mortality of Plan Species. The Tributary Committee is responsible for selecting projects from project applicants and approving project budgets from the Plan Species Account for purposes of implementing the Tributary Conservation Plan.

4.3.4 Achievement of Standards

In 2023, Chelan PUD released its second comprehensive progress report pursuant to Section 4.8 of the HCP detailing the continued achievement of Rock Island fish passage survival standards, hatchery supplementation requirements, and tributary enhancement commitments (2023 Report). The first comprehensive report in 2013 also detailed successful achievement of the NNI standards. In the last 20 years, the Rock Island and Rocky Reach Coordinating Committees have

provided oversight and approval of infrastructure and operational changes at the projects and in both project areas to increase survival of migrating salmon and steelhead. Chelan PUD has conducted over 30 survival studies to measure juvenile survival through the projects, and these collective efforts have led to Chelan PUD's achievement of Phase III Standards Achieved for Sockeye Salmon, steelhead, spring-migrating yearling Chinook Salmon, and Coho Salmon at both projects (see Section 4.3.1). Over this same period, the Hatchery Committees have guided the construction of hatchery capacity and implementation of conservation and harvest supplementation programs throughout the Wenatchee, Methow, and Okanagan Basins. Hatchery production will continue to occur according to the approved Hatchery Committee plans and in accordance with ongoing monitoring of the effectiveness of the hatchery programs (see Section 4.3.2). The Tributary Committees have managed the Plan Species Accounts, funding over 90 projects that contribute to rebuilding of tributary habitat production and capacity for Plan Species (see Section 4.3.3).

4.4 Description of all Existing and Proposed Project Facilities and Components

Rock Island Dam is a 3,580-foot-long reinforced concrete gravity structure, with a 1,184-foot-long gated spillway section containing 31 bays with vertical-lift crest gates (Table 4.4-1 and Figure 4.4-1). The structure includes two powerhouses with 18 generating units, and one station service unit, with a combined generating authorized capacity of 395.72 MW (Table 4.4-1) (Chelan PUD 2023a).

The dam comprises, from left abutment to right abutment: left bank retaining wall, left abutment gravity wall (a.k.a. left bank concrete gravity wall), left bank fishway, Powerhouse 1, spillway, middle fishway, Powerhouse 2, right bank fishway, and right abutment area (Figure 4.4-1) (Chelan PUD 2023a).[14] The development of the dam, Powerhouse 1 and four operating units (B1 through B4) began in 1930 and was completed in 1933, making it the first dam to span the Columbia River (Dougherty 2021). The addition of six units to Powerhouse 1 (B5 through B10) was completed in 1953. Located on the right bank of the river, Powerhouse 2 with eight bulb turbine generators (U1 through U8) was put into operation in 1979 (Chelan PUD 2023a).

[14] River left and river right refer to the left or right shorelines (respectively) of a river or stream as you navigate or are looking downstream.

Table 4.4-1 Rock Island Project Summary Data

ROCK ISLAND DAM CHARACTERISTICS	
FEATURE	**DESCRIPTION**
Location	Columbia RM 453.4 (USGS), approximately 12 miles downstream from Wenatchee, Washington
Primary Purpose	Power Generation
Hazard Classification	High
Type	Concrete Gravity
Height	110 ft
Crest Length	3,580 ft (approximate)
Spillway Crest Elevation	616 ft USGS (deck elevation), 620 ft USGS (parapet wall)
Spillway Size and Type	1,184 ft long with 31 gated spill bays with vertical-lift crest gates divided into east and west sections by a fish ladder that consumes a 32nd bay
Crest Width	Varies, approximately 30 ft minimum
Fish Passage	Three adult fishways with fish ladders, two juvenile bypass areas, and a juvenile fish trapping facility
ROCK ISLAND RESERVOIR FEATURES	
FEATURE	**DESCRIPTION**
Normal Maximum Headwater Level/Maximum Forebay Elevation	613 ft National Geodetic Vertical Datum 1929 (NGVD 29)
Drainage Area	89,400 square miles
Length	20.71 miles, RM 453.4 to 473.7 (USGS)[1]
Surface Area @ 613 ft headwater	3,521.7 acres
Average Width	1389 ft
Shoreline Perimeter	52.6 miles
Maximum Depth	213.7 ft
Average Flow (1973-2022)	113.67 kilo cubic feet per second (kcfs)
Usable Storage Capacity (609 ft headwater to 613 ft headwater)	12,189 acre-feet (ac-ft)
Gross Storage Capacity	126,312 ac-ft
Hydraulic Capacity	220,000 cubic feet per second (cfs)
Major Discharges	Power Production and Water Discharged over Spillway
POWERHOUSE 1: HYDRAULIC AND MECHANICAL FEATURES	
FEATURE	**DESCRIPTION**
STRUCTURE	
Type	Indoor, above-ground powerhouse with one station service unit
Construction	Reinforced cast-in-place concrete, structural frame for potential installation of two additional units
Approximate Size	870 ft long by 120 ft wide by 110 ft high

Features	Ten vertical axis generating units (B1 through B10) and a structural frame for the potential installation of two additional units
POWERHOUSE 1: TURBINE AND GENERATOR FEATURES	
FEATURE	**DESCRIPTION**
TURBINES	
Number of Units	11 (10 operating and one station service)
Type	Vertical-axis Kaplan, Nagler, and fixed pitch propeller
Installed (Best Gate) Capacity, Units B1 to B3	27,600 horsepower (hp) @ 45.0 ft head
Min/Max Hydraulic Capacity, Units B1 to B3	6.0 kcfs/6.8 kcfs
Installed (Best Gate) Capacity, Unit B4	27,067 hp @39.7 ft head
Min/Max Hydraulic Capacity, Unit B4	6.0 kcfs/6.8 kcfs
Installed (Best Gate) Capacity, Units B5 to B7, B9	19,140 hp @ 39.7 ft head
Min/Max Hydraulic Capacity, Units B5 to B7, B9	3.0 kcfs/7.9 kcfs
Installed (Best Gate) Capacity, Unit B8	24,000 hp @ 45.0 ft head
Min/Max Hydraulic Capacity, Unit B8	6.5 kcfs/8.5 kcfs
Installed (Best Gate) Capacity, Unit B10	18,800 hp @ 39.7 ft head
Min/Max Hydraulic Capacity, Unit B10	3.0 kcfs/8.3 kcfs
GENERATORS	
Type	Synchronous
Nameplate Capacity, station service unit (BHU)	1,750 kilovolt-ampere (kVA) at 13.8 kilovolt meters (kVm) 0.90 power factor (PF) and 100 revolutions per minute (rpm)
Nameplate Capacity, Units B1 to B4	23,000 kVA
Nameplate Capacity, Units B5 to B10	25,000 kVA
Unit BHU Power Factor	0.7
Unit B1 to B10 Power Factor	0.9
Speed, BHU	300 rpm
Speed, Units B1 to B10	100 rpm
Voltage, BHU	460 volt (V)
Voltage, B1 to B10	13.8 kilovolt (kV)
PRODUCTION	
Average Discharge (1992-2022)	113,970 cfs Total Hydro Project
Average Net Annual Generation (1992-2022)	2,556,952 megawatt-hours (MWh) Powerhouses 1 and 2 (Combined) – unit sum
POWERHOUSE 1: SWITCHGEAR FEATURES	
FEATURE	**DESCRIPTION**
MAIN TRANSFORMER	
Location	Powerhouse Upstream Deck
Type	13.2 kV to 115 kV, 3-phase
Ratings, Transformers 1 and 2 (Units B1 to B4)	72 mega volt-ampere (MVA)
Ratings, Transformers 3 and 4 (Units B8 to B10)	125 MVA

TRANSMISSION LINES	
Step-Up Transformers to Chelan County Riverbank	Four single-circuit 115-kV lines (~0.5 mile)
Transmission line junction to McKenzie Switchyard	Three single-circuit 115-kV lines (~1.5 miles)
POWERHOUSE 2: HYDRAULIC AND MECHANICAL FEATURES	
FEATURE	**DESCRIPTION**
STRUCTURE	
Type	Indoor, above-ground powerhouse
Construction	Reinforced cast-in-place concrete
Approximate Size	470 ft long by 230 ft wide by 135 ft high
Features	Eight horizontal-axis, bulb-type Kaplan generating units (U1 through U8)
POWERHOUSE 2: TURBINE AND GENERATOR FEATURES	
FEATURE	**DESCRIPTION**
TURBINES	
Number of Units	8
Type	Axial-flow, horizontal-axis hydro-turbines
Installed (Best Gate) Capacity, Units U1 to U8	37,300 hp @ 39.7 ft head
Min/Max Hydraulic Capacity, Units U1 to U8	3.0 kcfs/17.5 kcfs
Water Supply	Columbia River
GENERATORS	
Type	Synchronous
Nameplate Capacity, Units U1 to U8	54,000 kVA
Power Factor	0.95
Speed, Units U1 to U8	85.7 rpm
Voltage	6.9 kV
GOVERNOR	
Type	Electronic-Hydraulic
PRODUCTION	
Control Location	Local and Chelan PUD Dispatch Center
Average Discharge (1992-2022)	113,970 cfs Total Hydro Project
Average Net Annual Generation (1992-2022)	2,556,952 MWh Powerhouses 1 and 2 (Combined) – unit sum
POWERHOUSE 2: SWITCHGEAR FEATURES	
FEATURE	**DESCRIPTION**
MAIN TRANSFORMER	
Location	Powerhouse Deck
Type	Four step-up transformers connected to two single circuit 3-phase 6.5 kV to 115-kV transmission lines
Ratings, Units U1 to U8	108 MVA, feed electrical power to the 115-kV busses 1 and 2 through four step-up main transformers

TRANSMISSION LINES	
Step-Up Transformers to McKenzie/Valhalla	Two single-circuit 115-kV transmission lines (~2 miles

Sources: Chelan PUD 2023a; NHC 2023 (Appendix E.1); USGS 2023

[1] Reservoir length of 20.71 miles was derived from delineating the thalweg from 2021 bathymetric surveys while USGS river miles are based on mile markers found on USGS 7.5-minute quadrangle maps.

Figure 4.4-1 Rock Island Hydroelectric Project Works

4.4.1 Spillway

The Rock Island Dam is formed primarily by a gated, gravity-type spillway structure flanked by powerhouses on the left and right abutments. The spillway section is comprised of 31 gated spillways that are separated by the middle fish ladder, dividing the spillway into river left and river right portions (Figure 4.4-1 and Photo 4-1). The spillway consists of 13 deep bays and 18 shallow bays. Each bay is 30 ft wide and separated by 7-foot-wide concrete piers. The deep bays have an ogee crest elevation of 559 ft USGS and consist of two 22.5-foot-high gate sections and one 11-foot-high gate section. The shallow bays have an ogee crest elevation of 581.5 ft USGS and consist of one 22.5-foot-high gate section and one 11-foot-wide gate section. The spillway deck is at an approximate elevation of 616 ft USGS.

Nine notched spill gates were fabricated and installed between 1996 and 1997 to improve spill efficiency for juvenile fish passage. These gates, in spillways bays 1, 16, 18, 24, 26, 29, 30, 31, and 32, are small gates at the top of the larger gate that can be removed seasonally to allow juvenile fish passage.

In 2005 and 2007, Chelan PUD installed a modified, double set of gates, known as over/under gates, in spillway bays 30, 31, and 32 to reduce total dissolved gas (TDG) during spill operations. The over/under gates are comprised of two gates, one installed in each of the two gate slots in the spillway bay. The upstream gates, also called the "overflow" gates, were constructed to allow for shallow spill over the top of the spill gate and are equipped with notch gates (Figure 4.4-2). The downstream gate, also called the "underflow" gate, was constructed to allow the water to flow under the gate, entering the tailrace without plunging or entraining air (Figure 4.4-2) (Chelan PUD 2006). A summary of spillway attributes is noted in Table 4.4-2.

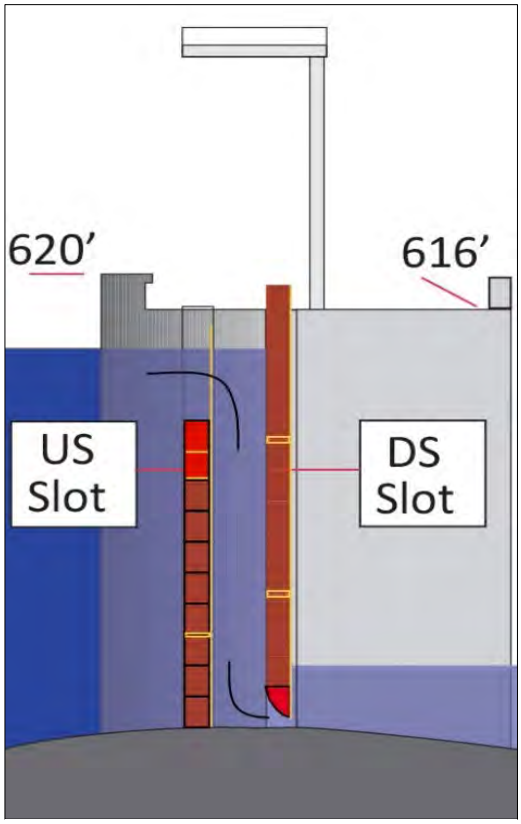


Figure 4.4-2 Upstream (US) and Downstream (DS)

Source: Kleinschmidt 2021

Photo 4-1 View of Rock Island Dam Showing Spillway Bays and Related Facilities

Table 4.4-2 Summary of Spillway Attributes

FEATURE	DESCRIPTION
Type	Controlled, Gated
Deck Crest Elevation	620 ft USGS
Ogee Crest Elevation	559 ft USGS (deep bay) and 581.5 ft USGS (shallow bay)
Crest Length	930 ft (30 ft wide by 31 bays)
Overall Length	1,184 ft total
Deep Gates	13 - 30 ft wide by 56 ft high gates
Shallow Gates	18 - 30 ft wide by 33.5 ft high gates
Fish Ladder	The middle fish ladder separates east and west spill bays
Gate Hoist Type	11 fixed-hoists and two gantry cranes
Gate Control Location	Local or remote from the control room
Discharge at Maximum Water Elevation	Approx. 821,000 cfs @ 613 ft NGVD 29 headwater elevation 1,225,000 cfs @ 628.5 ft NGVD 29 headwater elevation (Probable Maximum Flood)

Source: Chelan PUD 2023a

4.4.2 Powerhouse 1 Intakes, Tailrace Draft Tubes, and Mechanical Equipment

The intake for each Powerhouse 1 unit (B1 through B10) is divided into three intake chambers with a submerged entrance. Each chamber is equipped with a removable trash rack assembly that covers the area between the gate sill and the surface of the reservoir. Vertical trash rack bars are spaced 12 in. on center. The intake openings at the face of the dam for units B1 through B6 are 34 ft high by 15 ft wide. The intake openings for units B7 through B10 are 40 ft high by 15 ft wide. Two gate sections are required for closure of each bay, and six gate sections are required for closure of each unit.

The tailrace draft tube discharge section for each unit is divided into two openings by a draft tube pier. The draft tube openings for units B1 through B10 are 26.5 ft wide at the stop log slot and 16.6 ft high at the end of the draft tube. Each draft tube opening is provided with a slot for placement of two stop logs (four stop logs total per unit) for closure of the draft tube to dewater the unit.

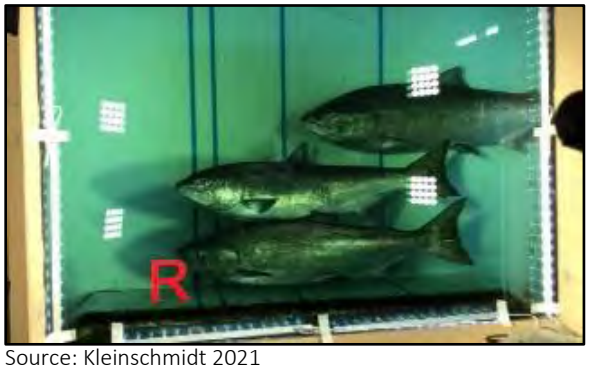
4.4.3 Powerhouse 2 Intakes, Tailrace Draft Tubes, and Mechanical Equipment

The intake of each Powerhouse 2 unit has two chambers, which are separated by an intermediate pier that extends downstream through the intake gate area and terminates just upstream of the generator bulb. The intake openings are furnished with face-mounted trash racks. The bars of each trash rack section form a grid comprised of 12 by 6 in. openings. Gate slots are provided downstream of the trash racks for the intake gates. Each intake gate is 22.5 ft wide by 12 ft high.

Each unit is provided with a draft tube gate for emergency closure of the water passages, for control of flow release following load rejection, and for dewatering purposes. The draft tube gates are approximately 37.5 ft wide by 35 ft high and close off a circular opening approximately 34 ft in diameter. Each draft tube gate is provided with an individual hydraulic operating system.

4.4.4 Adult Fish Passage Facilities

The Rock Island Project has three separate fish passage facilities, described below. All fishways have counting stations equipped with a viewing window and provisions for remote video recording (Photo 4-2). These fishways are operated consistent with the Operating Standards for Adult Passage Facilities included as an appendix to the HCP, as amended from time to time by the HCP Parties.



Source: Kleinschmidt 2021

Photo 4-2 Counting Station Window

4.4.4.1 Left-Bank Fishway

The left-bank fishway is located adjacent to the north abutment gravity wall, extends from the forebay reservoir downstream to the tailrace area of Powerhouse 1, and terminates near the drop gate structure. The main features of the fishway are the forebay exit structure, a counting station, a flow regulation section for controlling the quantity of flow down the ladder, a pool-type fish ladder with overflow weirs with orifices for conveying adult fish, water facilities (including the drop gate structure) for attracting adult fish from the tailrace area, and adult fish entrance structures.

The fishway was extended when the Rock Island Project headwater was raised from elevation 606.9 to 613.0 ft NGVD 29 in 1977. The upstream portion of the fishway was extended to include flow regulation pools and a counting room. Additionally, as part of Powerhouse 2 construction, modifications were made to existing structures and equipment to allow automatic and remote operation and to improve overall operation of the water attraction system (Chelan PUD 2023a).

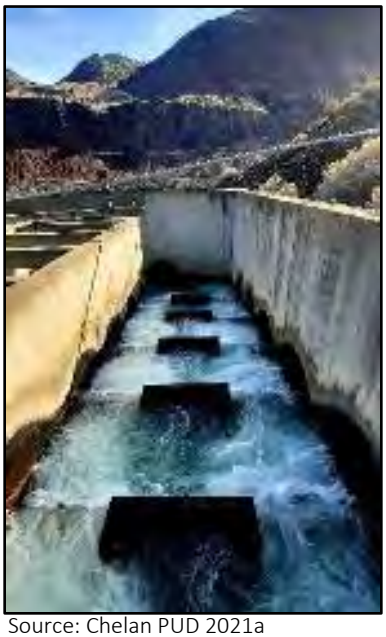
4.4.4.2 Middle Fishway

The middle fishway is located in bay 15 of the spillway and extends from the forebay reservoir downstream to the tailrace area. The middle fishway contains a forebay exit, flow regulation facilities for controlling the quantity of flow down the ladder, a counting station, a pool-type fish ladder with overflow weirs with orifices for conveying adult fish, water facilities for attracting adult fish from tailrace areas, and three adult fish entrances.

The upstream portion of the middle fishway was extended approximately 115 ft and the fish ladder wall was raised 7 ft when the Rock Island Project headwater elevation was raised from 606.9 to 613 ft NGVD 29 in 1977. The extension contains the make-up water diffusion chamber, flow regulation section, and exit structure including the counting station and counting room. Additionally, as part of Powerhouse 2 construction, modifications were made to existing structures and equipment to allow automatic and remote operation and to improve overall operation of the attraction water system (Chelan PUD 2023a).

4.4.4.3 Right-Bank Fishway

The right-bank fishway is located at the south end of Powerhouse 2 between the powerhouse and the right abutment (Photo 4-3). The upstream fishway structures include a forebay exit structure for counting and conveying adult fish from the ladder into the forebay, a flow regulation section for controlling the rate of water flows down the ladder, an adult fish ladder with overflow weirs and orifices, an attraction-water reservoir and channel, an attraction-water system that uses both gravity-fed water from the forebay and pumped water from the tailrace, and two adult fish-transportation channels flow through the upstream ladder is supplemented by pumping water into the water attraction reservoir from the tailrace. The flow to the attraction water reservoir is partially supplied by gravity flow through intakes provided at the forebay exit structure. The discharge of the flow to the tailwater is through five fish entrances where the flow is



Source: Chelan PUD 2021a

Photo 4-3 Right Fishway

regulated to obtain desirable velocities and flow conditions for fish attraction. The entire operation of the flow regulation system is automatically controlled by the plant computer and monitored by Chelan PUD staff.

4.4.5 Juvenile Bypass Trapping Facility

The Juvenile Bypass Trap is fed by two bypasses for juvenile fish. One bypass collects fish from the traveling water screens at the gravity flow intakes on the right-bank fishway and the other collects fish from a series of ports at the Powerhouse 2 intake gate slots into a bypass channel along the upstream face of the powerhouse structure. These juvenile fish are delivered to the fish trapping facility located adjacent to the right-bank fishway. Fish are released from the trapping facility through the fingerling bypass tailrace pipe (Chelan PUD 2023a).

4.4.6 Tailrace

The BLM owns approximately 8.8 acres of land in the tailrace (see Figure 3.1-1). Lands closest to the Rock Island Project are owned by Chelan PUD (see Section 5.7.2.1). On the Chelan County shoreline, or river right, the tailrace follows the Rock Island Project Boundary and extends from RM 453.4 to RM 452.6 (USGS) (approximately 3,000 ft downstream on river right) as measured from the face of the dam structure at Powerhouse 2. On the Douglas County shoreline, or river left, the tailrace extends to RM 453 (USGS), as measured from the left bank fishway structure, following the edge of the Rock Island Project Boundary (approximately 3,000 ft downstream on river left). The tailrace area is approximately 86 acres. The Wanapum Reservoir begins where the Rock Island Project's tailrace ends between RM 452.6 and RM 453 (USGS) (38 miles upstream from the Wanapum Dam [located at RM 416 USGS]) (Figure 4.4-1 and Table 3.5-1). The Wanapum Dam is owned and operated by Public Utility District No. 2 of Grant County (Grant PUD).

4.4.7 Transmission Lines

Power generation is transmitted over 115-kilovolt (kV) transmission lines to the McKenzie and Valhalla switchyards, located in Chelan County approximately 2 miles upstream of Rock Island Project (Figure 4.4-3). The transmission lines from the Rock Island Project powerhouses to the points of connection at the switchyards are the Rock Island Project's "primary" transmission lines. Each line terminates within the McKenzie and Valhalla switchyards. A single line diagram is provided as Appendix D.

Powerhouse 1 McKenzie transmission lines 1 to 4 begin at the north side of the Rock Island Project and head due west supported by transmission structures located in the Columbia River and on Rock Island approximately one-half mile prior to making landfall on the Chelan County side of the

river. Once on land, Powerhouse 1 transmission lines 1 and 2 are joined electrically into a single line and the three remaining lines head north to the McKenzie switchyard (Figure 4.4-3).

Powerhouse 2 McKenzie transmission line and Powerhouse 2 Valhalla transmission line travel south from Powerhouse 2 spanning a small section of the Columbia River to the Chelan County side. Once on land, the lines travel in a northerly direction to the McKenzie and Valhalla switchyards. Powerhouse 2 McKenzie transmission line connects to the McKenzie switchyard whereas the Powerhouse 2 Valhalla transmission line connects to the Valhalla switchyard (Figure 4.4-3).

4.4.8 Eastbank Hatchery

The Eastbank Hatchery is located within the Rock Island Project Boundary in Douglas County, just east of Rocky Reach Dam (Photo 4-4). The Eastbank Hatchery, built in 1989 by Chelan PUD, is Chelan PUD's main adult holding, spawning, incubation, and early rearing site for its hatchery programs to fulfill hatchery obligations under the Rock Island HCP; described in more detail in Section 4.3.

Source: Chelan PUD 2021a

Photo 4-4 Eastbank Fish Hatchery

4.4.9 Dependable Capacity

Based on the 30-year average from 1993 to 2022, the Rock Island Project produced approximately 213,542 MWh of electric energy annually. Dependable capacity of the Rock Island Project is 542 MW.[15]

[15] An estimate of Dependable Capacity and Average Annual Energy Production in kilowatt-hours (or a mechanical equivalent) is supported using the following data: the minimum, mean, and maximum recorded flows in cubic feet per second of the stream or other body of water at the power plant intake or point of diversion, with a specification of any adjustments made for evaporation, leakage, minimum flow releases (including duration of releases), or other reductions in available flow; OR a flow duration curve indicating the period of record and the gauging stations used in deriving the curve; and a specification of the period of critical stream flow used to determine the dependable capacity.

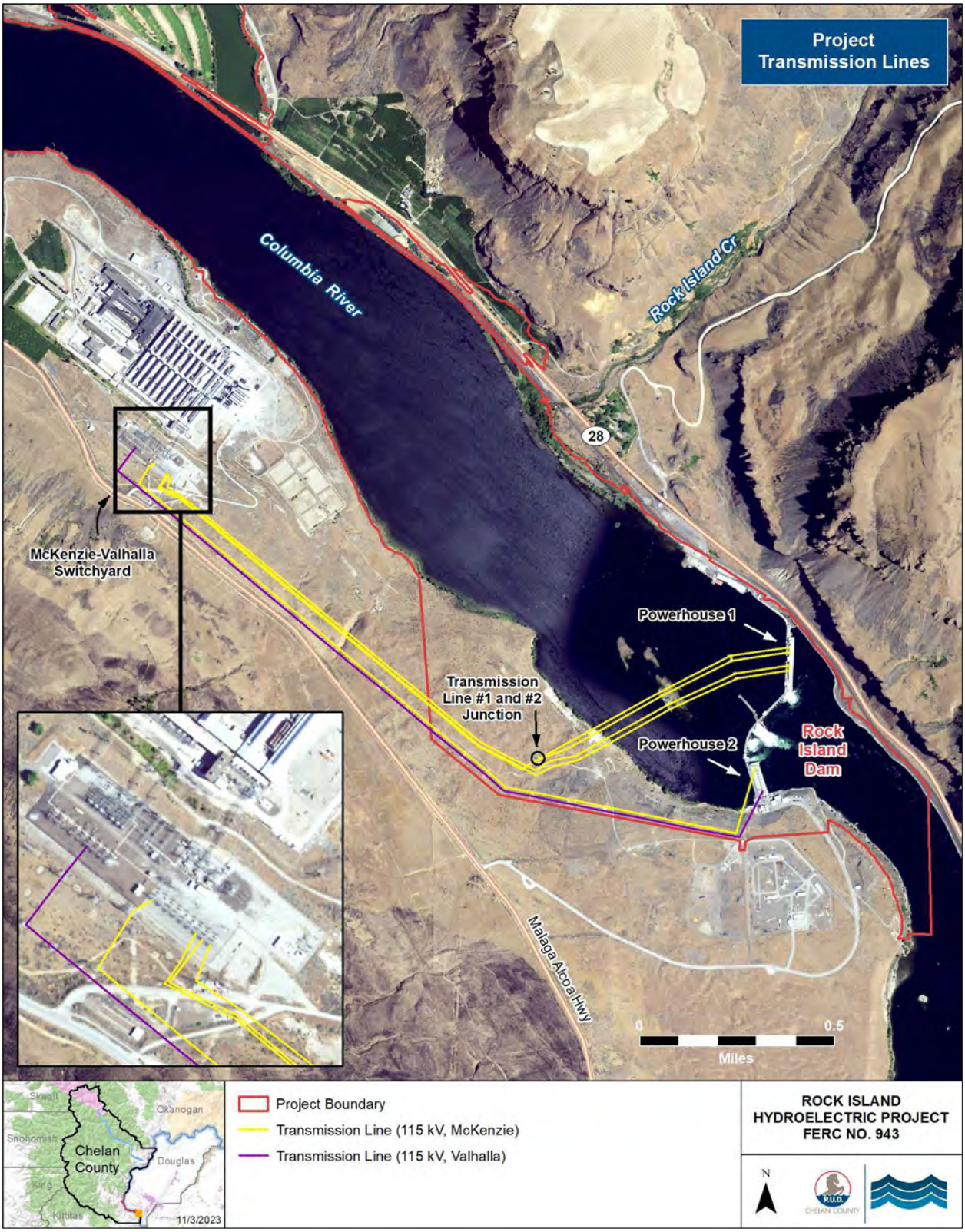


Figure 4.4-3 Rock Island Project Primary Transmission Lines and Switchyards

4.5 Project Operations

Chelan PUD operates the Rock Island Project to meet a variety of objectives such as generating electric energy, mitigating flood risk, maintaining water quality, facilitating fish passage, and fulfilling the obligations of the Hanford Reach Fall Chinook Protection Program Agreement (HRFCPPA).

Because Rocky Reach and Rock Island lack storage capacity, the operation of the Rock Island Project and the incoming flows are predominantly affected by operations at the upstream USACE Chief Joseph, BOR Grand Coulee, and Douglas PUD Wells projects. Chelan PUD maintains regular communication with the operators upstream to keep them informed of daily operations and planned schedules at the Rock Island Project. Due to its limited storage capacity, the Rock Island Project operates as a run-of-river project, aiming to match daily inflows with daily outflows.

Water storage at the Rock Island Project is minimal relative to the flows on the Columbia River and does not provide for the regulation of flows (Figure 4.5-1). Rather, daily water releases at the Rock Island Project are dependent on inflows. The combined hydraulic capacity for both Rock Island Project powerhouses is approximately 220,000 cfs. Rock Island Project power operations can be continued up to 440,000 cfs, which corresponds to peak outflow for a 100-year flood on the Columbia River. Headwater pool elevation can be maintained within a normal power operating range between 609 and 613 ft NGVD 29 during low and normal scenarios and flows that exceed generation and fish spill requirements are passed through the spillway.

Regarding flood control, during high inflow events additional spillway gates are opened as necessary and in accordance with the sequence described below, for purposes of reducing headpond elevation thereby increasing storage capacity. Lower headwater elevations are maintained when flows greater than 100-year flood levels occur.

To achieve upstream and downstream fish passage, flows are allocated to adult fishways, spill bays, and turbines. For juvenile fish passage, spill operations are comprised of 10 percent of the average estimated daily river flow in the spring, and 20 percent of the average daily flow in the summer. Beginning no later than April 17 of each year, daily spill volume is shaped to maximize the effectiveness of juvenile fish passage. Based on a large portion of juvenile fish passing Rock Island Dam through Powerhouse 2, gate deployment has been sequenced to favor using spill gates in between the middle fish ladder and Powerhouse 2. Operators utilize the following spill gate sequence to achieve mean daily spill targets: 32, 31, 30, 1, 26, 16, 18, 24, 29, 19, 20, 22, 27, 6, 7, and 8.

Figure 4.5-1 Columbia River Usable Storage

Regarding project coordination within the Mid-Columbia, from 1997 through June 30, 2017, Chelan PUD, Douglas PUD and Grant PUD participated in the Mid-Columbia Hourly Coordination Agreement (MCHCA); this agreement coordinated operations with upstream and downstream hydroelectric projects. Upon expiration of the MCHCA, Chelan PUD participated as a party to a Bridge Amendment to the MCHCA with Grant and Douglas PUDs until November 13, 2019. Since then, Chelan PUD has managed operations at the Rock Island Project through a set of modeling and operating tools designed to coordinate operations and system load shaping to ensure compliance with license obligations at the Rock Island Project's authorized operational ranges.

Chelan PUD's operations at Rock Island also consider the HRFCPPA, which was signed in 2004 among BPA, Grant PUD, Douglas PUD, and Chelan PUD. The HRFCPPA serves as the vehicle through which Chelan PUD contributes to the protection and enhancement of fall Chinook Salmon in the Hanford Reach of the Columbia River, located downstream of the Rock Island Project. Chelan PUD provides specific flows for each of the freshwater life stages of fall Chinook in the Hanford Reach, which have proven to be highly successful in protecting and enhancing this regionally important stock (Chelan PUD 2005).

4.5.1 Public Safety

As discussed in the Rock Island Project Public Safety Plan, filed most recently on May 30, 2023,[16] the Rock Island Project incorporates a variety of public safety measures pursuant to 18 CFR § 12.42 to protect the public in use of Rock Island Project lands and waters, as described in more detail below.

The Rock Island Project provides public safety warning devices such as warning signs (many printed in both English and Spanish), lights, and buoys. Public safety signs are located in proximity to the dam, powerhouses, and switchyard with warning signs located in Rock Island Project recreation sites, some reservoir access points, and the Eastbank Hatchery. All Rock Island Project driveways, walkways, parking lots, and work areas are illuminated to meet minimum requirements for visibility. Restraining devices at the Rock Island Project include boat barriers and booms, fences, gates, and key cards.

Buoys delineate designated recreation swim areas at all Rock Island Project recreation swimming area locations. Life rings have been placed every 200 ft along the intake, tailrace, and spillway decks. Each life ring station has 100 ft of rope and is contained in an enclosure (Chelan PUD 2023b).

[16] FERC Accession Number 20230530-5216.

The Rock Island Project works, the Eastbank Hatchery, and many of the recreation areas are surrounded by 6-foot-high or 8-foot-high cyclone fencing and locking gates, as applicable. Key-card access at gates and doors restricts access to the Rock Island Project generating facilities, switchyards, and substations (Chelan PUD 2023b).

Source: Chelan PUD 2021b

Photo 4-5 Public Tweet Announcing Construction at Kirby Billingsley Hydro Park Boat Launch

Chelan PUD provides current water levels, boat launch information, and a live camera of the Wenatchee Riverfront Park boat launch that is updated every 5 minutes on its website. Chelan PUD also developed a real-time water conditions app (*Current*) that allows users to check current reservoir levels, flows, and water temperature (Chelan PUD 2017b). Chelan PUD's communications staff are available around the clock and use a variety of methods to inform the public of outages and matters of public safety. Staff use social media tools such as X (formerly known as Twitter) (Photo 4-5) and Facebook to post notices and alerts that may be important to the media and the public. News releases, photos, and videos are posted on Chelan PUD's public website and shared with local radio stations and newspapers. Notices, an outage map, website information, and social postings are provided in English and Spanish.

4.6 Current License Requirements

FERC issued Chelan PUD a new 40-year license for the operation of the Rock Island Project on January 18, 1989 (FERC 1989). Articles have been added and revised since that license was issued nearly 35 years ago. Current license requirements are included in Appendix A.

4.6.1 Project Generation and Outflow Records

Monthly gross generation for Powerhouse 1 and Powerhouse 2 for the period of 2018 to 2022 is provided in Table 4.6-1. The 5-year average is 206,744 MWh. The 30-year average from 1993 to 2022 is 213,542 MWh (Table 4.6-1).

Table 4.6-1 Monthly and Yearly Average Gross Metered Switchyard Generation in MWh

MONTH	2018	2019	2020	2021	2022	5-YEAR AVERAGE	30-YEAR AVERAGE (1993-2022)
January	269,452.2	223,752.6	228,886.0	257,541.0	285,323.0	252,991.0	241,222.9
February	248,269.5	191,337.0	241,902.4	206,783.0	243,867.0	226,431.8	213,157.1
March	254,616.2	177,270.5	187,824.0	155,439.0	230,562.0	201,142.3	215,369.7
April	256,291.1	176,035.7	180,259.2	165,568.0	180,605.0	191,751.8	216,812.3
May	227,089.4	258,726.2	255,266.8	242,380.0	243,366.0	245,365.7	249,767.3
June	255,776.1	200,670.7	223,264.6	235,271.0	216,197.0	226,235.9	249,828.7
July	218,632.3	173,201.7	219,431.1	195,529.0	260,462.0	213,451.2	227,753.1
August	204,055.4	186,565.7	209,590.6	193,709.0	233,833.0	205,550.7	204,837.9
Sept.	147,972.2	128,347.4	153,675.8	134,947.0	155,796.0	144,147.7	152,436.1
October	156,857.3	137,609.2	159,316.9	136,347.0	136,198.0	145,265.7	164,605.4
Nov.	206,585.7	208,495.6	216,464.1	182,209.0	210,022.0	204,755.3	199,106.4
Dec.	206,547.4	195,700.7	224,572.0	277,045.0	215,348.0	223,842.6	227,611.6
Annual Avg.	204,166.4	173,825.5	192,497.9	183,445.3	201,046.2	206,744.3[1]	213,542.4[2]

Source: Chelan PUD 2022a

[1] The 5-year annual average is calculated using all monthly averages from 2018 to 2022.

[2] The 30-year annual average is calculated using all monthly averages from 1993 to 2022.

4.6.2 Current Net Investment

As of June 30,2023, Chelan PUD has incurred an original cost investment of $899.00M (including construction work in progress), accumulated depreciation of $342.27M, and a net book value of $556.73M for the Rock Island Project. Original cost investment and net book value should not be interpreted to be the fair market value of the Rock Island Project.

4.6.3 Compliance History

Chelan PUD has a strong culture of compliance at the Rock Island Project. Chelan PUD's four License Compliance Specialists and Hydro License Manager use compliance software, routinely attend conferences and training, and maintain a handbook of all business processes to support compliance with the terms and conditions of the FERC license, including the HCP, and applicable laws. To Chelan PUD's knowledge and based on a review of the FERC docket on FERC's eLibrary system, Chelan PUD identified two instances over the current license term in which Chelan PUD had not complied with license requirements. Both of these instances occurred over 25 years ago and involved instances in which Chelan PUD failed to submit a timely report to FERC staff. The robust business processes and implementation of compliance tracking software have helped ensure a strong compliance record over the past 25 years.

4.7 Proposed New Facilities and Future Development

At this time, Chelan PUD proposes no new facilities or additions or changes to existing Rock Island Project facilities.

Chelan PUD is proposing adjustments to the Rock Island Project Boundary. Chelan PUD proposes to add the lands under the primary transmission lines and lands associated with the Home Water Wildlife Preserve to the Rock Island Project Boundary, and to remove the Rock Island Ponds area from the Rock Island Project Boundary.

4.8 References

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5.0 EXISTING ENVIRONMENT

Pursuant to 18 CFR § 5.6(d)(3)(i), the PAD presents, based on existing, relevant, and reasonably available information, a discussion with respect to each resource area in the existing environment which contains:

A description of the existing environment as required by [18 CFR § 5.6(d)(3)(ii)-(xiii)]:

"Summaries (with references to sources of information or studies) of existing data or studies regarding the resource.

A description of any known or potential adverse impacts and issues associated with the construction, operation, or maintenance of the proposed project, including continuing and cumulative impacts.

A description of any existing or proposed project facilities or operations, and management activities undertaken for the purpose of protecting, mitigating impacts to, or enhancing resources affected by the project, including a statement of whether such measures are required by the project license, or were undertaken for other reasons. The type and amount of the information included in the discussion must be commensurate with the scope and level of resource impacts caused or potentially caused by the proposed project. Potential license applicants are encouraged to provide photographs or other visual aids, as appropriate, to supplement text, charts, and graphs included in the discussion."

Based on these requirements, the following resource areas will be discussed in this Section 5.0:

- Geology and Soils;
- Water Resources;
- Fish and Aquatic Resources, including Rare, Threatened, and Endangered (RTE) Species;
- Wildlife and Botanical Resources, including RTE Species;
- Wetlands, Riparian, and Littoral Habitat;
- Recreation Resources;
- Land Use;
- Aesthetic Resources;
- Cultural and Historic Resources;
- Tribal Resources;
- Socioeconomic Resources; and
- Environmental Justice.

5.1 Geology and Soils

As specified in 18 CFR § 5.6(d)(3)(ii), the following section describes the geology, topography, and soils based on readily available information in the region of the Rock Island Project:

- A description of the geologic features, including bedrock lithology, stratigraphy, structural and glacial features, unconsolidated deposits, and mineral resources.
- A description of the soils, including the types, occurrence, physical and chemical characteristics, erodibility, and potential for mass soil movement.
- A description of any associated reservoir shorelines and streambanks, including steepness, composition (bedrock and unconsolidated deposits), and vegetative cover; and existing erosion, mass soil movement, slumping, or other forms of instability—including identification of Rock Island Project facilities or operations that are known to or may cause these conditions.

5.1.1 Geologic Setting

The Rock Island Project is located along the Columbia River in a north-south trending valley directly east of the Wenatchee Mountains, a major subrange of the Cascade Mountains and part of the greater North Cascade Range. This portion of the Columbia River, and the Rock Island Project itself, straddles two physio-graphically distinct geologic provinces: the North Cascades Province, west of Rock Island Project, and the Columbia Basin Province, east of the Rock Island Project (WADNR 2021a).

The North Cascades Province, including the North Cascade Range and Okanogan Highlands to the west and north, are mainly composed of a complex mix of metamorphosed Tertiary rocks from multiple origins with some sedimentary rocks. The North Cascades Province is a section of the greater Cascade Range in the Pacific Northwest of the United States. The North Cascade Range extends 270 miles from north to south and is roughly 150-mile-wide from east to west. These mountains are a result of the Cascadia Subduction Zone creating uplift of mostly metamorphosed schists and gneisses, slightly metamorphosed marine sedimentary rocks, volcanic rocks, and granitic batholiths. The peaks of this mountain range average approximately 5,000 ft in elevation and reach elevations in excess of 10,000 ft (WADNR 2021b).

The Columbia Basin Province occupies the entire southcentral portion of Washington state, encompassing much of the Columbia River and its confluence with the Snake River, and continues through much of eastern Oregon and northern Nevada. The overall landscape of the province is expansive; arid lowlands characterized by incised river canyons and numerous plateaus. Most of

the lithologies found in the area are Quaternary to upper Tertiary in age, from sedimentation and glaciation that took place during prehistoric flooding events overlaying older, Columbia River Basalts (WADNR 2021b).

The Columbia Basin Province is comprised primarily of Upper Tertiary and Quaternary-Pliocene volcanics. These were created during the Miocene (17 to 6 million years ago) due to large-scale volcanic eruptions originating near the border of Washington, Oregon, and Idaho, covering an area of 87,000 square miles. Many of the Columbia River Basalts proximal to the Rock Island Project area were subsequently covered in glacial till from the last advance of the Cordilleran ice sheet approximately 12,000 years ago. Over time, the Columbia River incised through the glacial outwash to its current levels, forming terraces along the valley sides with debris and alluvial fans shifting the unconsolidated materials to downslope positions (WADNR 2021a).

Rock Island Dam was constructed on basalt and tuffaceous bedrock (Chelan PUD 2023). The Missoula flooding events (Section 5.1.2.2) deposited the Quaternary sediments expressed as terraces and channel banks. Sandy to gravelly alluvial deposits overlay these rock units are discussed in subsequent sections. Much of these Quaternary sedimentary deposits underlay the Rock Island Reservoir and form the channel banks (Foster 2008; Chelan PUD 2023).

5.1.1.1 Bedrock Lithology and Stratigraphy

As discussed above, the geology of the area is represented by the North Cascades and Columbia Basin provinces. The lithologies found in the Rock Island Project area are primarily Quaternary sediments originating from the North Cascades Range and Quaternary-Pliocene and Upper Tertiary sediments from Columbia River Basalt (WADNR 2016). Within one-half mile of the Rock Island Project, there are 13 primary lithologies (Table 5.1-1 and Figure 5.1-1).

The Rock Island Project is underlain by Pleistocene and Miocene aged lithologies. The east shore of the Rock Island Reservoir is bounded by the Grande Ronde Basalt which is characterized by invasive flows, Miocene sedimentary and volcanic rocks that are a part of the Columbia River Basalt Group. The area is comprised of a fine- to medium-grained, aphyric to sparsely plagioclase-phyric basalt, typically forming sills in sedimentary rocks. Locally this includes chaotic mixtures of basalt and sedimentary rocks (peperite), hyaloclastite, and pillowed lava flows (Tabor et al. 1982).

The west shore of the Rock Island Reservoir is bounded by unconsolidated Pleistocene sediments with origins from the North Cascades Range in a periglacial depositional environment, deposited by the series of outburst floods generated by failure of Pleistocene ice dams near Clark Fork, Idaho. These floods are known as the Missoula floods. These deposits are typically crudely stratified, poorly sorted deposits composed of angular to subrounded pebbles, cobbles, and boulders in a

sand and gravel matrix; clasts include a wide variety of rock types. Locally, this unit includes thin interbeds of silt and fine sand and thin, discontinuous layers of volcanic ash (WADNR 2021b).

Rock Island is a lithology of Miocene sedimentary and volcanic rocks that are part of the Columbia River Basalt Group. This lithology is categorized as part of the Grand Ronde Basalt flow with a difference in composition from the similarly sourced lithology to the north. This unit is described as dark-gray or black, fine-grained, aphyric to sparsely plagioclase-phyric basalt. Plagioclase phenocrysts are seen either as isolated crystals or as glomerophyric clots with clinopyroxene. Locally, it contains thin sedimentary interbeds and pillow-palagonite complexes (Swanson and Wright 1978).

Much of the remaining shoreline of the Rock Island Reservoir was formed from Quaternary unconsolidated sediments that were deposited either in non-glacial or periglacial environments (e.g., Qa, Qfg, and Qls), which are summarized in Table 5.1-1 and shown on Figure 5.1-1 (WADNR 2016).

Table 5.1-1 Bedrock Lithologies Within 0.5 Mile of the Rock Island Project

MAP UNIT LABEL	GEOLOGIC AGE	LITHOLOGY DESCRIPTION	DESCRIPTION	AREA (ACRES)	PERCENT
Ec(2)	Tertiary – Eocene	Middle and upper Eocene sedimentary and volcanic rocks	White or gray, medium- to coarse-grained, micaceous feldspathic sandstone, siltstone, and shale; minor conglomerate and rare crystal-lithic tuff.	462.0	2.14
Mv(g)	Tertiary – Miocene	Miocene sedimentary and volcanic rocks	Dark-gray or black, fine-grained, aphyric to sparsely plagioclase-phyric basalt; plagioclase phenocrysts either as isolated crystals or as glomerophyric clots with clinopyroxene; normal or reversed magnetic polarity.	410.3	1.90
Mvi(g)	Tertiary – Miocene	Miocene sedimentary and volcanic rocks	Fine- to medium-grained, aphyric to sparsely plagioclase-phyric basalt; forms sills in sedimentary rocks of unit Mc; locally includes chaotic mixtures of basalt and sedimentary rocks (peperite), hyaloclastite, and pillowed lava flows.	564.0	2.62
Oc	Tertiary – Oligocene	Oligocene sedimentary rocks	Micaceous quartzose sandstone, variegated tuffaceous shale, and conglomerate that is composed of clasts of felsic volcanic rocks and vein quartz; minor silicic tuff. Consists of the Wenatchee Formation.	23.6	0.11
pCgn	Precambrian	Precambrian metamorphic rocks, gneiss protolith unknown	Strongly foliated, fine- to medium-grained, biotite-oligoclase-quartz gneiss; rare hornblende schist, calc-silicate schist, and amphibolite; rare marble; locally mylonitic. Consists of the Swakane Biotite Gneiss (Now regarded as pre-Tertiary).	1,064.0	4.94
PLMls	Tertiary - Pliocene & Miocene	Pliocene and Miocene sedimentary rocks	Poorly sorted, angular granule- to boulder-size clasts derived from the Columbia River Basalt Group; locally deeply incised.	0.2	<0.01
Qa	Quaternary	Unconsolidated sediments, non-glacial alluvium	Silt, sand, and gravel on modern floodplains and alluvial fans; includes some older alluvial deposits that form narrow terraces adjacent to modern streams; locally includes loess, peat, lacustrine deposits, or volcanic ash.	2,510.5	11.65

MAP UNIT LABEL	GEOLOGIC AGE	LITHOLOGY DESCRIPTION	DESCRIPTION	AREA (ACRES)	PERCENT
Qad	Quaternary - Pleistocene	Unconsolidated sediments, alpine glacial drift deposits	Till, outwash, and minor glaciolacustrine sediments.	760.7	3.53
Qfg	Quaternary - Pleistocene	Unconsolidated sediments, periglacial, outburst flood deposits, gravel	Crudely stratified, poorly sorted deposits composed of angular to subrounded pebbles, cobbles, and boulders in a sand and gravel matrix; clasts include a wide variety of rock types; locally includes thin interbeds of silt and fine sand and thin, discontinuous layers of volcanic ash; deposited by outburst floods generated by failure of Pleistocene ice dams near Clark Fork, Idaho; flood gravels interbedded with glaciolacustrine deposits along the Columbia and Spokane rivers and their tributaries are shown as unit Qfg. Includes the gravel of Fancher Field. (Tabor et al. 1982).	10,590.7	49.17
Qfs	Quaternary - Pleistocene	Unconsolidated sediments, periglacial, outburst flood deposits, silt and sand	Rhythmically bedded and graded deposits of silt and sand; minor discontinuous lenses of sand and gravel; deposited in lakes created by the temporary ponding of glacial outburst floodwaters; locally interbedded with unit Qfg.	168.9	0.78
Qls	Quaternary	Unconsolidated sediments, non-glacial mass-wasting deposits	Landslide deposits, talus, and colluvium composed of unsorted debris derived from either Quaternary sediments or bedrock; locally includes rotated blocks of competent sediments or bedrock; along the southern flank of the Beezley Hills (T21N R24-25E), chiefly colluvium composed of angular to subrounded basalt fragments.	1,006.6	4.67
Qoa	Quaternary	Unconsolidated sediments, non-glacial older alluvium	Weakly consolidated sand and gravel that form terraces above the modern floodplain of the Wenatchee River (T22-23N R19-21E) and alluvial fans west of Soap Lake (T22N R25E); surfaces of the alluvial fans dissected and capped by caliche.	492.5	2.29
wtr	Present		Bodies of fresh or salt water.	3,487.0	16.19

Source: WADNR 2016

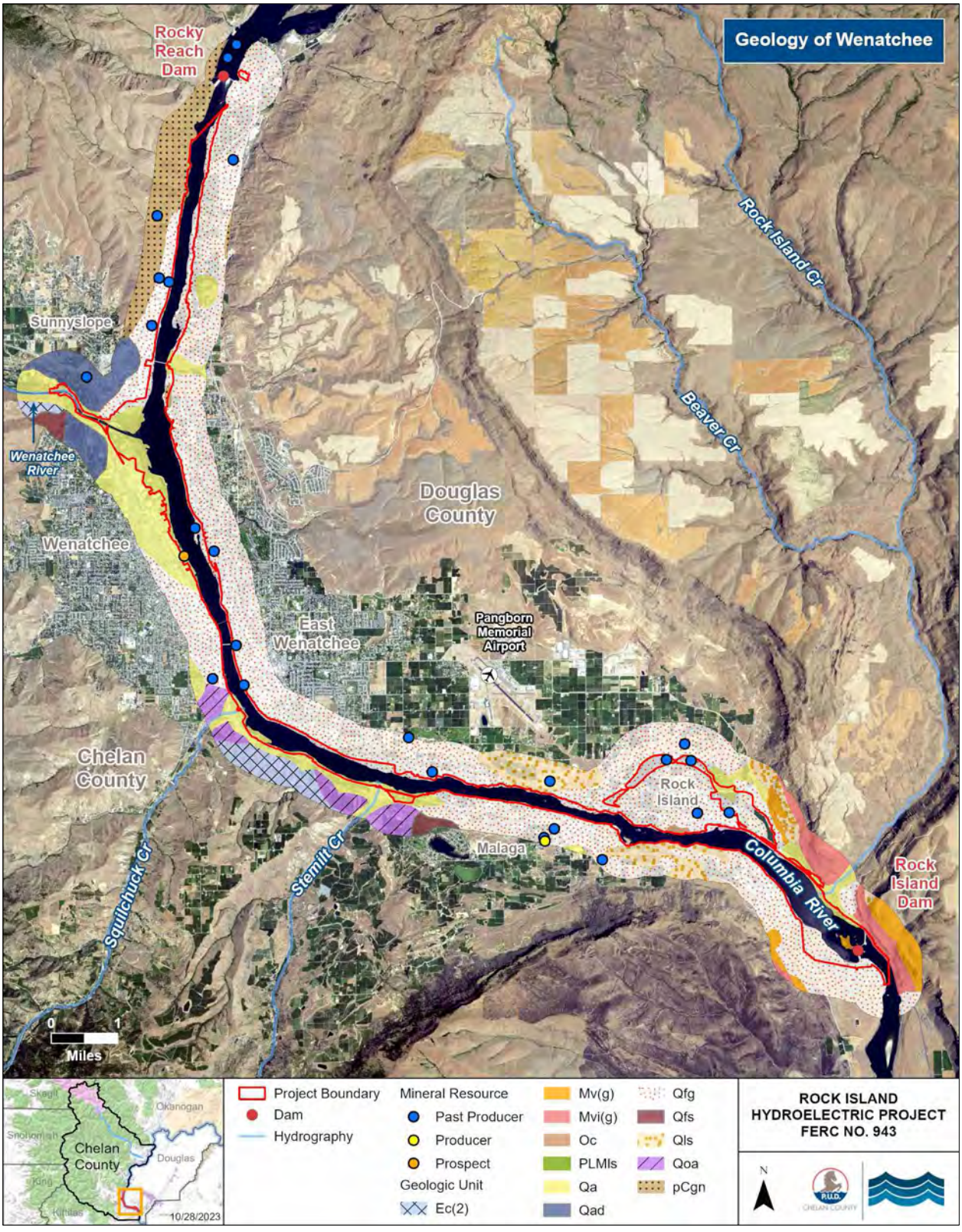

Figure 5.1-1 Bedrock Lithologies Within 0.5 Mile of the Rock Island Project

5.1.2 Tectonic History

The Cascadia Subduction Zone is a megathrust, 600-mile fault running from northern California into British Columbia, approximately 80 miles off the Pacific coast. This fault demarks a separation of the Juan de Fuca and North American tectonic plates. At this boundary, the Juan de Fuca plate is subducted underneath the North American plate. As the plate is subducted, the continental plates to the east become compressed (Oregon Office of Emergency Management 2021). This subduction zone gives rise to the prevalent volcanism found in the region as the Juan de Fuca plate is sufficiently subducted, melts, and rises to the surface.

The Yakima Fold and Thrust belts west and south of the Rock Island Project area are a series of folds and faults resulting from regional compression of Washington along the Cascadia Subduction Zone (Figure 5.1-2). Shortening and uplift along the Yakima folds and associated faults are responsible for the topography seen today, including the Ahtanum, Umtanum, Manastash, Toppenish and Yakima ridges. These structures vary in elevation from 1,000 to 3,500 ft (Kelsey et al. 2017). The Rock Island Project is situated along the hanging wall of the Manastash frontal thrust fault, known as the Manastash Anticline. The Manastash Anticline is part of the back arc deformation from the Cascadia Subduction Zone. Deformation of the Manastash Anticline is accommodated by two sets of primary faults, a west-northwest-striking frontal thrust fault and north-northeast-striking fault (Kelsey et al. 2017). The crustal faulting that is observed surrounding the Rock Island Project was caused by the rupture of faults within the North American plate. These crustal faults are typically shallow in nature.

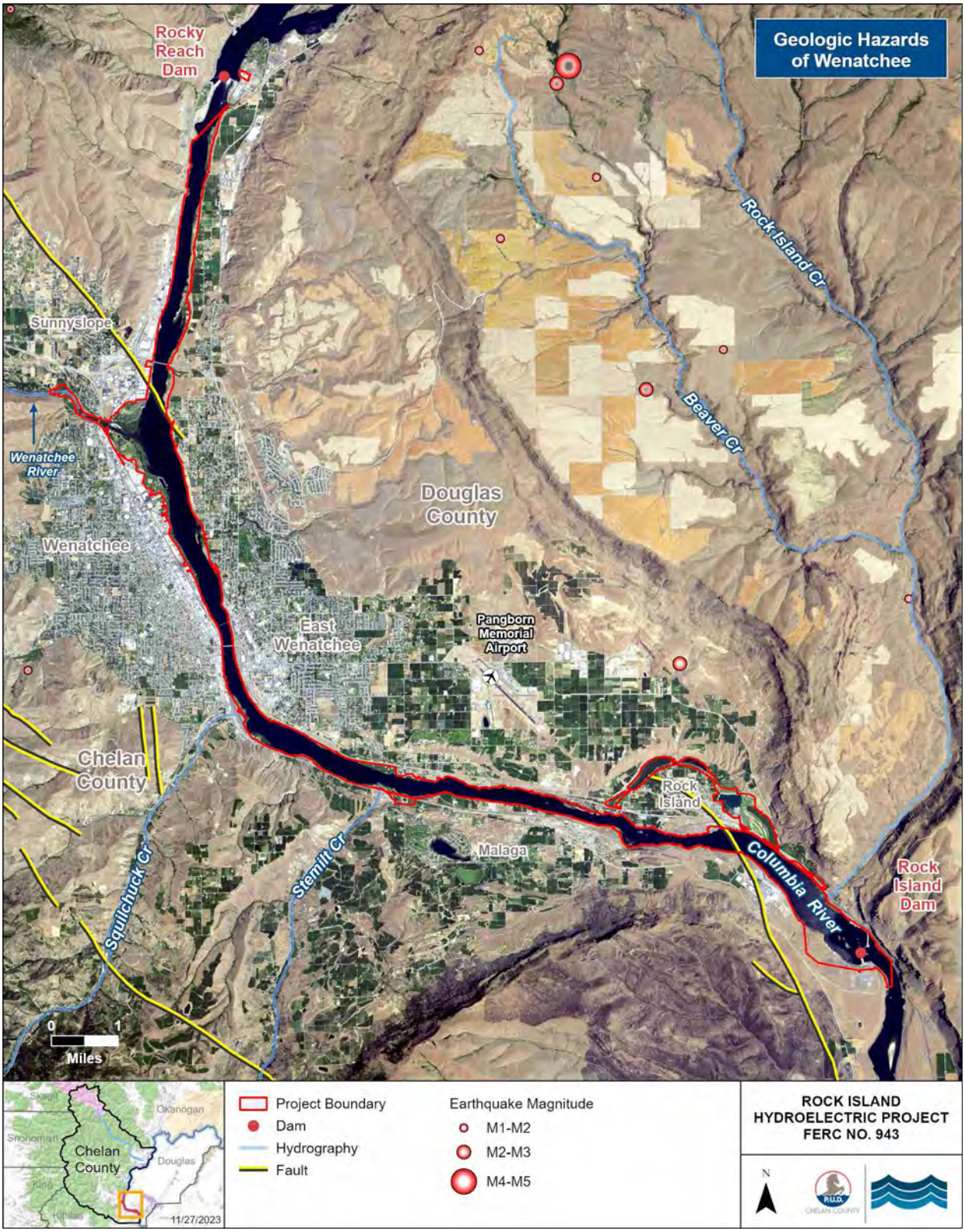

Figure 5.1-2 Geologic Hazards in the Proximity of the Rock Island Project

5.1.2.1 Seismicity and Faulting

The primary structural feature dominating the Wenatchee area is the Chiwaukum graben, bounded by the Leavenworth and Entiat Faults to the west and east, respectively (Gresens et al. 1978; Carson 2021). The southern end of the Entiat Fault underlies the Rock Island Project area along the northeast side, as well as part of the city of Wenatchee.

The Chiwaukum graben is estimated to be 45 to 46 million years old and was structurally active until approximately 40 million years ago. Two hypotheses exist for the origin of the graben involving a strike-slip movement along the Entiat fault. One possibility is that the graben is a result of a wedge opening as terrane west of the Leavenworth fault moved northward while simultaneously rotating clockwise. The other possibility is the presence of a "pull-apart structure" formed by strike-slip motion along a fault that had an existing original offset of the terranes (Gresens et al. 1981).

Movement along the faults of the graben still occurs today. Over 600 earthquakes have been recorded within 20 miles of the Rock Island Project area since earthquake recordings began in 1970. Most earthquakes occurred upstream of the Rock Island Project in the Rocky Reach and Lake Chelan project areas (WADNR 2019). These earthquakes were small and shallow in nature, typically ranging from a magnitude 1 to magnitude 4 intensity with epicenters less than 12.4 miles below the surface. Faults and earthquakes proximal to the Rock Island Project are depicted above, in Figure 5.1-2.

5.1.2.2 Glacial Features

Glacial deposits found in the Wenatchee area are a result of the Cordilleran ice sheet and subsequent Glacial Lake Missoula (WADNR 2021b). The prehistoric glacial lake spanned from modern day Missoula, Montana, and extended over 3,000 square miles. When the ice dams retaining the lake ruptured, the water body quickly moved westward carving out the Columbia River Basalts. Flooding from the release of Glacial Lake Missoula released water comparable to the volume of the Great Lakes at a speed of nearly 65 miles per hour (mph). After the initial breach, the ice dam re-established and breached dozens of times over approximately 2,500 years, forming the coulees of the channeled scablands in the Columbia Plateau. Some of the flooding events progressed down the Columbia River reaching the Wenatchee area; some of the terminal ends are depicted in Figure 5.1-3 (DeGrey and Link 2021). Evidence of flooding is observable in the modern landscape of Wenatchee in the form of flood bars, glacial erratics, and fine-grained slack water sediments (Foster 2008).

During the Pleistocene, the Okanogan ice sheet covered central to northern Washington state and effectively blocked the northern reach of the Columbia River. Because of this ice sheet, Wenatchee experienced less intense flooding and erosional events as compared to other parts of the state. Evidence of prehistoric flooding in the area is typically only seen in flood bars, ice-rafted erratics, and fine-grained sediments from when the ice sheet receded. The retreating ice sheet allowed for large volumes of water to flow through the Columbia River. The flood events that inundated Wenatchee were up to 1,000 ft deep, carrying large boulders from the north. Glacial erratics of gneiss, granite, and other out of place rocks now litter the landscape (Foster 2008).

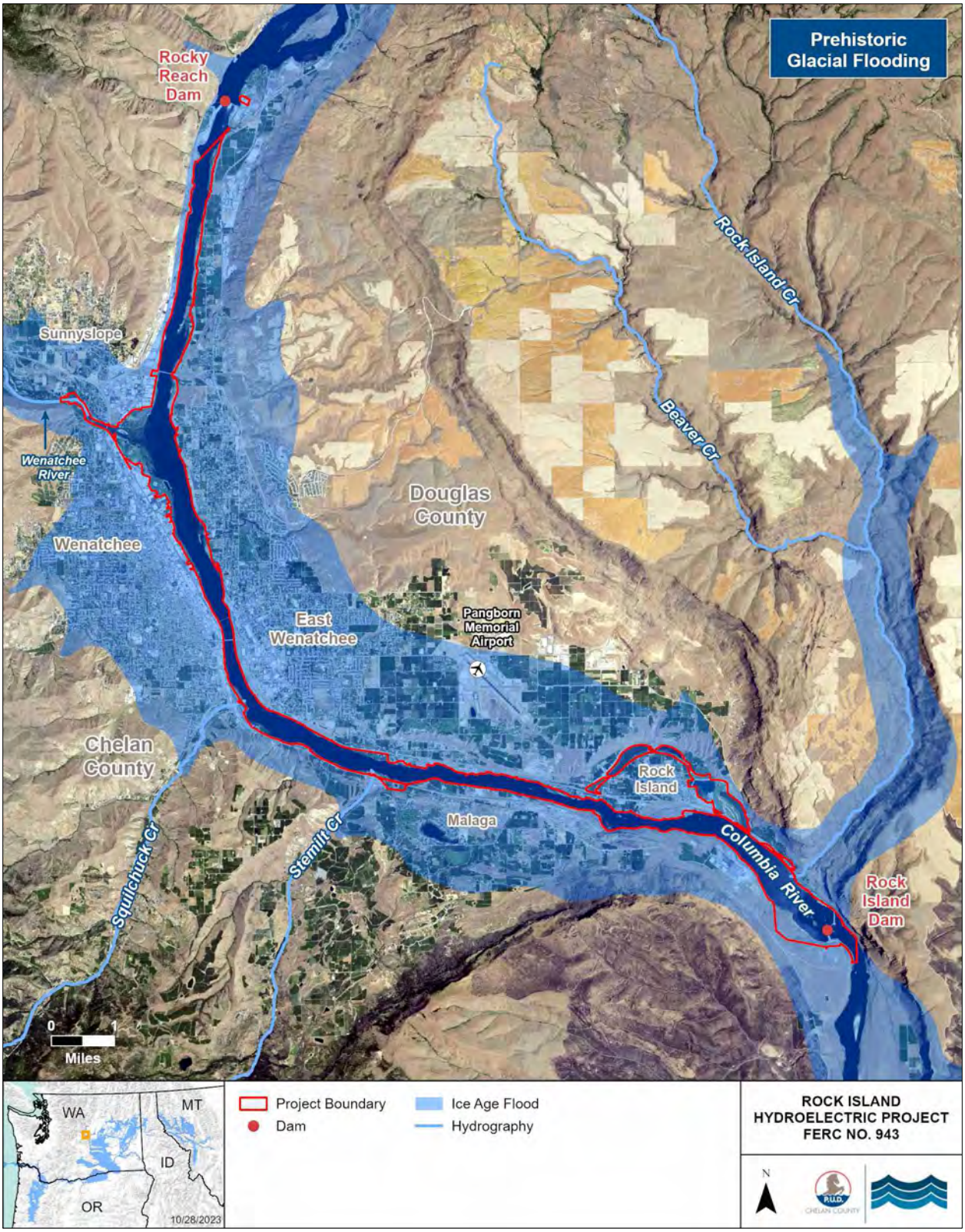

Figure 5.1-3 Extent of Ice Age Flooding in the Area of the Rock Island Project

5.1.2.3 Landslide Features

The Malaga (Stemilt) landslide intersects the Rock Island Project on the western shore of the Rock Island Reservoir in the southern extent of the Rock Island Project area. Most of the Malaga landslide is utilized for agriculture. Movement originating from interbedded sand and silt allowed for a northward slide of the soils approximately 20,000 years ago. Roughly 46 square miles in size and up to 1,300 ft thick, the Malaga landslide is not only the largest landslide in the state of Washington, but potentially one of the largest terrestrial landslides recorded (Sliding Thought 2009).

The historic Malaga landslide still poses an issue for modern day Wenatchee as evidenced in some neighborhoods of Wenatchee. Development in these areas require geologic surveys for slope stability, but continued development, landscape alteration, and the passing of time can allow for continued sliding along the original slide path (Steigmeyer 2016).

5.1.2.4 Mineral Resources

Mineral resources located within one-half mile of the Rock Island Project were identified using the USGS Mineral Resources Data System (2016) (Figure 5.1-1 and Table 5.1-2). The 26 mineral resource features identified are generally associated with Quaternary alluvial deposits. Of the identified mineral resources, only two are reported as active: a prospect for a placer gold deposit and a gravel pit. The remainder of the inactive mine sites were industrial minerals such as sand, gravel, and limestone. The Lovitt gold mine, established in 1894, operated west of the Rock Island Project. The mine is the largest historic mining operation near the Rock Island Project and has been in operation off-and-on since its establishment, most recently in 1967. The primary commodities of the mine were gold and silver, with lead, zinc, arsenic, and antimony as accessories. Exploration still occurs, but the mine is no longer in production (Derkey et al. 1990).

Table 5.1-2 Mineral Resources Within 0.5 Mile of the Rock Island Project

NAME(S)	STATUS	MINERAL RESOURCE
Starnose, Wenatchee Deposit, Staples	Past Producer	Limestone, Sand & Gravel
S and D Paving Company Pit	Past Producer	Sand & Gravel, Construction
Gravel Pit	Past Producer	Sand & Gravel, Construction
Wenatchee Placer	Prospect	Gold
Gravel Pit	Past Producer	Sand & Gravel, Construction
Malaga Pit and Plant	Past Producer	Sand & Gravel, Construction
Unnamed Sand and Gravel	Past Producer	Sand & Gravel, Construction
Batterman	Past Producer	Sand & Gravel, Construction
Olds Pit	Past Producer	Sand & Gravel, Construction
Unnamed Sand and Gravel	Past Producer	Sand & Gravel, Construction

NAME(S)	STATUS	MINERAL RESOURCE
Bolyard Pit	Past Producer	Sand & Gravel, Construction
Shoreline Concrete Company, Rich Sand & Gravel	Past Producer	Sand & Gravel, Construction
Columbia Concrete Pipe Co	Past Producer	Sand & Gravel, Construction
Morrill Asphalt Paving Co, Inc	Past Producer	Sand & Gravel, Construction
Barnhill Pit	Past Producer	Sand & Gravel, Construction
Rock Island Pit	Past Producer	Sand & Gravel, Construction
Alcoa Pit and Plant	Past Producer	Sand & Gravel, Construction
Unnamed Sand and Gravel	Past Producer	Sand & Gravel, Construction
Kawecki Pit	Producer	Sand & Gravel, Construction
Borrow Pit, Douglas County Road Department	Past Producer	Sand & Gravel, Construction
Rocky Reach Pit	Past Producer	Sand & Gravel, Construction
Wilson	Past Producer	Sand & Gravel, Construction
Columbia Concrete Pipe Co	Past Producer	Sand & Gravel, Construction
Palmer Pit	Past Producer	Sand & Gravel, Construction
Rock Island Pit	Past Producer	Sand & Gravel, Construction
Rich Sand and Gravel Pit	Past Producer	Sand & Gravel, Construction

Source: Mason and Arndt 1996

5.1.3 Soils

Soils in this part of the Columbia River valley are generally from two main sources. Where the river channel is close to the toe of a rock slope, soils are mainly colluvial in origin, composed of angular rock fragments, well graded, and ranging from clay sized to boulder sized and in the wider spaces between the shoreline and the valley wall, the predominant soils are fluvial or lacustrine in origin. These soils form extensive terraces and numerous small bars composed of soils ranging from clay to gravel and cobbles. The particles are generally well rounded and different deposits are well sorted (Chelan PUD 1999).

An analysis of the United States Department of Agriculture (USDA) Natural Resources Conservation Service's (NRCS) Web Soil Survey found that approximately 120 different soils fitting into 15 soil series are located within one-half mile of the Rock Island Project (Figure 5.1-4) (NRCS 2022). The remainder of soil classification of the Rock Island Project area includes rock land, water cover, dams, pits, rock outcrop / land, terrace escarpments, alluvial land and riverwash, accounting for 5,000 acres or 23.1 percent of the Rock Island Project area. The most prominent soils of the area include the Pogue, Cashmont, and Quincey series, consisting of 11 percent, 9 percent, and 8 percent, respectively. The other soil series are briefly described with general NRCS characteristics and percentage of cover within one-half mile of the Rock Island Project (Table 5.1-3). The total percentage represented by the identified soils is 76.9 percent of the Rock Island Project area. The

remainder of the area is comprised of dams, pits (areas that have been excavated for sand or gravel), riverwash (unstabilized sandy, silty, clayey, or gravelly sediment that is flooded, washed, and reworked frequently by rivers), rock land, rock outcrop (consists of exposures of bare bedrock other than lava flows and rock-lined pits), terrace escarpments (continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting), and water.

5.1.3.1 Pogue Soil Series

The Pogue soil series is characterized by being a somewhat excessively drained, moderately coarse textured soil that formed in glacial outwash, derived mainly from quartz-bearing rocks. These soils are typically found on terraces along and near the Columbia River in elevations ranging from 700 to 1,000 ft. Slopes for Pogue soil series range from zero to 45 percent. Where not cultivated or altered, the soils are vegetated by big basin sagebrush (*Artemisia tridentata var. tridentata*), needle-and-thread (*Hesperostipa comata*), bluegrass (*Poa bulbosa*) and bitterbrush (*Purshia tridentata*). Pogue soils are commonly used for orchards, hay, range, and pasture. Most commonly, these soils are associated with the Burch, Cashmere, Cashmont, and Peshatin soils; all of which are found in the Rock Island Project area (Beieler 1975).

The representative profile of Pogue soil series is described as a surface layer of grayish-brown, fine, sandy loam that is gravelly or very stony in places, and usually six-inch-thick. The subsoil is brown, 11-inch-thick, fine sandy loam. The substratum is brown, gravelly, 13-inch-thick, fine sandy loam. Outwash sand and gravel underlie these soils at a depth of 30 in., placing this into the NRCS category of a moderately deep soil (Beieler 1975).

5.1.3.2 Cashmont Soil Series

The Cashmont soil series is characterized as a well-drained, moderately coarse, textured soil that formed in alluvial and colluvial material of granite, gneiss, schist, and basalt origin. These soils are on terraces, alluvial fans, and foot slopes. Slopes for Cashmont series range between 0 to 25 percent with elevations ranging from 700 to 1,200 ft. Where these soils are not cultivated, vegetation is mainly big sagebrush, bitterbrush, bluegrass, needle-and-thread, and bluebunch wheatgrass (*Pseudoroegneria spicata*). Like the Pogue series, when cultivated Cashmont soils are used for orchards, vineyards, hay, pasture, and wildlife habitat.

The representative profile of this series is described as having a surface layer that is a dark-gray, gravelly, 21-inch-thick sandy loam. The subsoil is a brown, gravelly, 7-inch-thick sandy loam. The substratum is pale-brown, gravelly, sandy loam that extends to a depth of 60 in., categorizing Cashmont as a very deep soil.

5.1.3.3 Quincy Soil Series

The Quincy soil series is characterized as a somewhat excessively drained, coarse-textured soil formed in fine sand deposited by wind. These soils are on terraces near the Columbia River at elevations ranging from 600 to 1,200 ft with slopes between 0 and 15 percent. Where Quincy soils are not cultivated, vegetation is mainly needle-and-thread, Indian ricegrass (*Achnatherum hymenoides*), bluebunch wheatgrass, big sagebrush, and bitterbrush. Where soils have been cultivated, it is commonly for orchards, hay, and pasture (Beieler 1975).

The representative profile of Quincy series soils is described as having a surface layer that is a grayish-brown, loamy, 10-inch-thick fine sand. The substratum is light brownish-gray fine sand that extends to a depth of 60 in., giving this an NRCS classification of a very deep soil.

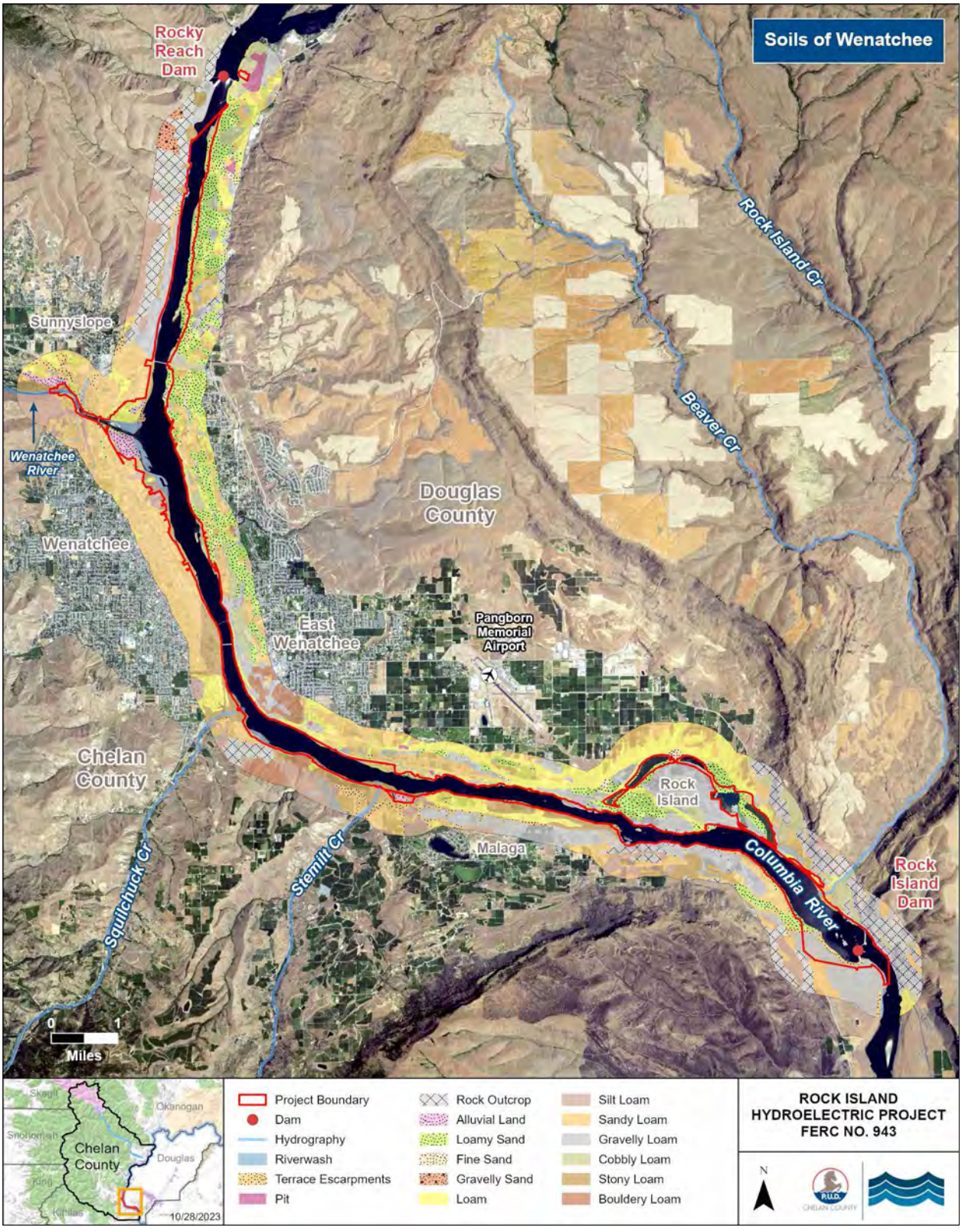

Figure 5.1-4 Soil Types Within 0.5 Mile of the Rock Island Project

Table 5.1-3 Soils Within 0.5 Mile of the Rock Island Project

SOIL SERIES/ ASSOCIATION	GENERAL CHARACTERISTICS
Aeneas Fine Sandy Loam	Very deep, well drained soils that formed from loess and volcanic ash. These soils are located on drainageways of non-glaciated plateaus and have slopes ranging from 0 to 10%.
Alstown Series	Moderately deep to very deep, well drained soils that formed from loess over older loess. These soils are located on scarp slopes of non-glaciated plateaus and have slopes ranging from 8 to 15%, and 30 to 65%.
Argabak Series	Shallow, well drained soils that formed from colluvium and residuum from basalt. These soils are located on non-glaciated plateaus and have slopes ranging from 0 to 35%.
Bakeoven-Lickskillet-Zen Series	Very shallow, well drained soils that formed from colluvium and residuum from basalt. These soils are located on intermounds of non-glaciated plateaus and have slopes ranging from 5 to 25%.
Benwy-Selah-Alstown Series	Deep, well drained soils that formed from loess over older loess mixed with colluvium over a duripan over basalt. These soils are located on non-glaciated plateaus and have slopes ranging from 0 to 8%.
Beverly Series	Shallow to moderately deep, somewhat excessively drained soils that formed from recent sandy and gravelly alluvium. These soils are located on fans and low river terraces and have slopes ranging from 0 to 8%.
Bjork Series	Shallow to moderately deep, well drained soils that formed from material weathered from schist, gneiss, or sandstone. These soils are located on foot slopes, terraces, and broad ridgetops on uplands, and side of slopes of uplands and have slopes ranging from 8 to 65%.
Burbank Series	Shallow to moderately deep, excessively drained soils that formed from eolian sand over mixed alluvium and glacial outwash. These soils are located on terraces and have slopes ranging from 0 to 25%.
Burch Series	Very deep, well drained soils that formed from mixed alluvium. These soils are located on terraces and have slopes ranging from 0 to 45%.
Cashmere Series	Deep to very deep, well drained soils that formed from terraces to high terraces. These soils are located on glaciofluvial deposits over a duripan and have slopes ranging from 0 to 25%.
Cashmont Series	Very deep, well drained soils that formed from gravelly alluvium. These soils are located on fans on terraces and have slopes ranging from 5 to 25%.
Cheviot-Ralls Series	Very deep, well drained soils that formed from loess mixed with colluvium derived from basalt. These soils are located on non-glaciated plateaus and have slopes ranging from 0 to 65%.
Colockum Series	Very deep, well drained soils that formed from glacial till of basaltic or sandstone origin mixed with some loess and volcanic ash. These soils are located on uplands and have slopes ranging from 3 to 45%.
Cowiche Series	Deep, well drained soils that formed from material weathered from sandstone, gneiss, or schist and loess. These soils are located on sides and tops of ridges on uplands and have slopes ranging from 3 to 65%.

SOIL SERIES/ ASSOCIATION	GENERAL CHARACTERISTICS
Ellisforde Series	Very deep, well drained soils that formed from reworked lacustrine sediment that has wind laid silt and fine sandy loam on the surface. These soils are located on lake terraces and have slopes ranging from 3 to 15%.
Entiat-Rock Series	Shallow, well drained soils that formed from decomposing granodiorite, granite, or gneiss bedrock. These soils are located on uplands and have slopes ranging from 0 to 70%.
Esquatzel Silt Loam	Very deep, well drained soils that formed from silty alluvium. These soils are located on Moses Coulee and have slopes ranging from 0 to 3%.
Grinrod Series	Moderately deep, well drained soils that formed from colluvium and residuum derived from basalt. These soils are located on scarp slopes of non-glaciated plateaus and have slopes ranging from 30 to 70%.
Kiona-Rock outcrop Series	Very deep, well drained soils that formed from loess mixed with colluvium derived from basalt. These soils are located on scarp slopes of non-glaciated plateaus and have slopes ranging from 25 to 65%.
Logy Series	Very deep, somewhat excessively drained soils that formed from alluvium and colluvium. These soils are located on fans and have slopes ranging from 3 to 15%.
Magallon Series	Shallow to moderately deep, somewhat excessively drained soils that formed from loess mixed with sandy glacial outwash. These soils are located on terraces and have slopes ranging from 3 to 15%.
Malaga Series	Shallow to moderately deep, somewhat excessively drained soils that formed from loess mixed with gravelly glacial outwash. These soils are located on terraces and have slopes ranging from 0 to 15%.
Peshatin Series	Shallow to moderately deep, well drained soils that formed from Loess mixed with glacial outwash and ablation till. These soils are located on terraces and scarp slope and have slopes ranging from 0 to 45%.
Pogue Series	Moderately deep, somewhat excessively drained soils that formed from glacial outwash derived mainly from quartz to bearing rock. These soils are located on terraces and have slopes ranging from 0 to 45%.
Quincy Series	Very deep, somewhat excessively drained soils that formed from fine sand deposited by wind. These soils are located on terraces and have slopes ranging from 0 to 30%.
Renslow silt loam	Very deep, well drained soils that formed from loess over older loess. These soils are located on non-glaciated plateaus and have slopes ranging from 0 to 15%.
Ritzville silt loam	Deep, well drained soils that formed from wind to laid silt over basalt bedrock. These soils are located on ridgetops on uplands and have slopes ranging from 0 to 45%.
Rubble land-Rock outcrop Complex	Moderately deep, excessively drained soils that formed from basalt. These soils are located on colluvial deposits of gravel, cobbles, stones, and boulders and have slopes ranging from 30 to 65%.
Supplee very fine sandy loam	Very deep, well drained soils that formed from pumice, volcanic ash, and deposits of loess. These soils are located on terraces and have slopes ranging from 3 to 25%.

SOIL SERIES/ ASSOCIATION	GENERAL CHARACTERISTICS
Torriorthents	Deep, excessively drained soils that formed from glacial outwash. These soils are located on Columbia River terraces and have slopes ranging from 25 to 65%.
Tyee Gravelly Loamy Coarse Sand	Shallow, well drained soils that formed from decomposing granodiorite with various amounts of loess and volcanic ash. These soils are located on uplands and have slopes ranging from 25 to 65%.
Vitrandic Argixerolls-Argabak Series	Moderately deep to very deep, well drained soils that formed from loess mixed with volcanic ash over colluvium and residuum derived from basalt. These soils are located on north aspects and depressions of non-glaciated plateaus and have slopes ranging from 20 to 80%.
Wenatchee Silt Loam	Moderately deep, well drained soils that formed from old alluvium or in valley fill, mainly from sandstone, granite, gneiss, and schist. These soils are located on terraces and have slopes ranging from 0 to 8%.
Xerofluvents-Beverly Association	Very deep, excessively drained soils that formed from alluvium. These soils are located on flood plains and have slopes ranging from 0 to 5%.
Zen-Rock Outcrop Series	Moderately deep, well drained soils that formed from wind to laid silt mixed with small amounts of volcanic ash over basalt bedrock. These soils are located on uplands and have slopes ranging from 25 to 45%.

Source: NRCS 2022

5.1.4 Shoreline and Streambank Conditions

Much of the central shoreline in the Rock Island Project area is bordered by commercial and residential properties running through the cities of Wenatchee on the western shore, and East Wenatchee on the eastern shore of the Columbia River. In this area, there are public access areas including parks and boat launches (see Section 5.6). Vegetation borders the shoreline in most places. In the southern portion of the Rock Island Project area, the shoreline features small agricultural fields, typically surrounded by additional vegetation adjacent to the reservoir. The residential communities located in this southern portion also have vegetation along the shoreline. The urban sprawl of Wenatchee and East Wenatchee dominate the central shorelines of the Rock Island Project area. However, much of the shoreline has been preserved as greenspace and public parks. To the west, the northern shorelines of the Rock Island Project area remain undeveloped, while to the east, they are characterized by agricultural fields and greenspace. For a more in-depth account of land use along the Rock Island Project shorelines, refer to Section 5.7.

5.1.5 Erosion

Shoreline erosion is caused by wind waves, water level fluctuations, boat wakes, saturated soils, steep slopes, and human use (NMFS 2022) which have the potential to impact sensitive species. In response to shoreline erosion, Chelan PUD contracted Anchor QEA to evaluate erosion risks at various locations around the Rock Island Reservoir as part of the Shoreline Stabilization

Programmatic Biological Assessment (Anchor 2022). NMFS and USFWS issued Biological Opinions (BiOps) on February 2, 2022, and December 9, 2022, respectively (NMFS 2022; USFWS 2022). These BiOps contain Reasonable and Prudent Measures (RPMs) and Terms and Conditions that Chelan PUD must implement when constructing bank stabilization projects to minimize take of endangered species. These measures include activities such as vegetation removal, regrading of stream banks, placement of fill, planting native species, and the installation of woody material, cobbles, and boulders (NMFS 2022).

Chelan PUD conducts regular inspections and monitoring of the shoreline within PUD parks and cultural resource protection sites in the Rock Island Project Boundary. Annual surveys and assessments, especially after significant flow events, inform the baseline inventory and the 5-year erosion control plan. Sites of concern undergo a 3-year process that includes observations, mitigation assessments, erosion control approach development, hiring design consultants, obtaining permits, and implementing measures. Upon completion, each site has specific monitoring and reporting requirements.

Chelan PUD also provides public access to four erosion control demonstration sites, including Walla Walla Point Park, to educate and inform the public about erosion management techniques and efforts to maintain shorelines in the area (Anchor 2022).

In addition, Chelan PUD developed a Shoreline Management Manual (SMM),[17] consistent with current FERC license requirements, aimed at protecting and enhancing the scenic, recreational, and environmental values of the Rock Island Project (Chelan PUD 2023). This manual incorporates physical and biological responses, such as best management practices (BMPs), applied on a case-by-case basis to limit shoreline erosion.

5.1.6 Sedimentation

Sediment deposition at the Rock Island Project is primarily affected by the upstream drainage basin of the Columbia River. While the drainage area of the Columbia River upstream of the Rock Island Project is substantial, sediment transport into the Rock Island Reservoir is minimized due to the presence of upstream dams (BioAnalysts 2000).

The Wenatchee River contributes sediments to the Rock Island Project area during seasonal freshet conditions. The substrate of the lower Wenatchee riverbed is largely composed of cobble, gravel, and boulders, and does not contribute to significant additional sediments (Tetra Tech 2017). The mouth of Wenatchee River is a low gradient, low velocity sand-dominated pool due to

[17] The SMM is not a FERC-required or approved document.

the backwatering effect of the Columbia River and transitions rapidly to a cobble-dominated system in the upstream direction (Tetra Tech 2017). Historically, this section of the river is thought to have been influenced by frequent flooding that would have deposited large woody debris and sediments and may have been subject to modifications through beaver activity (Tetra Tech 2017). The historical floodplain extends into Confluence State Park but is now disconnected due to floodplain modifications (Tetra Tech 2017).

5.1.7 References

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5.2 Water Resources

As specified in 18 CFR § 5.6(d)(3)(iii), this section summarizes readily available information on drainage area, hydrology, flow duration curves, water uses, instream flow uses, water rights, reservoir morphometry, channel gradients, applicable water quality standards, and water quality of waters affected by the Rock Island Project.

5.2.1 Drainage Area

Rock Island Dam spans the Columbia River near RM 453.4 (Figure 5.2-1). The reservoir formed by Rock Island Dam drains approximately 89,400 square miles of the Columbia River Basin including portions of eastern Washington, Northern Idaho, western Montana, and southeastern British Columbia (Figure 3.1-1) (USGS 2023a). The Rock Island Reservoir extends approximately 20.7 RMs upstream to Rocky Reach Dam (RM 473.7). The Rock Island Project discharges into the Wanapum Reservoir, formed by Wanapum Dam, approximately 37.6 miles downstream at RM 415.8. At Rock Island Dam, the topographic relief ranges from 984 to 2,625 ft in elevation (NGVD 29) east to west (USGS 2016).

The Wenatchee River is the primary tributary to the Rock Island Reservoir, with a drainage area of approximately 1,350 square miles, and which enters the Columbia River at RM 468.4 (Figure 5.2-1). Smaller tributaries to the Rock Island Reservoir include Squilchuck Creek, with a drainage area of 27.5 square miles; Stemilt Creek, with a drainage area of 33.5 square miles; and Rock Island Creek, with a drainage area of 100 square miles (RH2 Engineering Inc. 2007; Foster Creek Conservation District 2003).

The Wenatchee River is a predominantly snowmelt driven system with most water inputs coming from over 40 high-elevation tributaries and streams within the eastern range of the Cascade Mountains. The Wenatchee River originates in Lake Wenatchee, near Leavenworth, Washington, which is fed by the Little Wenatchee and White rivers. Major tributaries of the Wenatchee River include Nason Creek, the Chiwawa River, Icicle Creek, Chiwaukum Creek, Chumstick Creek, Peshastin Creek, and Mission Creek. The upper and lower basins are defined by Tumwater Canyon, a steep-gradient constriction just upstream of the confluence of the Wenatchee River and Icicle Creek. The Wenatchee Basin downstream of Tumwater Canyon is semi-arid, has a much larger floodplain, and has few water inputs (Ecology 1995).

Under the current license, the Rock Island Project Boundary also encompasses six ponds near the city of Rock Island adjacent to the Columbia River, located north of the railway and Highway 28 (Figure 5.2-2): Blue Heron Pond, Big Bow Pond, Hideaway Pond, Pit Pond, Putters Pond and Hammond Pond (Figure 5.2-2). The USFWS National Wetlands Inventory (NWI) classifies Blue

Heron Pond (9.6 acres) and Pit Pond (3.7 acres) as freshwater ponds and classifies Big Bow Pond (52 acres), Hideaway Pond (18.5 acres), Putters Pond (54.2 acres) and Hammond Pond (40.1 acres) as lakes (USFWS 2023). All the ponds are also referred to as lakes by Washington Department of Ecology (Ecology) and WDFW. For more information on lacustrine ecology, see Section 5.5.

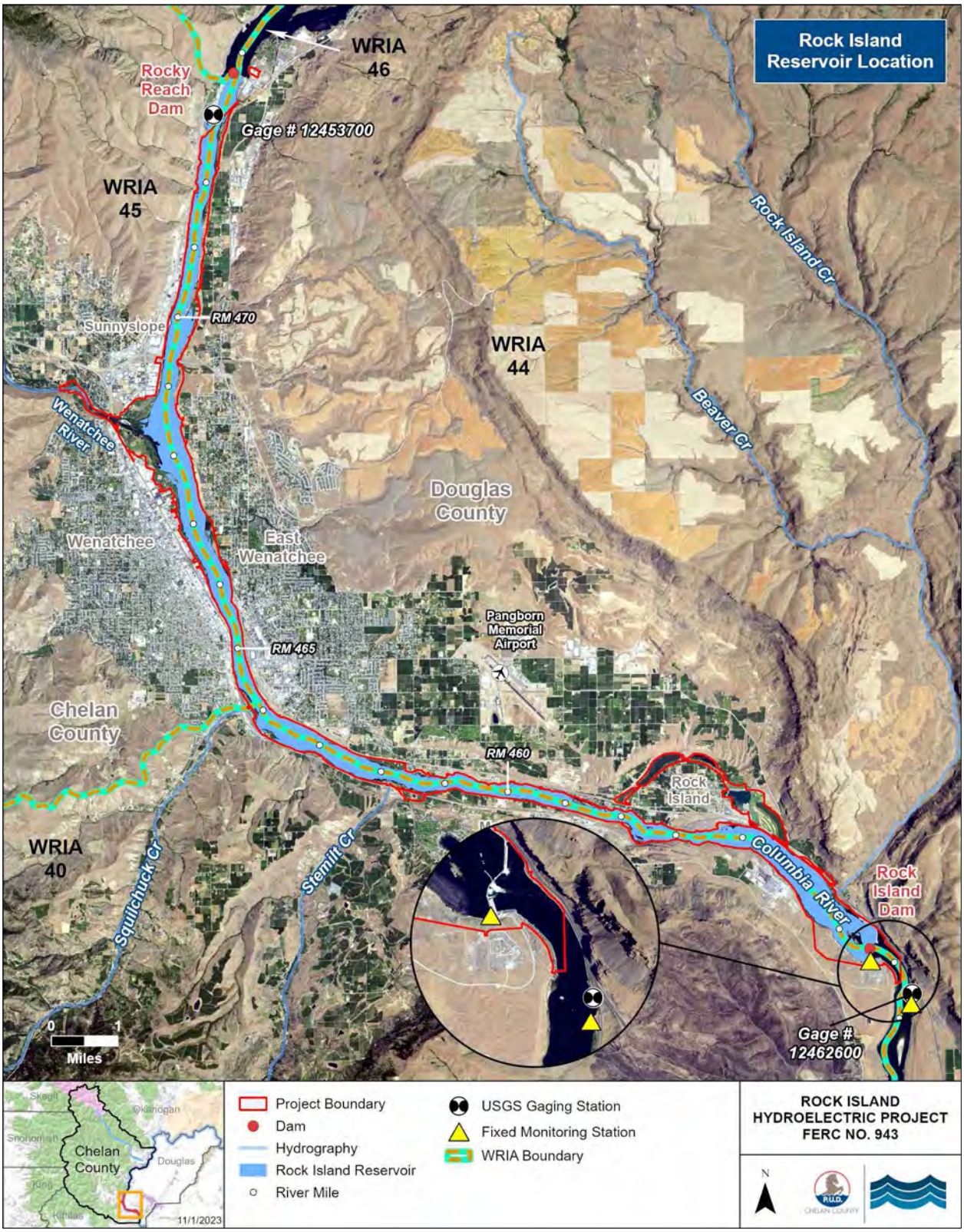


Figure 5.2-1 Rock Island Reservoir Location

Figure 5.2-2 Rock Island Ponds, Rock Island Project

5.2.2 Rock Island Reservoir

5.2.2.1 Reservoir Capacity

In 2021, a comprehensive bathymetric survey was conducted using a combination of topobathymetric light detection and ranging (LiDAR) data covering the shallow areas around the edges of the reservoir, and multi-beam bathymetric survey covering the remainder of the reservoir. The LiDAR and bathymetry data were combined into a comprehensive high-resolution digital elevation model (see Appendix E.1) (NHC 2023). The digital elevation model was successfully field verified in 2023 (Four Peaks 2023a). Survey data were used to develop a two-dimensional (2-D) hydraulic model based on the USACE Hydrologic Engineering Center River Analysis System (HEC-RAS) modeling framework. Rock Island pool metrics were updated, and new system stage-storage-discharge curves developed (see Appendix E.1) (NHC 2023).

The water-surface elevation, and hence the surface area and other reservoir metrics, are influenced by the incoming flows and Rock Island Dam forebay elevation, as shown in Figure 5.2-3 through Figure 5.2-6 (based on NHC 2023; see Appendix E.1).

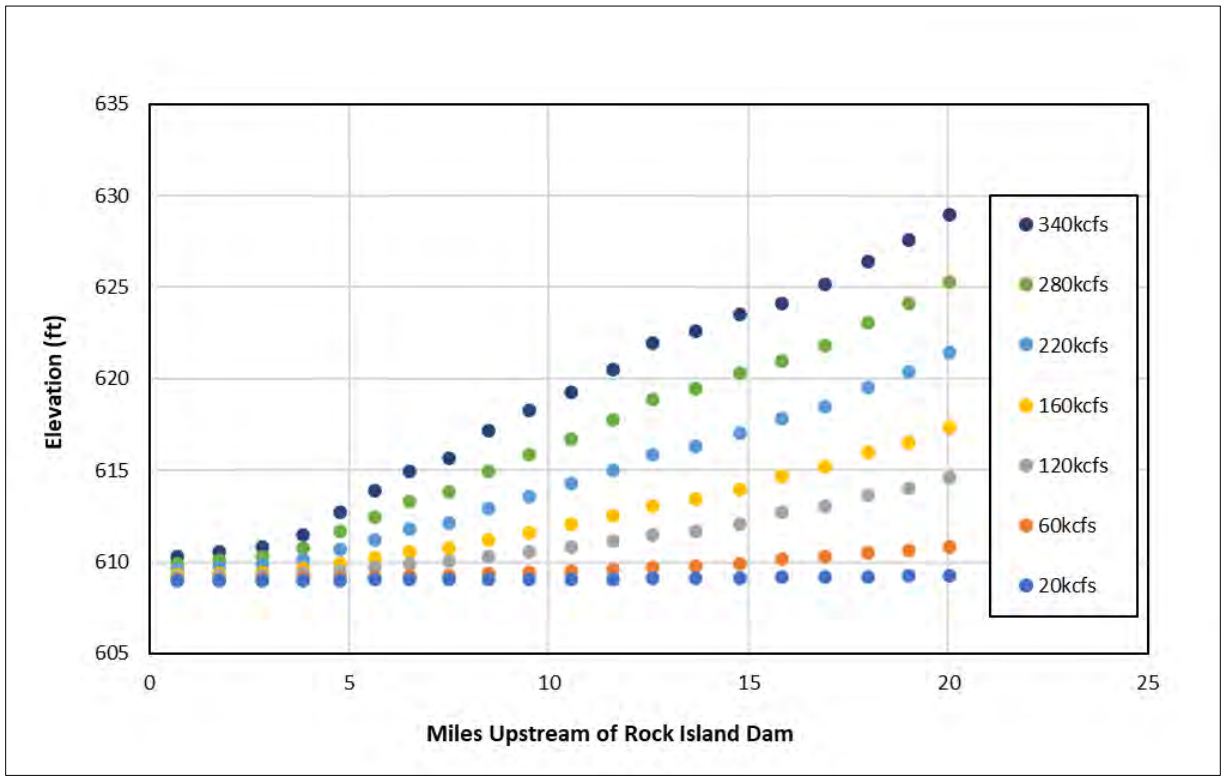


Figure 5.2-3 Shoreline Elevations by River Mile – 609' Forebay, Variable Inflow

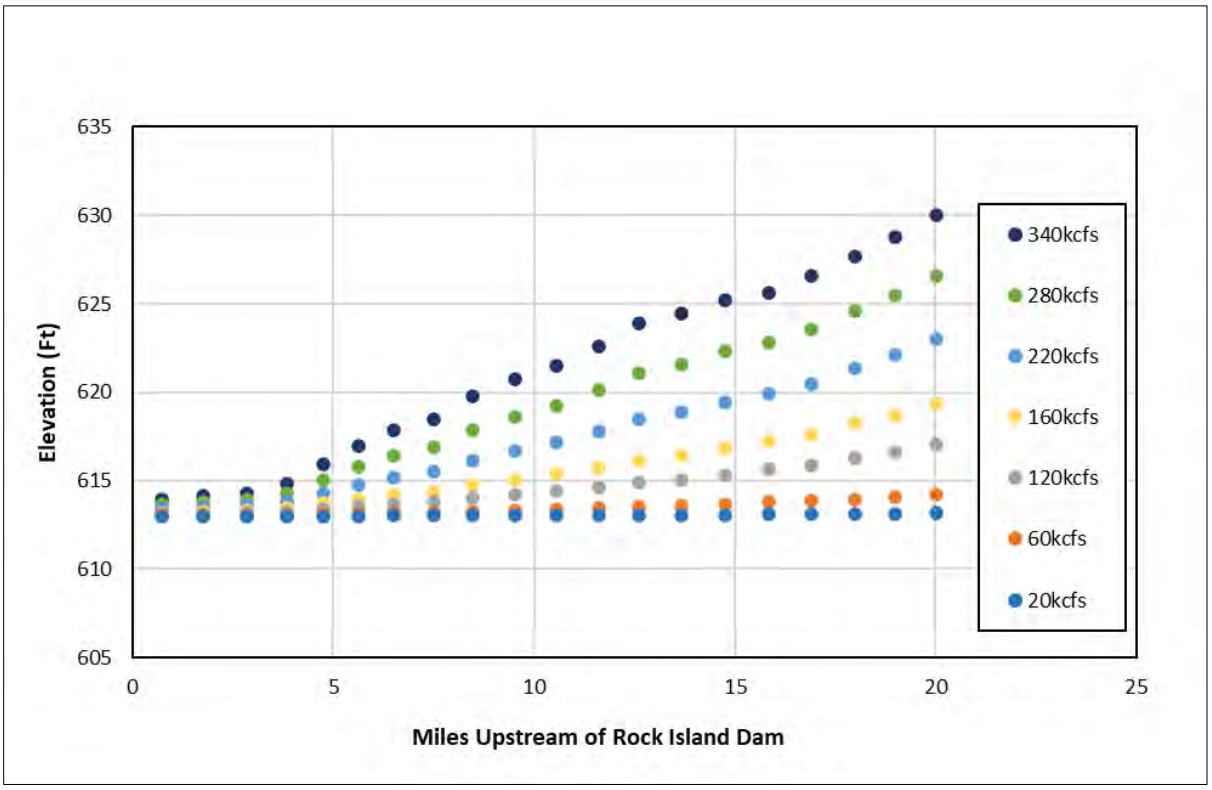


Figure 5.2-4 Shoreline Elevations by River Mile – 613' Forebay, Variable Inflow

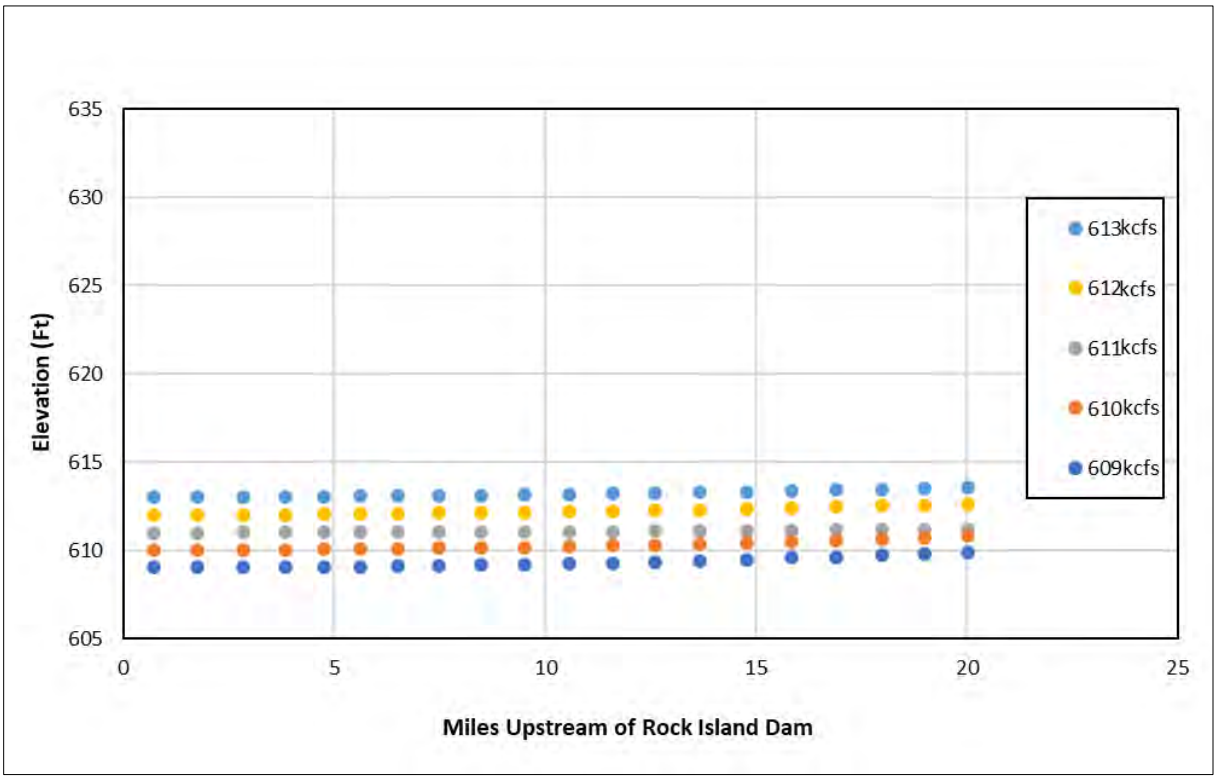


Figure 5.2-5 Shoreline Elevations by River Mile – 40 kcfs of Flow, Variable Forebay

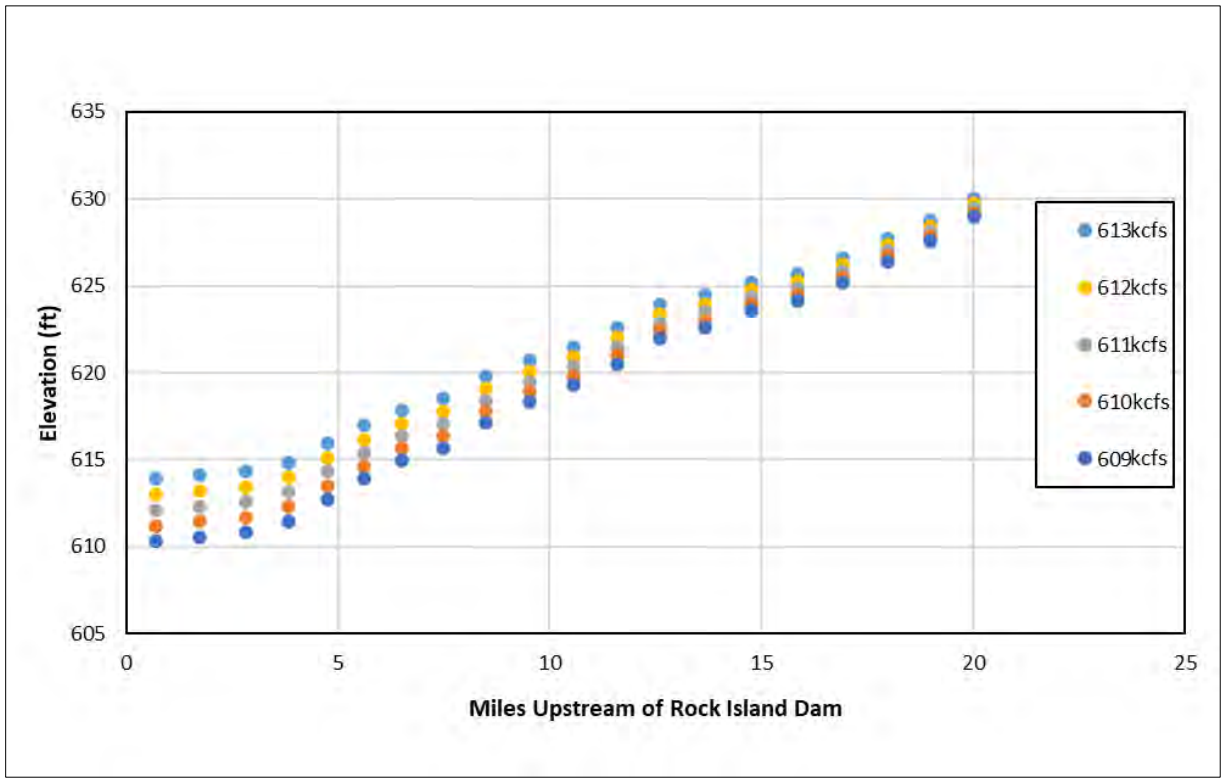


Figure 5.2-6 Shoreline Elevations by River Mile – 340 kcfs of Flow, Variable Forebay

At a typical inflow of 100 kilo cfs (kcfs), Rock Island Dam provides approximately 12,189 ac-ft of usable storage between the minimum operating pool (609 ft above sea level NGVD 29) and the normal maximum reservoir elevation (613 ft NGVD 29) (see Appendix E.1) (NHC 2023). Detailed descriptions of flow routing structures, including dam spillways and turbine intakes, are provided in Section 4.3. The 20.7-mile-long impoundment has a surface area of approximately 3,522 acres with a gross storage volume of 126,312 ac-ft[18] (see Appendix E.1) (NHC 2023). The average width of the impoundment is 1,389 ft[19] with a shoreline perimeter of approximately 52.6 miles.[20] Maximum water depths in the forebay reach approximately 213.7 ft (see Appendix E.1) (NHC 2023), with an average depth of approximately 44 ft in the forebay of Rock Island Dam at a forebay elevation of 612 ft NVGD 29, and an average depth of 15 ft in the tailrace of Rocky Reach Dam[21] (CBR 2000).

[18] Calculated at an inflow of 100 kcfs and Rock Island Project forebay elevation of 612 ft NGVD 29.
[19] Calculated at an inflow of 100 kcfs and Rock Island Project forebay elevation of 612 ft NGVD 29.
[20] Calculated at an inflow of 100 kcfs and Rock Island Project forebay elevation of 612 ft NGVD 29.
[21] Calculated at an inflow of 100 kcfs and Rock Island Project forebay elevation of 612 ft NGVD 29.

5.2.2.2 Channel Gradient

Most of the of the Columbia River in the United States, apart from the 51-mile-long Hanford Reach, is completely impounded by dams such that the reservoir of each dam extends upstream to the base of the next dam. Although channel gradient in free-flowing stream reaches is an important characteristic driving habitat formation processes, including erosion and sediment transport (Buffington and Montgomery 2013), channel gradient in impounded reaches is more difficult to estimate, and does not drive processes influencing aquatic habitat.

The Columbia River Salmon Passage Model provides geometric data for the reservoirs in the Mid-Columbia (CBR 2000). The downstream reach between Wanapum Dam and Rock Island Dam is fully inundated with the average depths of the Wanapum Reservoir ranging from 116 ft at Wanapum Dam to 42 ft at Rock Island Dam (approximately 38 RMs) (CBR 2000). Average channel gradient downstream of Rock Island Dam is approximately 0.04 percent.

5.2.2.3 Substrate

Glacial and great Missoula flood deposits underlie the reservoir and form the reservoir and former Columbia channel banks. Sand and gravel occur in the upstream portions of the reservoir with sand and silt being deposited in the downstream portions. Additional sediment is deposited in the reservoir in the form of a delta where the Wenatchee River enters the reservoir (Chelan PUD 2019a). Suspended sediment transport in the Mid-Columbia River is relatively low. Each upstream reservoir allows a portion of the seasonally high suspended sediment loads from the Upper Columbia River to settle out during transit. Direct input of fines from the tributaries is now the main source of silt and fine sand into Rock Island Reservoir. The fine sediment deposits on the bed where it is reworked by slumping off the steep reservoir edges and by higher velocities that occur during extreme flood flows (Chelan PUD 2019a). This tends to move the deposited clay, silt, and fine sand into the deeper portions of the reservoir (NMFS 2002).

5.2.3 Hydrology

The hydrology of the Columbia River and the contributions from the Wenatchee River tributary are summarized below.

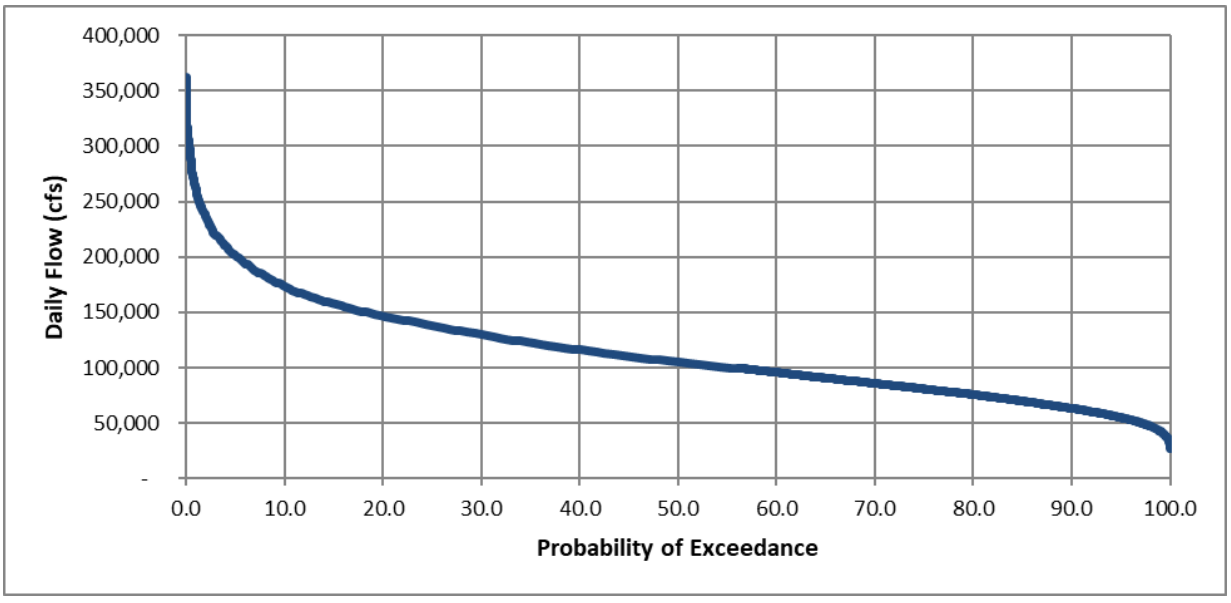
5.2.3.1 Columbia River

The annual average runoff of the Columbia River at its mouth is approximately 198 million ac-ft with average year-round flows of approximately 275,000 cfs. The total available water storage in the Columbia River Basin is approximately 55 million ac-ft (BPA, USBR, USACE 2001). Numerous dams and impoundments developed for hydropower, irrigation, and flood control alter flows in

the basin. Storage dams in United States and Canada capture high flows from snowmelt and runoff to support the various uses described in Section 3.6. In the early 1900s, approximately 75 percent of the Columbia River's flow occurred between April and September. By 1980, the proportion of annual flow occurring in the summer months had been lowered to approximately 50 percent (NRC 2004).

Flows through the Rock Island Project area are measured by two USGS gages; the first is at the upstream end of the Rock Island Reservoir approximately 1.5 miles downstream of Rocky Reach Dam (USGS 12453700 Columbia River at Rocky Reach Dam, WA) and the second is 1 mile downstream of Rock Island Dam (12462600 Columbia River Below Rock Island Dam, WA) (Figure 5.2-1 and Figure 5.2-7). Total flows through Rock Island Dam are presented based on the downstream gage (USGS 12462600) using the period 1988 through 2022 (USGS 2023a). Hydrology is described for water years using flow data from October 1 through September 30.

Flow duration curves summarize the relationship between the magnitude and duration of daily streamflow and describe the percentage of time that flow in a river has equaled or exceeded a given level (Vogel and Fennessey 1994). The shape of the curve in the high-flow region indicates the type of flood regime the basin is likely to experience; at Rock Island Dam, the relatively flat curve in the high-flow region (high flows for short periods) is consistent with snowmelt floods and regulation of floods with reservoir storage (Figure 5.2-7).



Source: USGS 2023a

Figure 5.2-7 Annual Flow Duration Curve for Columbia River Below Rock Island Dam, USGS Gage 12462600 (1988-2022)

The shape of the low-flow region reflects the ability of the basin to sustain low flows during dry seasons; at Rock Island Dam the flat curve indicates that moderate flows are sustained throughout the year. The annual median flow (i.e., the flow greater than those occurring 50 percent of the time throughout the year) from water years 1988 to 2020 was 105,500 cfs (Figure 5.2-7) with annual average flows ranging between 78,560 cfs (2001) and 159,000 cfs (1997).

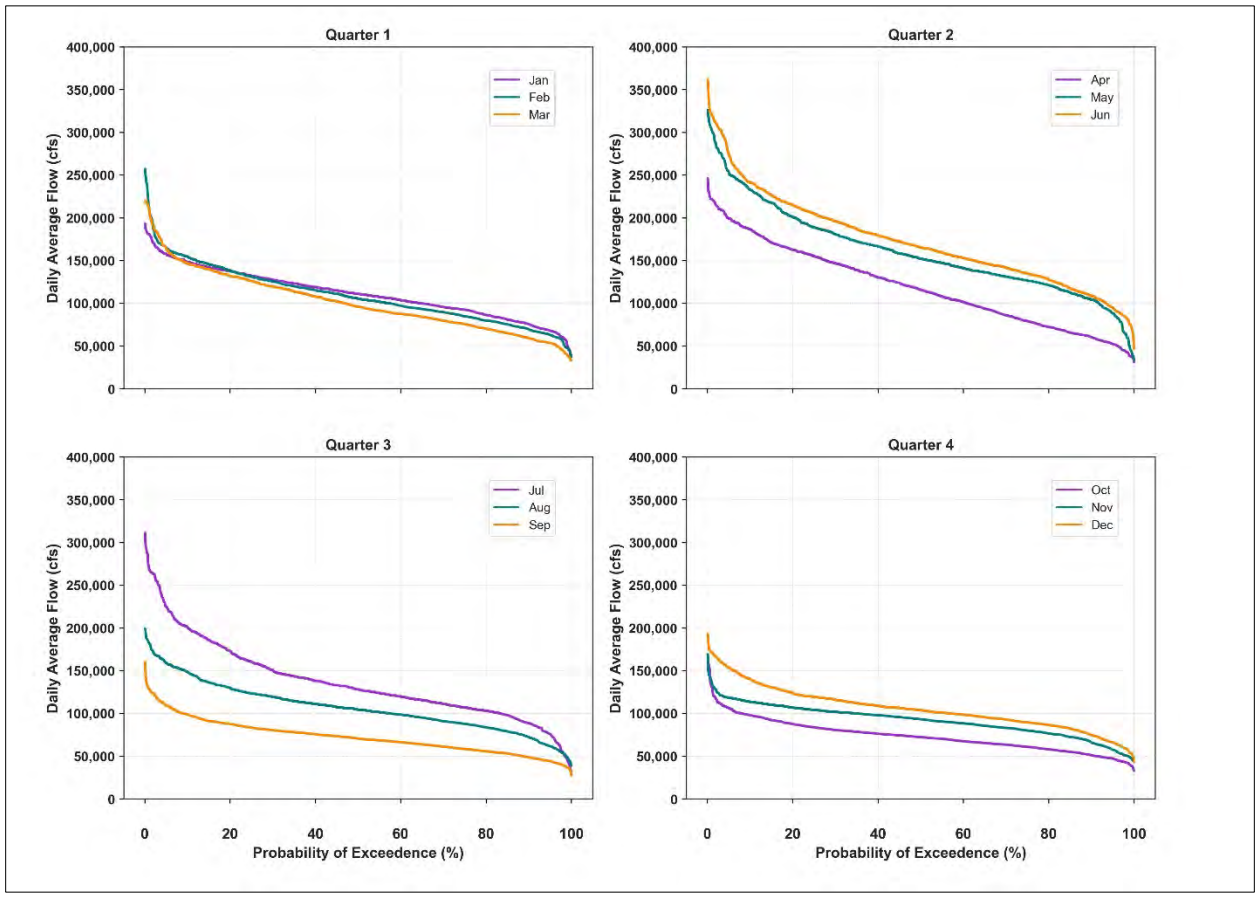
The highest mean daily flow measured over the period of record (1961 to 2020) was 547,000 cfs on June 9, 1961 (USGS 2023a). The highest mean daily flow during the period of analysis (1988 to 2022) was 362,000 cfs on June 12, 1997; flows over 200,000 cfs are observed on approximately 5 percent of days. The state of Washington defines natural flood conditions as the highest flood that occurs for seven consecutive days in a 10-year period (Pickett et al. 2004). The 7-day, 10-year frequency (7Q10) flood flow for the Rock Island Project has been calculated as 264,000 cfs (Pickett et al. 2004). The lowest daily flow during the period of analysis was 27,600 cfs on September 17, 2019 (USGS 2023a).

The Columbia River hydrograph at Rock Island Dam reflects dry summer and fall periods, with winter precipitation predominantly occurring as snow in the upper basin. Peak snowmelt runoff generally occurs in June and lasts for 30 to 60 days before flows taper off to low streamflow by September (USGS 2023a). Monthly flow duration curves are provided in Appendix F. The monthly mean, minimum, and maximum daily mean flows for the Columbia River downstream of the Rock Island Dam are presented in Table 5.2-1 and monthly flow exceedance probabilities are presented in Figure 5.2-8. Mean flows are highest in May and June (approximately 160,000 to 170,000 cfs) and decline to under 80,000 cfs in September and October.

Table 5.2-1 Monthly Flow Statistics for Columbia River Below Rock Island Dam, USGS Gage 12462600 (1988 to 2022)

MONTH	MINIMUM MEAN DAILY FLOW (CFS)	AVERAGE MEAN DAILY FLOW (CFS)	MAXIMUM MEAN DAILY FLOW (CFS)
January	37,900	114,755	193,000
February	37,000	111,427	257,000
March	31,300	103,649	220,000
April	30,200	118,926	255,000
May	33,800	158,944	326,000
June	46,900	171,632	362,000
July	29,700	134,488	298,000
August	38,900	105,866	198,000
September	27,600	72,346	136,000
October	33,200	74,631	163,000
November	43,100	93,091	176,000
December	43,000	108,175	193,000
Annual	27,600	114,013	362,000

Source: USGS 2023a



Source: USGS 2023a

Figure 5.2-8 Monthly Flow Exceedance Probabilities for the Columbia River Below Rock Island Dam, USGS Gage 12462600 (1992 to 2021)

5.2.3.2 Wenatchee River Tributary

Flows in the Wenatchee River Basin are currently monitored by three USGS gages. The gage nearest the confluence with the Columbia River is at RM 7 (USGS 12462500 Wenatchee River at Monitor, WA) and monitors flows from approximately 96 percent of the drainage area (USGS 2023b). Over the period of record from October 1962 to present, flows ranged between 208 cfs on November 26, 1993, and 47,500 cfs on November 30, 1995. Mean annual flows ranged between 1,589 cfs in 2001 and 5,261 cfs in 1972 and averaged 3,235 cfs for the period 1963 to 2022 (USGS 2023b).

5.2.4 Existing and Proposed Uses of Project Water

The Columbia River in the Rock Island Project area has been designated for the aquatic life uses of salmonid spawning, rearing and migration; primary contact recreational uses; water supply for domestic, agricultural, industrial and stock watering uses; and the miscellaneous uses of wildlife

habitat, fish harvesting, commerce and navigation, boating, and aesthetic values (Washington Administrative Code [WAC] 173-201A-602) (Table 5.2-2).

For purposes of statewide water resources management, Ecology and other state natural resources agencies have divided the state into 62 Water Resource Inventory Areas (WRIAs) (Ecology 2021a). The WRIAs provide for locally based watershed planning rather than statewide planning. State funding was made available for each WRIA to develop a Watershed Plan to manage water resources, protect water rights, protect instream and out-of-stream flows, and support economic development. Typical components of the watershed plans include assessments of water quality, water quantity, instream flows, habitat, and water storage. The Rock Island Project Boundary includes portions of the Wenatchee (WRIA 45) and Alkali - Squilchuck (WRIAs 40a and 40b) watersheds west of the Columbia River and the Moses Coulee watershed (WRIA 44) east of the Columbia River (Figure 5.2-1). The Wenatchee Watershed Management Plan (WRIA 45) was completed in April 2006 and addressed instream flows, water quantity, water quality, and habitat; an implementation plan was completed in 2008 (WWPU 2006 and 2008). The WRIA 40a Watershed Plan included analysis of water quantity and a multi-purpose water storage assessment (RH2 Engineering, Inc. 2007 and 2010). The Foster Creek (WRIA 50) and Moses Coulee (WRIA 44) watersheds chose to combine their watersheds for planning purposes. This Watershed Plan addressed instream flows, water quality, and habitat (DCWPA 2004).

Instream flows for the Columbia River were first established in 1980 by the Instream Resources Protection Program under the Ecology (WAC 173-563). This program provides seasonally variable instream flow targets for both minimum instantaneous flows and minimum average weekly flows to protect the natural environment, wildlife, fish, navigation, and scenic and aesthetic values (WSL 1982). The instream flows near the Rock Island Project are provided in Table 5.2-2.

Table 5.2-2 Instream Flows in the Columbia River Near the Rock Island Project

PERIOD	MINIMUM INSTANTANEOUS FLOWS (X 1,000 CFS)	MINIMUM AVERAGE WEEKLY FLOWS (X 1,000 CFS)	
	WELLS, ROCKY REACH, ROCK ISLAND PROJECT, AND WANAPUM DAMS	WELLS AND ROCKY REACH DAMS	ROCK ISLAND PROJECT AND WANAPUM DAMS
January	10	30	30
February	10	30	30
March	10	30	30
April 1-15	20	50	60
April 16-25	30	60	60
April 26-30	50	100	110
May	50	115	130

PERIOD	MINIMUM INSTANTANEOUS FLOWS (X 1,000 CFS)	MINIMUM AVERAGE WEEKLY FLOWS (X 1,000 CFS)	
	WELLS, ROCKY REACH, ROCK ISLAND PROJECT, AND WANAPUM DAMS	WELLS AND ROCKY REACH DAMS	ROCK ISLAND PROJECT AND WANAPUM DAMS
June 1-15	50	110	110
June 16-30	20	80	80
July 1-15	20	80	80
July 16-30	50	100	110
August	50	90	95
September	20	40	40
October 1-15	20	35	40
October 16-31	20	35	40
November	10	30	30
December	10	30	30

Source: WAC 173-563-040

The water quality standards for the Rock Island Project area are discussed in Section 5.2.5.

5.2.4.1 Surface Water Rights in Rock Island Reservoir

Ecology has jurisdiction over issuing permits for water use on the Columbia River in Washington state. Irrigation withdrawals are the largest consumptive use in the Rock Island Reservoir (Ecology 2021b). Apples, pears, and cherries were the top three crop types grown in Chelan County in 2017 (USDA 2017). The second-most common consumptive uses for surface water rights are commercial and industrial uses. Rock Island Reservoir is not used for municipal drinking water supply. Non-consumptive water right uses within the reservoir include fish propagation and power production.

5.2.4.2 Hydroelectric Project Water Rights

Chelan PUD currently holds water rights for various hydroelectric operational uses. It holds four surface water rights totaling 221,000 cfs for the generation of power (Table 5.2-3) and five reservoir water rights to impound 131,000 ac-ft of water. Chelan PUD holds four additional water rights necessary for operating the hydroelectric project for municipal, domestic, and industrial use, including fire protection and heat exchange (Table 5.2-4). Other Rock Island Project facilities have water rights for irrigation, domestic use, and fish propagation (Table 5.2-5).

Table 5.2-3 Summary of Surface Water Rights Allocated to the Rock Island Hydroelectric Project for Power Purposes

WATER RIGHT	PRIORITY DATE	PURPOSE	VOLUME (AC-FT)[1]	INSTANTANEOUS RATE (CFS)[1]
S4-*02466AHVCWRIS	November 28, 1928	Power	-	24,000
S4-*02857AHVCWRIS	February 21, 1930	Power	-	26,000
S4-*10182AHVCWRIS	March 10, 1951	Power	-	35,000
S4-24281CWRIS	May 3, 1976	Power	-	136,000
R4-*02465AHVCWRIS	November 28, 1928	Power	25,000	-
R4-*03762AHVCWRIS	December 7, 1932	Power	67,000	-
R4-*10183AHVCWRIS	March 10, 1951	Power	12,000	-
R4-*12231AHVCWRIS	April 7, 1953	Power	9,700	-
R4-24282	May 3, 1976	Power	17,300	-
Total			131,000	221,000

[1] ac-ft: acre feet; cfs: cubic feet per second
*Asterisk after the dash indicates it is from the "old" numbering system issued before the development of Water Resources Information System (WRIS).

Table 5.2-4 Summary of Water Rights Allocated to the Rock Island Project for Other Purposes

WATER RIGHT	PRIORITY DATE	PURPOSE	VOLUME (AC-FT)[1]	INSTANTANEOUS RATE (gpm)[1]
G4-CV1P3C	June 1930	Domestic General, Fire Protection, Heat Exchange	400	250
G4-*02385CWRIS	March 12, 1952	Domestic General, Heat Exchange	400	250
G4-22744CWRIS	March 8, 1974	Municipal	60.4	50
G4-24353CWRIS	July 19, 1976	Domestic Single, Commercial and Industrial	802	500
Total			1,662.4	1,050

[1]ac-ft: acre feet; gpm: gallons per minute
*Asterisk after the dash indicates it is from the "old" numbering system issued before the development of WRIS.

Table 5.2-5 Summary of Water Rights Allocated to Rock Island Project Facilities for Other Purposes

FACILITY*	WATER RIGHT/ SUPPLY	PURPOSE	VOLUME (AC-FT)[1]	INSTANTANEOUS RATE (gpm)[1]
Kirby Billingsley Hydro Park	G4-GWC6371-A(B)	Irrigation	29.8	134
	G4-GWC6371(A)(A1)	Temporary trust donation	29.8	134
	G4-27413	Domestic, Irrigation	53.5	135
	S4-SWC7786	Domestic, Irrigation	40	90
Wenatchee Riverfront Park	Regional Water Supply[2]	Irrigation and Domestic	--	--
Walla Walla Point Park	Regional Water Supply[2]	Irrigation and Domestic	--	--

FACILITY*	WATER RIGHT/ SUPPLY	PURPOSE	VOLUME (AC-FT)[1]	INSTANTANEOUS RATE (gpm)[1]
Wenatchee Confluence State Park	G4-112788CL	Irrigation	1,082.7	1,000
	G4-27767	Irrigation	296	800
	G4-30032	Irrigation	296	500
	S4-27766	Irrigation	92.5	0.5 cfs
	Regional Water Supply	Domestic		
Eastbank Hatchery	G4-29426	Fish propagation	28,959	17,956
	G4-29427	Fish propagation	10,860	6,734

*Coyote Dunes Natural Area does not have any water rights associated with the facility.
[1] ac-ft = acre feet; gpm = gallons per minute
[2]Use of the regional water supply (municipal water) does not require a water right.

5.2.4.3 Long-Term Supply Forecast

Every 5 years, the Ecology Office of Columbia River submits an updated long-term water supply and demand forecast to the Washington State Legislature (Hall et al. 2021). The forecast considers climatic, economic, and water management changes as three general categories of influence on future water use. Annual surface water supplies generated within the Washington portion of the Columbia River Basin are expected to increase approximately 2 percent (± 2 percent) by 2040, on average although this annual pattern includes a 14.9 percent (± 2.5 percent) increase in wet season (November-May) flows and a 28.5 percent (± 2.6 percent) decrease in dry season (June-October) flows. This increase in surface water supply was forecast to be matched by an increase in demand for hydropower energy and municipal water use due to forecasted population growth. In contrast, irrigation demand was forecast to decrease on average, which could alleviate the reduction in dry season water supply, at least in non-drought years.

5.2.5 Water Quality

Ecology and United States Environmental Protection Agency (USEPA) have promulgated the federally approved water quality standards under the CWA.

5.2.5.1 Applicable Federally Approved Water Quality Standards

Applicable designated uses and surface water quality criteria are defined in WAC Chapter 173-201A and 40 CFR § 131.45. The designated uses of the reach of the Columbia River in the Rock Island Project Boundary are the aquatic life use of salmonid spawning, rearing, and migration; primary contact recreation; water supply (domestic, agricultural, industrial, and stock watering); and the miscellaneous uses of wildlife habitat, fish harvesting, commerce and navigation, boating, and aesthetic values (WAC 173-201A-602: Columbia River). Table 5.2-6 summarizes the water quality standards for the Columbia River within the Rock Island Project Boundary.

Table 5.2-6 Summary of Applicable Federally Approved Water Quality Standards

PARAMETER	WATER QUALITY CRITERIA
Escherichia coli (E. coli)	*E. coli* organism levels within an averaging period must not exceed a geometric mean value of 100 colony forming units (CFU) or most probable number (MPN) per 100 milliliters (ml), with no more than 10% of all samples (or any single sample when less than 10 sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 ml (WAC 173-201A-200(2)(b)).
Dissolved Oxygen (DO)	Must equal or exceed 8.0 milligrams/liter (mg/l) (WAC 173-201A-200(1)(d) (2021)).[1]
pH	Within 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units (WAC 173-201A-200(1)(g)).
Total Dissolved Gas (TDG)	Not to exceed 110%. • The water quality criteria established in this chapter for TDG shall not apply when the stream flow exceeds the 7-day, 10-year frequency flood. • The TDG criteria may be adjusted to aid fish passage over hydroelectric dams that spill for anadromous juvenile fish as of the 2020 spill season. The elevated TDG levels are intended to allow increased fish passage without causing more harm to fish populations than caused by turbine fish passage. The following special fish passage exemptions for the Snake and Columbia rivers apply when spilling water at dams is necessary to aid fish passage: TDG must not exceed: • An average of 115% as measured in the forebays of the next downstream dams and must not exceed an average of 120% as measured in the tailraces of each dam (these averages are calculated as an average of the 12 highest hourly readings in a calendar day, relative to atmospheric pressure); and • A maximum TDG saturation level of 125% calculated as an average of the two highest hourly TDG measures in a calendar day during spillage for fish passage. To further aid fish passage during the spring spill season (generally from April through June), spill may be increased up to the following levels as measured at the tailrace fixed site monitoring location: • A maximum TDG saturation level of 125% calculated as an average of the 12 highest hourly TDG measures in a calendar day; and • A maximum TDG saturation level of 126% calculated as an average of any 2-consecutive hourly TDG measures. • These TDG criteria may be applied in place of (f)(ii)(A) of this subsection during spring spill operations when applied in accordance with the following conditions: In addition to complying with the requirements of this chapter, the tailrace maximum TDG criteria at hydropower dams shall be applied in accordance with ESA consultation documents associated with spill operations on the Snake and Columbia rivers, including

PARAMETER	WATER QUALITY CRITERIA
	operations for fish passage. The ESA consultation documents are those by which dams may legally operate during the time that the adjusted criteria in (f)(ii)(B) of this subsection are in use. Application of the tailrace maximum TDG criteria must be accompanied by a department approved biological monitoring plan designed to measure impacts of fish exposed to increased TDG conditions throughout the spring spill season. Beginning in the year 2021, plans must include monitoring for non-salmonid fish species and must continue for a minimum of 5 years, and thereafter as determined by the department. TDG must be reduced to allowances specified in (f)(ii)(A) of this subsection if the calculated incidence of gas bubble trauma in salmonids (with a minimum sample size of 50 fish required weekly) or non-salmonids (with a minimum sample size of 50y fish required weekly) exceeds: • Gas bubble trauma in nonpaired fins of 15%; or • Gas bubble trauma in nonpaired fins of 5% and gas bubbles occlude more than 25% of the surface area of the fin. If gas bubble trauma exceeds these biological thresholds, additional monitoring must demonstrate the incidence of gas bubble trauma below biological thresholds before TDG can be adjusted to allowances specified in this subsection. Gas bubble trauma monitoring data shall be excluded from comparison to biological thresholds when higher than normal river flow contributes to excess spill above the ability to meet (f)(ii)(B) of this subsection. This monitoring data exclusion shall apply for one full calendar day after reduced river flow allows attainment of (f)(ii)(B) of this subsection (WAC 173-201A-200(1)(f)).
Temperature	7-day average of the daily maximum temperature must not exceed 17.5°C[2] (63.5°F) (WAC 173-201A-200(1)(c)).
Turbidity	Not to exceed 5 nephelometric turbidity units (NTUs) over background, or 10% over background when background is more than 50 NTUs.

Source: WAC 173-201A-200

[1] Ecology adopted revised numeric criteria for the WAC-201A-200(1)(d) in March 2022. According to this, the DO numeric criteria is 10 mg/L or 90% saturation as a 1-day minimum; or an intragravel DO of 8 mg/L or greater and water column DO of 9 mg/L or greater as a 1-day minimum. These revised have not been approved by USEPA as of the time this PAD was prepared.

[2] In addition, when the criterion is met, temperature increases by individual point sources may not at any time exceed t = 28/(T + 7), where "T" represents the background temperature.

5.2.5.2 Water Quality Impairments and Improvement Programs

Washington State's current water quality assessment under the CWA 305(b) Report and 303(d) List of Impaired Waters was based on data collected between 2006 and 2017 and was approved by the USEPA on August 26, 2022 (Ecology 2022a and 2022b) (Table 5.2-6, Table 5.2-7, Figure 5.2-9 and Figure 5.2-10). The CWA requires a total maximum daily load (TMDL) for waterbodies listed on the 303(d) list.

The Columbia River within the Rock Island Project Boundary is listed as impaired for temperature, TDG, and the toxic contaminants 4,4'- dichlorodiphenyl dichloroethane (DDD), 4,4'-dichlorodiphenyl dichloroethylene (DDE), polychlorinated biphenyls (PCBs) and methyl mercury (Ecology 2022a). The reach of the Wenatchee River near the confluence with the Columbia River is listed as impaired for pH, temperature, DDE, and PCBs. Hammonds Pond and Putters Pond are listed as impaired for total phosphorus. Putters Pond and Pit Pond are listed as Category 4C (impaired but does not require a TMDL because the impairment is not due to a pollutant) for non-native aquatic plants. The active TMDLs that are presently in effect to address the impairments in the Columbia and Wenatchee Rivers are shown in Table 5.2-7 and are discussed further subsequently. Not all these TMDLs are associated with specific impairment listings within the Rock Island Project Boundary (Table 5.2-7).

Table 5.2-7 Washington State Water Quality Impairments (2018) in the Rock Island Project Boundary

WATERBODY	ASSESSMENT UNIT(S)	PARAMETER	MEDIUM	IMPAIRMENT STATUS (2018)
Columbia River	Between Rocky Reach Dam and the Wenatchee River; between Squilchuck Creek and Colockum Creek	Temperature	Water	Category 4a — impaired but has an USEPA-approved TMDL in place.
Columbia River		TDG	Water	Category 4a — impaired but has an USEPA-approved TMDL in place.
Columbia River		PCBs	Tissue	Category 5: impaired and requires a TMDL
Columbia River	Between Rocky Reach Dam and the Wenatchee River; between Squilchuck Creek and Rock Island Dam	4,4’-DDD	Tissue	Category 5: impaired and requires a TMDL
Columbia River		4,4’-DDE	Tissue	Category 5: impaired and requires a TMDL
Columbia River	Between Rocky Reach Dam and the Wenatchee River; between Rock Island Dam and Colockum Creek	Methyl Mercury	Tissue	Category 5: impaired and requires a TMDL
Wenatchee River	From confluence with Columbia River upstream approximately 1 mile	pH	Water	Category 4a — impaired but has an USEPA-approved TMDL in place
Wenatchee River		Temperature	Water	Category 4a — impaired but has an USEPA-approved TMDL in place
Wenatchee River		4,4'-DDE	Tissue	Category 5: impaired and requires a TMDL
Wenatchee River		PCBs	Tissue	Category 5: impaired and requires a TMDL

WATERBODY	ASSESSMENT UNIT(S)	PARAMETER	MEDIUM	IMPAIRMENT STATUS (2018)
Hammonds Lake	NA	Total Phosphorus	Water	Category 5: impaired and requires a TMDL
Putters Pond, South	NA	Total Phosphorus	Water	Category 5: impaired and requires a TMDL
Putters Pond	NA	Non-native Aquatic Plants	Water	Category 4c — impaired but does not require a TMDL because the impairment is not due to a pollutant
Pit Pond	NA	Non-native Aquatic Plants	Water	Category 4c — impaired but does not require a TMDL because the impairment is not due to a pollutant

Source: Ecology 2022a
DDD = dichlorodiphenyl dichloroethane; DDE = dichlorodiphenyl dichloroethylene; PCB = polychlorinated biphenyl; TMDL = total maximum daily load; USEPA = United States Environmental Protection Agency

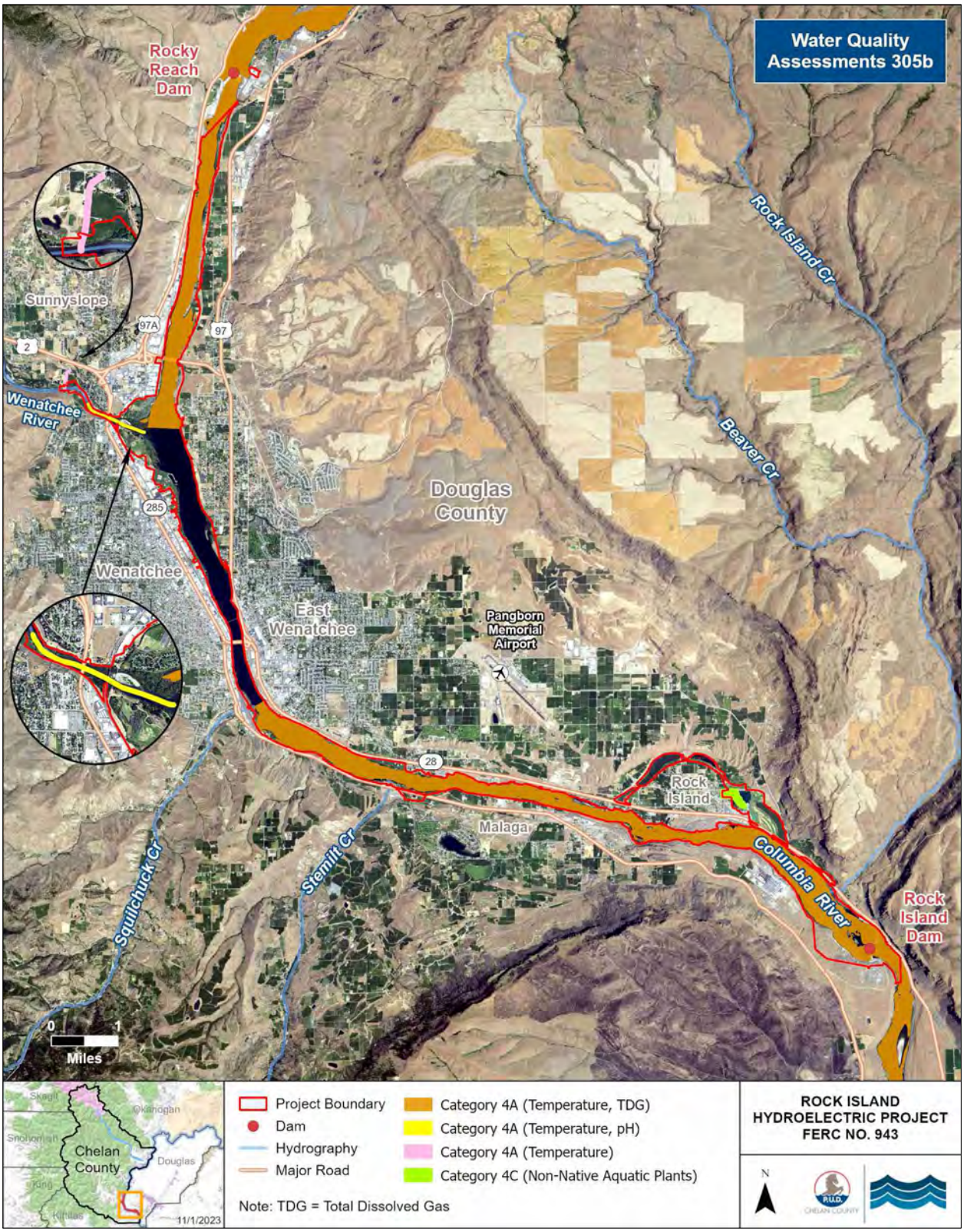


Figure 5.2-9 Category 4 Water Quality Assessments in the Vicinity of the Rock Island Project

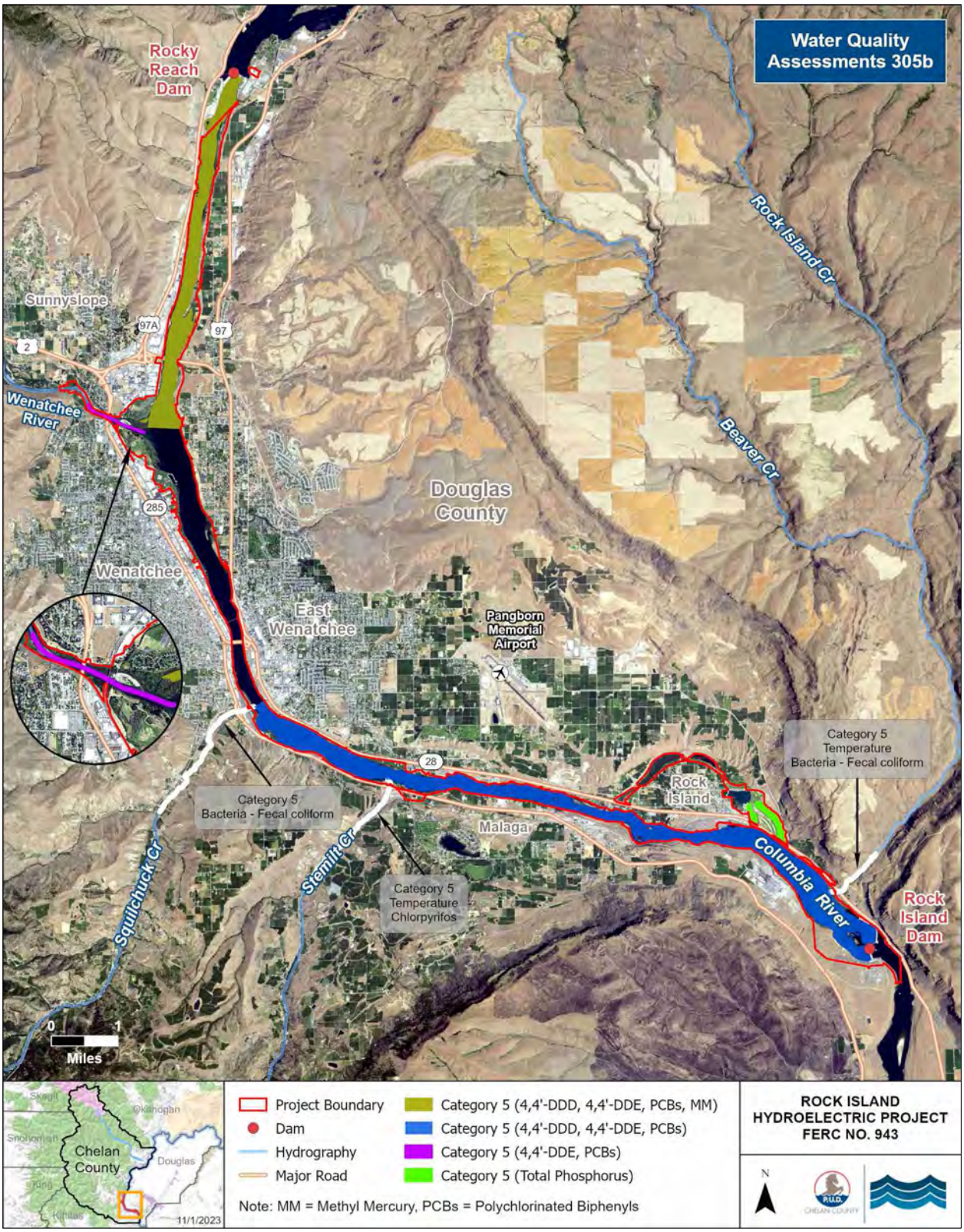


Figure 5.2-10 Category 5 Water Quality Assessments in the Vicinity of the Rock Island Project

Total Maximum Daily Load for Temperature in the Columbia and Lower Snake Rivers (2021)

USEPA has developed a temperature TMDL for the Columbia River from Canadian border to its mouth, and the lower Snake River from Washington-Idaho border to its confluence with the Columbia River (USEPA 2021). The TMDL was developed to address exceedances of state and tribal water quality criteria for temperature that protect salmonid and steelhead migration. The TMDL identified June – October as the critical period when these exceedances occur. The TMDL examined the influence of climate change, dams, tributaries, point sources, stormwater, upstream boundary temperature (from Canada and Idaho), and withdrawals from Banks Lake Project and Dworshak Dam and identified that climate change and nonpoint-source heat from dams are the dominant sources of temperature impairments. USEPA's assessment was based on an RBM-10 temperature model, temperature data from the Columbia River Data Access in Real Time (DART) system, and literature (USEPA 2021).

The TMDL provides heat load allocations for tributaries, point and nonpoint sources based on a "measurable change" of 0.3°C (0.54°F) in Washington State Water Quality Standards (WAC 173-201A-320[3][a]) and a "human use allowance" of the same magnitude defined in the Oregon Water Quality Standards (OAR 340-041-0028(12)(b)(B)). USEPA interpreted these provisions as the maximum allowable cumulative human temperature increase above the applicable numeric criterion at any given location.

For the Rock Island Project, this translates to a 7-day average of the daily maximum (DADM) temperature target of 17.8°C ([64.04°F], i.e., 17.5°C [63.5°F] temperature criterion for salmonid spawning, rearing and migration plus 0.3°C [0.54°F]) measurable change allowed under Washington Water Quality Standards). This target applies at all locations within the Rock Island Project. In the Rock Island Project tailrace, the TMDL identified measured exceedances of the temperature target ranging from 0.2°C (0.36°F) in June to 3.1°C (5.58°F) in September (USEPA 2021).

USEPA divided the 0.3°C (0.54°F) allocation equally among current and future point sources, dam sources and tributaries. The TMDL presented a modeling analysis to assess whether the cumulative impacts from dams caused an exceedance over the temperature target at each of the project tailraces addressed by the TMDL. Based on this analysis the TMDL identified no cumulative dam impact at the Rock Island tailrace for June, July and August, and a cumulative impact of 1.6°C (2.88°F) in September and 3.5°C (6.3°F) in October. The TMDL modeling also identified the contribution of individual Columbia River Project reaches to the cumulative temperature changes. Based on this analysis, the Rock Island Project reach was estimated to contribute to heating only in August (by a value of 0.1°C [0.18°F]. During June, July and September the Rock Island Project reach was modeled to not cause any additional heating, and during October it was modeled to

produce a cooling of 0.1°C (0.18°F). The TMDL also provided thermal waste load allocations for 13-point sources that discharge within the Rock Island Project area, including Rock Island Dam.

Ecology will implement the load allocations in the TMDL for the Rock Island Project. Ecology is presently in the process of developing an implementation plan that will provide its strategy and next steps on how the load and waste load allocations identified in the TMDL will be implemented. The heat load allocation of 0.1°C (0.18°F) applicable to tributaries that discharge into the Rock Island Project area will be addressed by Ecology through the implementation of tributary TMDLs or other temperature controls.

Total Maximum Daily Load for Total Dissolved Gas in the Mid-Columbia River and Lake Roosevelt (2004)

In 2004, Ecology established a TDG TMDL for the Mid-Columbia River from the Canadian border to the Snake River confluence to address elevated TDG levels caused by spill events (Pickett et al. 2004). The TMDL set TDG loading capacities and allocations for the Mid-Columbia River and Lake Roosevelt, both in terms of percent of saturation for fish passage-related spills and as excess pressure above ambient barometric pressure during non-fish passage conditions. WAC 173-201A-200(1)(f)(ii) allows Ecology to temporarily adjust TDG criteria to aid downstream migrating juvenile fish.

The TMDL allocations for the Rock Island Project require TDG to be below an average of 120 percent saturation based on the average of 12 highest hourly readings in a 24-hour period and a one-hour maximum of 125 percent saturation during fish passage, and 2.91 in. above saturation at ambient barometric pressure during non-fish passage conditions. The application of the higher TDG saturation standard during fish passage requires an Ecology-approved Gas Abatement Plan (GAP). The fish passage TDG saturation criteria were increased to allow spill for juvenile fish passage from April through June (see Table 5.2-6). The TDG allocations and criteria do not apply when flows exceed the 7Q10 flow, which was calculated in the TDG TMDL as 264,000 cfs in the Rock Island Project tailrace.

Chelan PUD has submitted annual GAPs requesting criteria adjustments during the fish spill period of April 1 to August 31 since 2009.

Total Maximum Daily Loading to Limit Discharges of 2,3,7,8-TCDD to the Columbia River Basin (1991)

In 1991 USEPA developed a TMDL for dioxin for the entire Columbia River Basin (USEPA 1991). The TMDL identified chlorine-bleaching pulp mills as a major source of dioxin and established

wasteload allocations for the eight mills in the basin. None of the pulp mills identified in the TMDL are near the Rock Island Project.

Wenatchee River Watershed Dissolved Oxygen and pH Total Maximum Daily Load (2009)

In 2004, Ecology analyzed data from 2002 and 2003 to assess the causes of violations of state water quality standards for dissolved oxygen (DO) and pH that typically occur during seasonally low stream flows in the Wenatchee watershed (Carroll and Anderson 2009). The analysis identified phosphorus as the limiting nutrient in Icicle Creek and the lower Wenatchee River. The TMDL concluded that phosphorus must be reduced to improve DO and pH levels in the lower Wenatchee River. Point sources of phosphorus included wastewater treatment plants and fish hatcheries whereas nonpoint sources were diffuse and included leaking septic systems. The Wenatchee River DO and pH TMDL is provided here for context of relevant TMDLs within the tributaries discharging to the Rock Island Project. The TMDL is not associated with specific impairment listings within the Rock Island Project Boundary.

Wenatchee River Watershed Temperature Total Maximum Daily Load (2005)

In 2004, Ecology analyzed data from the Wenatchee watershed from 2001 to 2003 to assess the causes of exceedances of state water quality standards for stream temperature that typically occur during seasonally low stream flows (Cristea and Pelletier 2005). The analysis identified protection and enhancement of riparian vegetation as a measure to improve stream temperatures in the watershed.

5.2.5.3 Existing Water Quality Data

Information on water quality in the Rock Island Reservoir is available from several sources including:

- Ecology's Statewide River and Stream Ambient Monitoring at the following sites (Ecology 2021c):
    - Columbia River at Highway 2 Bridge (2005 to 2006);
    - Columbia River below Rock Island (1977 to 1990);
    - Wenatchee River at Wenatchee (1960 to present); and
    - Squilchuck Creek at Mouth (2015 to 2016).
- Fixed Monitoring Stations (FMSs) maintained by Chelan PUD in coordination with the USACE at the following sites:
    - Rocky Reach tailrace;
    - Rock Island forebay; and

- Rock Island tailrace.

These data are available from the Columbia River DART system. Flow, temperature and TDG are also available at the Wanapum Dam forebay DART station.

Additional information sources include studies performed to support TMDL development in the Wenatchee River and relicensing of the Rocky Reach Project. Regional data for the Mid-Columbia River were also reviewed to provide background descriptions of water quality. In addition, Chelan PUD conducted water quality monitoring in 2022 and 2023 in the Rocky Reach tailrace, Rock Island forebay, and Rock Island tailrace (see Appendix G.1) (Four Peaks 2023b).

Fixed Monitoring Stations

Chelan PUD maintains two FMSs at the Rock Island Project (Figure 5.2-1) (Chelan PUD 2021a). The FMSs collect TDG and temperature measurements and are installed to a depth of approximately 15 ft, although this depth varies as the forebay and tailrace river elevations fluctuate with river flows. The Rock Island forebay FMS is in a standpipe located on the west side of the river, near the right bank fishway and Powerhouse 2, approximately 70 ft from the shore (Figure 5.2-1). Chelan PUD operates a monitoring station approximately 1.5 miles downstream from Rock Island Dam on the eastern shoreline (Figure 5.2-1).

FMS water quality data are recorded at 15-minute intervals and then averaged into hourly readings for use in daily and 12-hour averages, as well as daily high values. The hourly average data is forwarded to the USACE, Columbia River Basin Water Management Division. The USACE publishes the raw data as part of its DART information system (DART 2023).

Temperature[22]

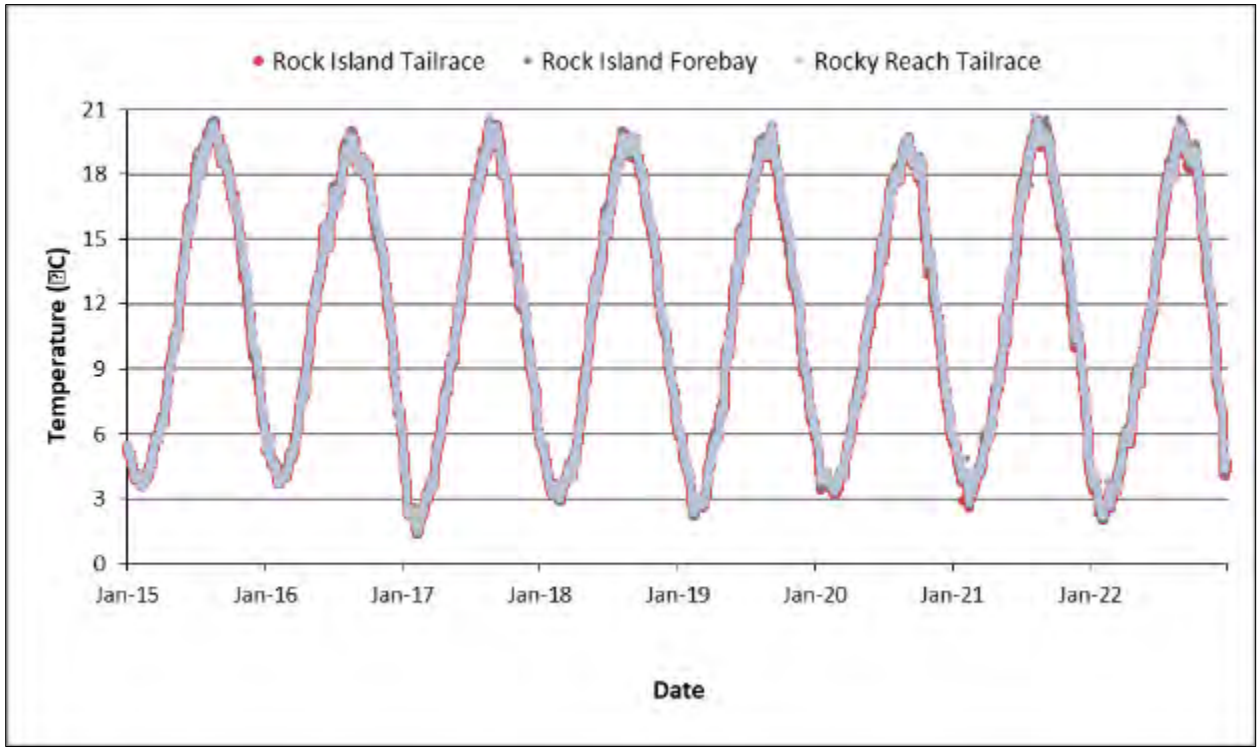
Chelan PUD collects continuous water temperature data at its FMS in the forebay and tailrace of Rocky Reach Dam and Rock Island Dam. Temperature data (Figure 5.2-11) were reviewed and corrected for anomalies using a combination of automated checks for extreme temperatures and visual comparisons against air temperature, adjacent monitoring locations and across multiple years.

Columbia River water temperatures in the Rock Island Project Boundary begin warming in March and reach peak annual temperatures in August and September between 18°C (64.4°F) and 21°C ([69.8°F], Figure 5.2-11 and Table 5.2-8). In October, temperatures begin to cool again and drop

[22] Water temperatures are expressed in degrees Celsius (°C) with degrees Fahrenheit (°F) provided in parentheses.

into the 3°C (37.4°F) to 5°C (41°F) range by January (Figure 5.2-11). Daily variability is typically less than 0.5°C (1.62°F) but can range as high as 1°C (1.8°F) diurnally.

Temperature appears to change very little as water flows through Rock Island Reservoir and Rock Island Dam. The average difference in the absolute values for temperature differences between the Rocky Reach tailrace and the Rock Island tailrace (2015 to 2022) was 0.2ºC (0.36°F). The run-of-river operation of the Rock Island Project results in short residence times that largely preclude stratification and limit the potential for warming to occur (NMFS 2002). Vertical profiles collected in the Rock Island forebay in 2022-2023 reflect fully mixed conditions during all sampling events (see Appendix G.1) (Four Peaks 2023b).



Source: DART 2023

Figure 5.2-11 Hourly Temperature at Fixed Monitoring Stations in the Rock Island Project Boundary (2015 to 2022)

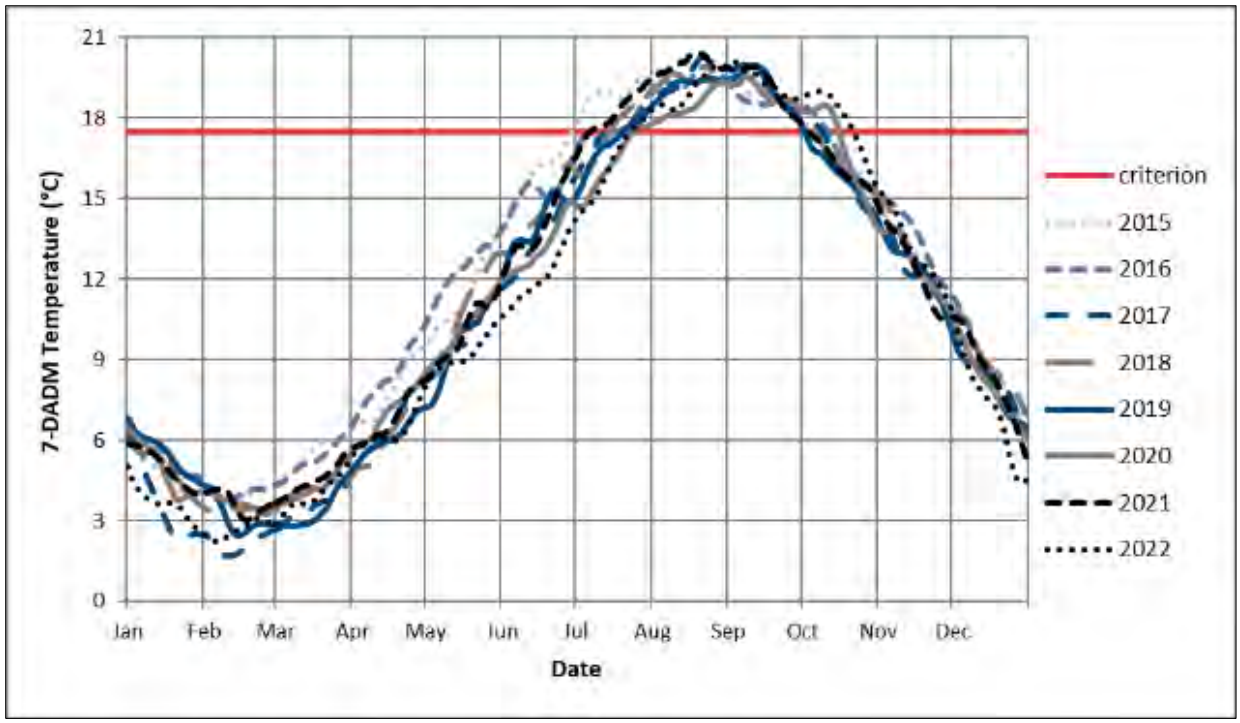
Table 5.2-8 Summary of Hourly Temperature Observations by Month in the Tailrace of Rock Island Dam (2015-2022)

MONTH	TEMPERATURE °C (°F)			
	MEAN	MINIMUM	MAXIMUM	NUMBER OF OBSERVATIONS
January	4.4 (39.9)	2.2 (36.0)	6.3 (43.4)	5,822
February	3.2(37.8)	1.4 (34.5)	4.6(40.2)	5,414
March	4.4 (39.9)	2.6 (36.7)	6.7 (44.1)	5,890
April	7.0 (44.6)	4.8 (40.6)	10.7 (51.3)	5,747
May	10.6 (51.0)	7.0 (44.5)	14.3 (57.8)	5,906
June	14.2 (57.5)	10.5 (50.9)	18.0 (64.4)	5,669
July	17.5 (63.4)	14.0 (57.2)	20.0 (67.9)	5,940
August	19.3 (66.8)	17.6 (63.7)	20.5 (68.9)	5,940
September	18.8 (65.9)	16.8 (62.2)	20.3 (68.6)	5,720
October	16.2 (61.2)	13.2 (55.8)	19.1 (66.4)	5,931
November	12. 3 (54.1)	9.1 (48.4)	15.1 (59.2)	5,587
December	7.8 (46.1)	4.1 (39.4)	10.9 (51.6)	5,660

Source: DART 2023

The 7-DADM criterion is typically initially exceeded sometime in July, with sustained exceedances in August and September; water temperatures meet the criterion from mid-October through mid-June (Figure 5.2-12). The 2021 Columbia and Lower Snake River temperature TMDL estimated that during the June-October period between 2011 and 2016, temperatures at the Rock Island Dam tailrace monitoring station exceeded criteria an average of 74 days per year, or 20 percent of the time with an average exceedance of 1.4°C (2.52°F) and a maximum exceedance of 2.4°C (4.32°F) (USEPA 2021). The temperature TMDL determined that the temperature exceedances originate in Canada with an average of 1.8°C (3.24°F) above the 7-DADM criterion of 16°C (60.8°F) at the international border. These exceedances at the border occurred on average 78 days or 21 percent of the time over the June – October period. The 17.5°C (63.5°F) 7-DADM criterion begins at Grand Coulee Dam and continues until Priest Rapids Dam. The 17.5°C (63.5°F) 7-DADM temperature criterion was not met at each subsequent tailrace monitoring stations for 62 days, 83 days, 80 days, 74 days, and 80 days on average at Grand Coulee, Wells, Rocky Reach, Rock Island and Wanapum dams, respectively (USEPA 2021). Chief Joseph Dam tailrace exceeded the 17.5°C [63.5°F] 7-DADM criterion on average 64 days, but the TMDL noted that the dataset was incomplete at that location and therefore not included in the list above). These data, in conjunction with the earlier observation that temperature changes within the Rocky Reach to Rock Island tailrace is 0.2°C (0.36°F) or less, are consistent with the TMDL's determination that exceedances predominantly originate upstream, and the 17.5°C (63.5°F) 7-DADM criterion is

largely not met over the June-October critical period in the Mid-Columbia projects downstream of Grand Coulee Dam, and these exceedances are not unique to the Rock Island Project.



Source: DART 2023

Figure 5.2-12 7-DADM Temperature in the Tailrace of Rock Island Dam (2015 to 2022)

The major facility[23] National Pollutant Discharge Elimination System (NPDES) point sources discharging directly to the Rock Island Reservoir with an allocation for temperature impacts include the city of Wenatchee, East Wenatchee Sewage Treatment Plant, and Alcoa Wenatchee (USEPA 2020), although Alcoa closed its Wenatchee Works facility in 2015. Several minor facilities also discharge into the Rock Island Project Boundary (Table 5.2-9). Of these, Chelan PUD owns Rock Island Dam and Eastbank Hatchery.

[23] Major municipal dischargers include all facilities with design flows of greater than 1 million gallons per day and facilities with USEPA/state-approved industrial pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by USEPA or are classified as such by USEPA in conjunction with the state (USEPA 1996).

Table 5.2-9 Waste Load Allocations for Point Source Discharges to the Columbia River in the Rock Island Project Boundary

FACILITY NAME	PERMIT NUMBER	LOCATION (RM)	FLOW (MILLION GALLONS PER DAY)	TEMP (°C/°F)	WASTE LOAD ALLOCATIONS (KCAL/DAY)
MAJOR FACILITIES					
Wenatchee Publicly Owned Treatment Works	WA0023949	466.6	5.5	26.2 (79.16)	5.44E+08
E Wenatchee Sewage Treatment Plant	WA0020621	465.7	3.0	26.2 (79.16)	2.97E+08
Alcoa Wenatchee	WA0000680	455.2	5.5	25.6 (78.08)	5.31E+08
MINOR FACILITIES					
Stemilt Growers Euclid	WAG435172		0.1	26.1 (78.98)	9.87E+06
Stemilt Growers Olds Station 2	WAG435157	--	0.1	21.3 (70.34)	8.05E+06
Eastbank Hatchery	WAG135011	--	29.5	17.5 (63.5)	1.95E+09
Tree Top Inc. Wenatchee	WA0051527	470.8	0.18	26.6 (79.88)	7.03E+07
Naumes Processing / Keyes Fibre Corp	WA0051811	470.5	1.4	24.7 (76.46)	1.32E+08
Lineage Logistics	WA0052400	466.8	1.9	24.7 (76.46)	1.74E+08
KB Alloys/AMG Aluminum North America	WA0002976	458.5	0.3	40 (104)	4.53E+07
Specialty Chemical	WA0002861	456.3	0.35	16.1 (60.98)	2.13E+07
Rock Island Dam	WA0501487	455.9	0.34	20.5 (68.9)	2.62E+07
Rock Island Dam	WA0991032	453.5	26.9	26.0 (78.8)	2.64E+09

Source: USEPA 2021

Total Dissolved Gas

TDG supersaturation[24] occurs when air, entrained by water passing over spill gates or a dam, is carried to depth by the plunging action of the spill and forced into solution by increased hydrostatic pressure (Perleberg and McDonald 2000). TDG supersaturation in the Columbia River was identified in the 1960s and 1970s as a potential detriment to salmon (NWPPC 2004). The impact of TDG supersaturation has been of concern as fish management agencies have reinstituted spill as a means of aiding downstream fish passage throughout the Columbia River hydropower system (NWPCC 2004).

[24] TDG is measured in percent saturation.

The vast majority of elevated TDG levels in the Columbia River are caused by spill from dams; anthropogenic sources other than spill can be considered negligible (Pickett et al. 2004). Spill is necessary when flows in the river exceed the hydraulic capacity of the hydropower projects. During periods of high flows, most projects spill because the hydraulic capacity is often exceeded. In addition, water is spilled to aid downstream passage of juvenile salmonids in spring and early summer, which often also coincides with the high flow period. Thus, similar to temperature, higher TDG originates upstream as the effect of spill propagates downstream at each successive dam during the high flow periods in spring and early summer when water is spilled for downstream fish passage or due to operational reasons.

Ecology has established a TDG TMDL for the Mid-Columbia River, which specifies the TDG saturation levels for the Rock Island forebay and tailrace, and at the Wanapum Dam forebay, which is the downstream compliance point for the Rock Island Project (Pickett et al. 2004). The TDG load allocations in the TMDL and the criteria listed in Table 5.2-6 do not apply when the flows in the Columbia River exceed the 7Q10 high flow, which was calculated in the TDG TMDL as 264,000 cfs in the Rock Island Project tailrace (Pickett et al. 2004).

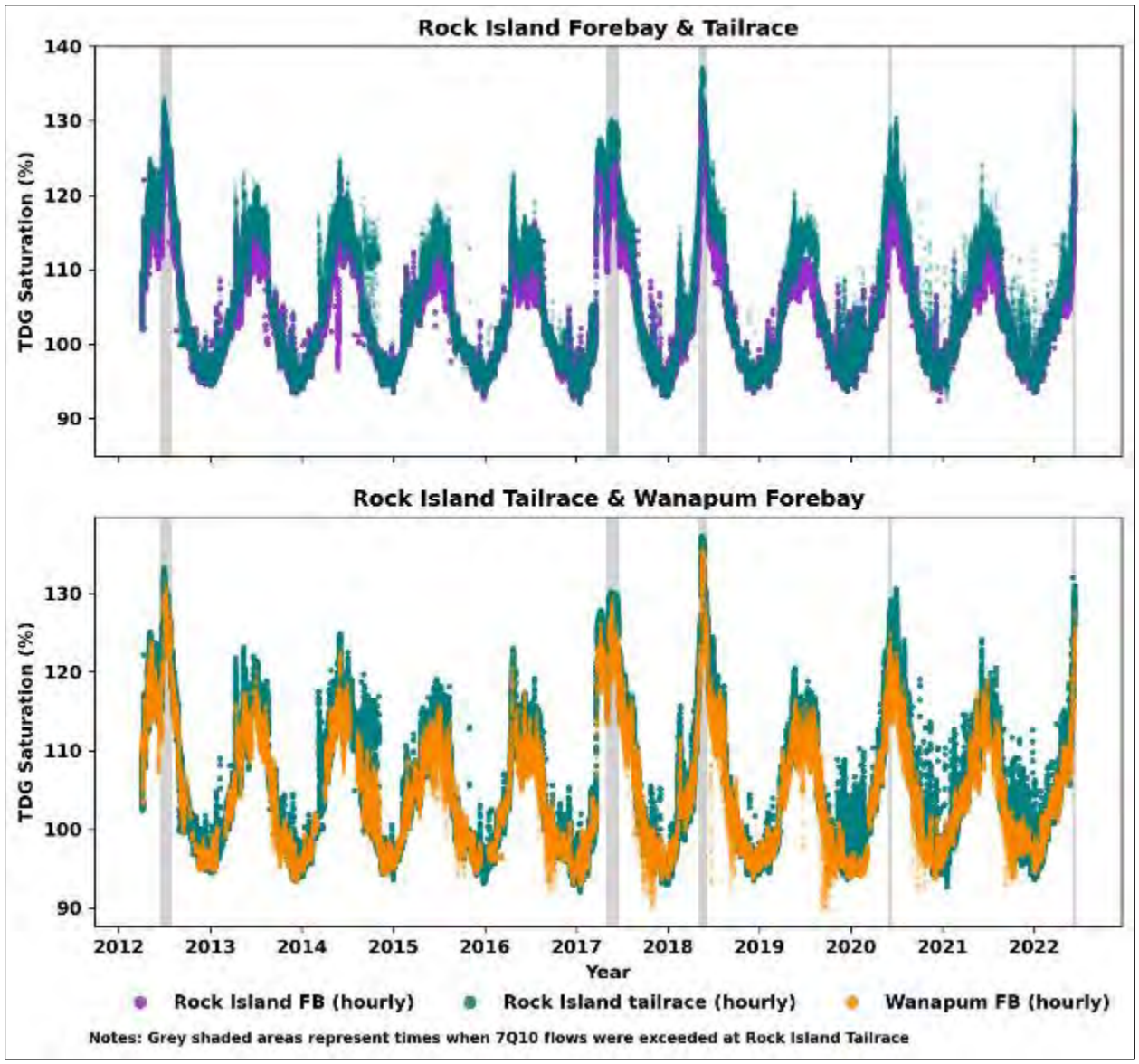
The TDG TMDL also outlined actions undertaken by Chelan PUD to limit TDG supersaturation, including installation of prototype deflectors in Bay 29 and Bay 16, in 2000 and 2001, respectively. As part of the implementation of the TDG TMDL and following the revisions to the TDG standards to allow higher TDG levels to support downstream juvenile passage Chelan PUD submits an annual GAP for the Rock Island Project to utilize the fish spill exemption for the April 1 through June 30 period per WAC 173-201A-200(1)(f)(ii)(B) and from July 1 to August 31 period per WAC 173-201A-200(1)(f)(ii)(A) (see Table 5.2-6). Chelan PUD has submitted these annual GAPs to Ecology from 2009 to 2022 (Chelan PUD 2009, 2012, 2016, 2017, 2018, 2019b, 2020, 2021b and 2022a). The GAPs outline the operational measures that Chelan PUD implements each year to minimize TDG supersaturation. These measures include minimizing voluntary spill, scheduling maintenance to avoid high flow periods, and maximizing the hydraulic capacity of the powerhouses to reduce non-fish spill. The annual GAPs also outline compliance monitoring at the FMS at the Rock Island Project forebay and the tailrace, and biological monitoring for gas bubble trauma. Additionally, in 2005 and 2007, Chelan PUD installed a modified, double set of gates, known as over/under gates, in spillway bays 30, 31, and 32 to reduce TDG in spill (see Section 4.4.1).

Chelan PUD collects continuous TDG data at the same FMS that monitor temperature in the forebay and tailrace of Rocky Reach and Rock Island dams (Figure 5.2-1). Continuous TDG data are also available at the Wanapum Dam forebay. These data are all publicly available from the Columbia River DART information system (DART 2023).

Hourly and twelve-hour rolling average TDG at the Rock Island Dam forebay, Rock Island Dam tailrace and the Wanapum Dam forebay FMSs are presented in Figure 5.2-13 and Figure 5.2-14, respectively. The FMS data were obtained from DART, reviewed, and corrected for anomalies using a combination of automated checks for extreme values (+/- 3 percent difference in TDG saturation between successive readings) and visual comparisons against adjacent monitoring locations. Each panel in Figure 5.2-13 and Figure 5.2-14 show the paired upstream and downstream locations to illustrate correlations. These figures show that TDG levels in the Mid-Columbia River are highly correlated from upstream to downstream. At all three locations TDG concentrations begin to increase as temperature and flows increase in April and reach peak annual saturation in May and June, above 120 percent saturation in some years. The figures also show the periods when 7Q10 high flows were exceeded at the Rock Island Dam tailrace in gray. Higher TDG saturation is evident during the periods when the 7Q10 high flows are exceeded. In late July and August, TDG begins to drop below 110 percent saturation and reaches lows between 90 percent and 100 percent saturation in the late fall and winter months.

Figure 5.2-15 shows the distributions of the TDG at the Rock Island Dam forebay and tailrace, and at the Wanapum Dam forebay. This figure illustrates that nearly 95 percent of the TDG measurements remain below 120 percent saturation at the Rock Island Dam tailrace, and over 90 percent of the measurements remain below 115 percent saturation at the forebay of Wanapum Dam (the downstream compliance point for the Rock Island Project). Over 95 percent of the TDG data were below 120 percent and 115 percent at the Rock Island Dam tailrace and the Wanapum Dam forebay, respectively when the TDG measurements during periods when the 7Q10 high flow was exceeded were removed (top panels of Figure 5.2-15).

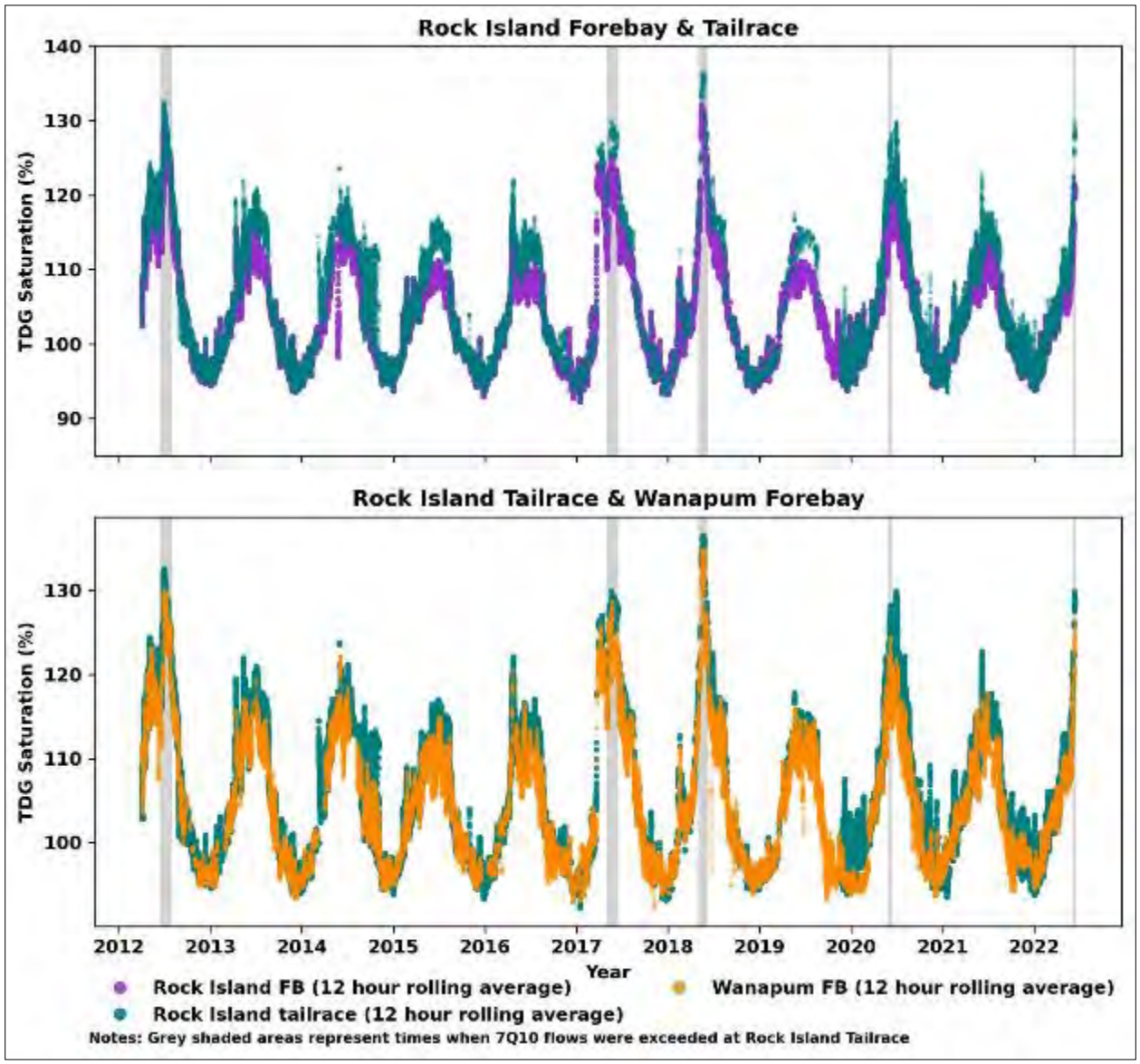
Chelan PUD performs annual evaluations of these TDG data and summarizes compliance with the TDG criteria in the Total Dissolved Gas Annual Reports (Chelan PUD 2009, 2012, 2016, 2017, 2018, 2019b, 2020, 2021b and 2022). Starting in 2021, results of the biological monitoring were presented in the Annual Biological Monitoring Plan (Chelan PUD 2021b, 2022b, and 2023).



Source: DART 2023

Notes: TDG data were only intermittently collected from 2009 – 2011 and are not presented here. Data for Rock Island Dam tailrace were not available past June 2022. Shaded gray areas show periods when 7Q10 flow was exceeded at the Rock Island Dam tailrace.

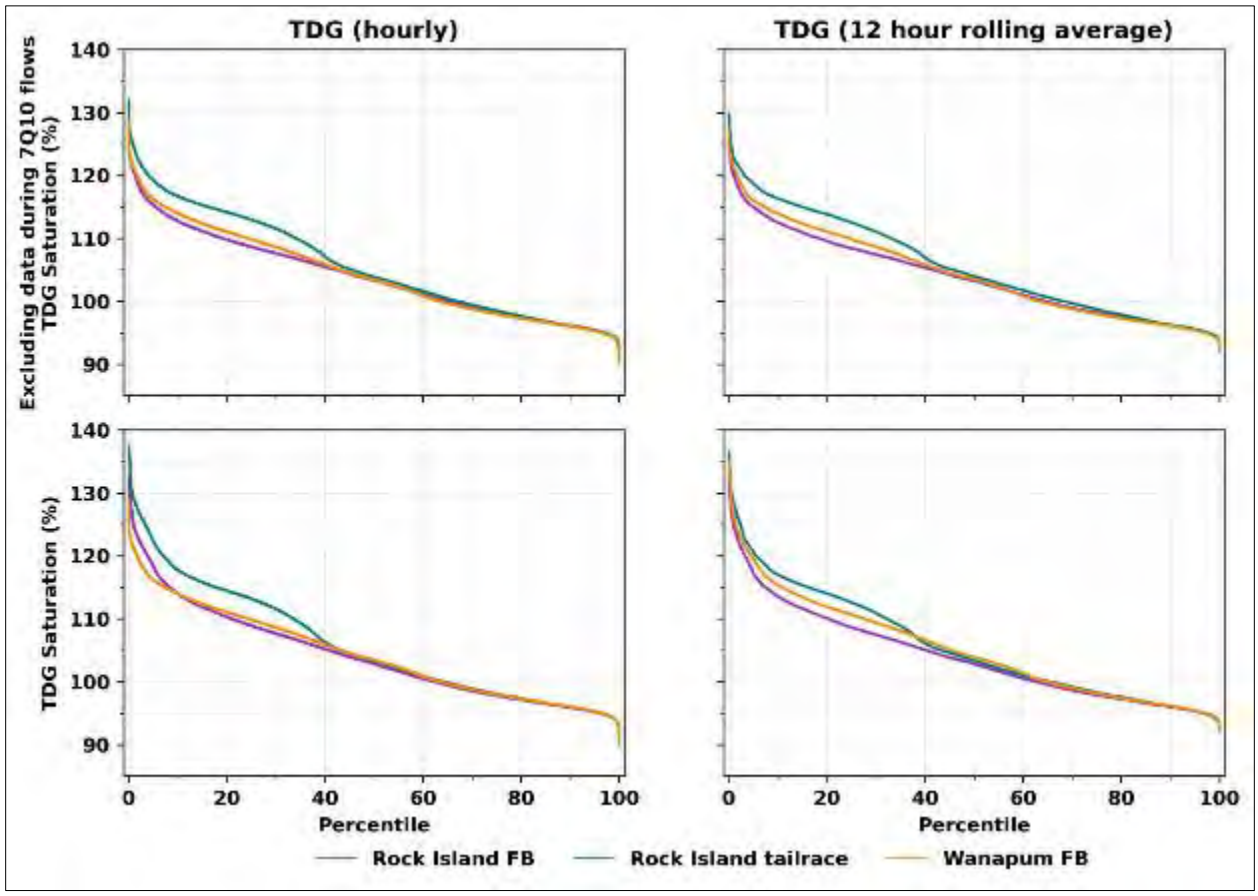
Figure 5.2-13 Hourly Total Dissolved Gas Saturation at the Fixed Monitoring Stations in the Forebay and Tailrace of Rock Island Dam and the Forebay of Wanapum Dam (2012 to 2022)



Source: DART 2023

Notes: TDG data were only intermittently collected from 2009 – 2011 and are not presented here. Data for Rock Island Dam tailrace were not available past June 2022. Shaded gray areas show periods when 7Q10 flow was exceeded at the Rock Island Dam tailrace.

Figure 5.2-14 12-Hour Rolling Average Total Dissolved Gas Saturation at the Fixed Monitoring Stations in the Forebay and Tailrace of Rock Island Dam and the Forebay of Wanapum Dam (2012 to 2022)



Source: DART 2023
Notes: TDG data were only intermittently collected from 2009 – 2011 and are not presented here. Data for Rock Island Dam tailrace was not available past June 2022.

Figure 5.2-15 Distributions of Hourly and 12 Hour Rolling Average Total Dissolved Gas Saturation at the Fixed Monitoring Stations in the Forebay and Tailrace of Rock Island Dam and the Forebay of Wanapum Dam (2012 to 2022)

Dissolved Oxygen[25]

DO concentrations are affected by both physical and biological processes. Air bubble entrainment adds oxygen as a proportion of TDG, and cold water can hold more DO in solution than warm water. Photosynthesis and the respiration cycle of aquatic plants cause diurnal fluctuations in DO; senescence of aquatic macrophytes and decomposition of organic matter mediated by bacterial respiration consumes oxygen. Within the Mid-Columbia River projects, water velocities are generally fast enough to prevent thermal stratification and the associated depletion of oxygen in deeper waters (NMFS 2002). Occasional DO concentrations below the standard may occur when

[25] DO is measured in milligrams per liter (mg/L) or percent oxygen saturation.

hot weather coincides with irrigation withdrawals, low flows, and irrigation return flows containing high levels of nutrients and organic matter (NMFS 2002).

Historic DO monitoring in the Rock Island Project Boundary is limited to Ecology's Statewide River and Stream Ambient Monitoring at the Columbia River below Rock Island (1977 to 1990) and the Columbia River at Highway 2 Bridge (2005 to 2006; Ecology 2021c). DO levels met the federally approved standard of a daily minimum DO of 8.0 milligrams per liter (mg/L) (Table 5.2-10 and Table 5.2-11). Monthly average DO ranged from 10.1 mg/l to 13.9 mg/L (1977 to 1990) and 9.1 to 13.7 mg/L (2005 to 2006).

Monitoring in 2022 and 2023 by Chelan PUD documented DO concentrations frequently below the 10 milligrams per liter (mg/L) criterion for daily minimum DO when temperatures exceeded criteria (see Appendix G.1) (Four Peaks 2023b). However, all locations were above the alternative 90 percent DO saturation criterion on all the sampling dates, indicating the potential effects of water temperature on DO concentrations. DO concentrations increased between the Rocky Reach tailrace and the Rock Island tailrace during each sampling event (see Appendix G.1) (Four Peaks 2023b).

Table 5.2-10 Average Values for Water Quality Monthly Grab Samples at Ecology Monitoring Station Below Rock Island Dam (1977 to 1990) (1 of 2)

MONTH	MEAN FLOW (CFS)	MEAN TEMP (°C/°F)	DISSOLVED OXYGEN (MG/L)	OXYGEN SATURATION (PERCENT)	PH	TURBIDITY (NTU)	CONDUCTIVITY (UMHO/CM)[1]	FECAL COLIFORM (MFM-FCBR)[2] (PER 100 ML)	TOTAL SUSPEND SOLIDS (MG/L)
January	135,425	3.6 (38.48)	12.9	98.3	7.9	2	156	12	3
February	136,245	4.3 (39.74)	13.5	104.4	7.8	4	165	3	11
March	121,100	8.4 (47.12)	13.9	113.0	8.1	3	166	6	33
April	132,000	7.6 (45.68)	13.7	116.2	7.9	3	167	8	5
May	156,758	10.5 (50.9)	13.1	118.5	8.0	4	156	44	13
June	160,567	14.3 (57.74)	11.8	116.7	8.0	5	130	80	10
July	141,327	17.6 (63.68)	11.2	118.7	8.0	3	135	124	12
August	113,200	19.1 (66.38)	10.2	111.4	8.0	3	140	86	10
September	106,745	19.2 (66.56)	10.1	110.3	8.2	2	141	61	5
October	100,979	16.6 (61.88)	10.4	108.1	8.1	2	147	17	4
November	103,443	11.8 (53.24)	10.7	99.8	7.9	2	146	33	6
December	122,269	6.8 (44.24)	11.4	94.5	7.7	2	161	22	6
# Months Sampled		147	147	147	147	142	147	145	142
Mean		11.6 (52.88)	11.9	108.8	8.0	2.9	151	40	10
Maximum		36.0 (96.8)	16.3	145.8	9.2	11	202	700	300
Minimum		0.8 (33.44)	7.9	76.5	6.7	1	96	0	1
St. Dev.		6.1	1.7	12.6	0.4	2	20	107	28

Source: Chelan PUD 1999
[1]umho/cm: micromhos
[2]MFM-FCBR: membrane filter method/fecal coliform broth
Note: Flow is computed as mean of daily values at which samples were collected.

Table 5.2-11 Average Values for Water Quality Monthly Grab Samples at Ecology Monitoring Station Below Rock Island Dam (1977 to 1990) (2 of 2)

MONTH	MEAN FLOW (CFS)	NH_3+NH_4 N TOTAL (MG/L)	UNIONIZED AMMONIA (MG/L)	NO_2+NO_3 N TOTAL (MG/L)	TOTAL PHOSPHORUS (MG/L)	DISSOLVED ORTHO P (MG/L)
January	135,425	0.02	0.0001	0.146	0.033	0.015
February	136,245	0.02	0.0001	0.130	0.035	0.018
March	121,100	0.03	0.0003	0.188	0.038	0.009
April	132,000	0.03	0.0001	0.135	0.035	0.017
May	156,758	0.05	0.0001	0.118	0.038	0.010
June	160,567	0.03	0.0002	0.057	0.042	0.013
July	141,327	0.04	0.0003	0.065	0.029	0.015
August	113,200	0.02	0.0010	0.082	0.025	0.017
September	106,745	0.03		0.228	0.036	0.017
October	100,979	0.03	0.0006	0.137	0.030	0.015
November	103,443	0.02	0.0003	0.135	0.035	0.013
December	122,269	0.02	0.0002	0.183	0.046	0.015
# Months Sampled		140	13	64	136	139
Mean		0.03	0.0003	0.129	0.035	0.014
Maximum		0.26	0.0010	0.420	0.140	0.060
Minimum		0.00	0.0001	0.010	0.010	0.000
St. Dev.		0.03	0.0003	0.083	0.020	0.009

Source: Chelan PUD 1999
Note: Flow is computed as mean of daily values at which samples were collected.

Nutrients[26]

Generally, the Mid-Columbia River is a low nutrient system due to the large volume of water flow and regional geology (FERC 2006). Nutrient data near the Rock Island Project are available from Ecology's Statewide River and Stream Ambient Monitoring at the Columbia River below Rock Island (1977 to 1990; Table 5.2-11) and the Columbia River at Odabashian (Highway 2) Bridge[27] (2005 to 2006; Table 5.2-12) as well as from monitoring conducted by Chelan PUD in 2022 and 2023 (see Appendix G.1) (Four Peaks 2023b).

The range of total ammonium nitrogen (NH_3 and NH_4+) reported by Ecology at the Rock Island monitoring station during historic monitoring (1977 to 1990) was 0 to 0.26 mg/L; average total nitrogen was 0.03 mg/L (Table 5.2-11) (Chelan PUD 1999). The unionized ammonia concentrations, which are more relevant for aquatic life toxicity, remained below 0.001 mg/L. For the range of pH and temperatures reported in August (when the highest unionized ammonia concentrations were reported), the acute and chronic criteria, calculated based on WAC 173-201A-240, ranged from 3.825 – 8.107 mg/L (when salmonids are present), and 0.038 to 0.042 mg/L, respectively. The observations in Table 5.2-11 were much lower than these criteria suggesting no risk of ammonia toxicity within the Rock Island Project. Sampling in 2022-2023 by Chelan PUD also documented low ammonia levels (see Appendix G.1) (Four Peaks 2023b). Ammonium (NH_4) levels were frequently below the detection limit; the practical quantitation limit for NH_4 was 0.02 mg/L.

Nitrate-plus nitrite-nitrogen (NO_3 + NO_2-N) were highest in the winter months and at seasonal lows in July and August in 1977 to 1990 and 2005-2006. The average nitrite and nitrate level downstream of Rock Island was 0.129 mg/L (Table 5.2-11) (Chelan PUD 1999). The Rock Island Reservoir would be classified as oligotrophic (low productivity) based on total dissolved inorganic nitrogen (ammonium + nitrite + nitrate) the form which is readily available for uptake by phytoplankton (Nürnberg 1996). More recent monitoring in the Rock Island Reservoir documented total persulfate nitrogen ranging from 0.10 to 0.35 mg/L during monthly samples in the 2006 water year (Table 5.2-12) (Ecology 2021c). Total persulfate nitrogen includes both inorganic and organic nitrogen. The latter is not readily bioavailable. Sampling in 2022-2023 by Chelan PUD also documented generally low nitrogen levels and were largely comparable with the levels observed in the previous studies (see Appendix G.1) (Four Peaks 2023b).

[26] Values are expressed in mg/L.
[27] The formal name given to the monitoring station below Rock Island by Ecology is "Columbia River at Highway 2 Bridge;" however, the location of this bridge is known locally as Odabashian Bridge, and as such, the name of this station has been modified in this document.

Phosphorous is an important nutrient for algal and aquatic plant growth and often limits primary productivity in rivers and lakes (Baird and Bridgewater 2017). Total phosphorus levels downstream of Rock Island Dam ranged from 0.010 to 0.140 mg/L during 1977 to 1990; the average concentration was 0.035 mg/L (Table 5.2-11) (Chelan PUD 1999). More recent sampling in the Rock Island Reservoir at the Highway 2 bridge just upstream of Wenatchee in water year 2006 reported total phosphorus levels ranging from 0.0045 to 0.0077 mg/l (Table 5.2-12) (Ecology 2021c). In the historic sampling downstream of Rock Island Dam, dissolved orthophosphate ranged from 0 to 0.060 mg/l with an average of 0.014 mg/l. In the more recent sampling, orthophosphate was below the detection limit of 0.003 mg/l in five of the monthly samples with a peak concentration of 0.0053 mg/l in December (Table 5.2-12). Sampling in 2022-2023 documented total phosphorus concentrations that varied among sites and sampling events but generally remained below 10 ug/L. Rock Island Project waters are oligotrophic based on observed total phosphorus levels (Nürnberg 1996).

Turbidity[28]

The Columbia River has relatively low turbidity because of the low incoming sediment loads from the reservoirs upstream (Section 5.1.4). In addition, the high flows, relatively narrow range of operating pool elevations and substrate of the Columbia River within the Rock Island Project generates very low sediment loads (Chelan PUD 1999). Monthly sampling data from the Ecology monitoring station below Rock Island Dam (1977 to 1990) reported a range of 1.0 nephelometric turbidity unit (NTU) to 11.0 NTUs with a mean value of 2.9 NTUs (Table 5.2-10) (Chelan PUD 1999). More recent monitoring in the Rock Island Reservoir documented similarly low turbidity levels in 2006; with an average of 1.1 NTUs (Table 5.2-12) (Ecology 2021c). Sampling in the Rock Island Reservoir in 2022-2023 documented turbidity levels largely less than 1 NTU. Based on the 2022-2023 data turbidity meets the numeric criteria of no more than 5 NTUs over background, regardless of what the background turbidity is.

pH[29]

The pH at Ecology's monitoring station below Rock Island Dam ranged from 6.7 to 9.2 over the 147 monthly readings taken between October 1977 and January 1990 with an average value of 8.0, on the basic side of neutral (Table 5.2-10) (Chelan PUD 1999). More recent data collected in Rock Island Reservoir in 2005-2006 documented similar pH levels, with a mean of 7.96 and values ranging between 7.7 and 8.27 during 11 monthly samples (Table 5.2-12) (Ecology 2021c). During

[28] Turbidity is measured in "nephelometric turbidity units" (NTUs).
[29] Measurement of pH is expressed as the negative logarithm of the hydrogen ion concentration.

sampling in 2022-2023, pH was similar among the mainstem locations and was consistently within the 6.5 to 8.5 numeric criteria.

Conductivity[30]

Conductivity is a measure of the concentration of ionic substances, which can be affected by geology, atmospheric deposition, water temperature, and the presence of dissolved inorganic solids or organic compounds from urban or agricultural runoff (USEPA 2012a). Conductivity below Rock Island Dam averaged 151 micromhos per centimeter (umho/cm) for 1977 to 1990 (Table 5.2-10) (Chelan PUD 1999). Monitoring in the Rock Island Reservoir in 2005 to 2006 documented conductivity levels between 118 umho/cm and 151 umho/cm, averaging 135 umho/cm (Table 5.2-12) (Ecology 2021c). Monitoring on September 8, 2007, measured specific conductivity levels between approximately 122 µs/cm and 132 µs/cm with the lower values upstream and the higher values observed closer to Rock Island Dam (CCC, WVFF, and CR 2007). Conductivity in this reach of the Columbia River was higher in winter months. The large water volume associated with spring runoff for the Columbia River tends to dilute ion concentrations (USEPA 2012a).

[30] Conductivity is expressed in micromhos (umho/cm).

Table 5.2-12 Water Quality Monthly Grab Samples at Ecology Monitoring Station Columbia River at Odabashian (Highway 2) Bridge, 2005 to 2006

SAMPLE DATE	WATER TEMPERATURE (°C/°F)	DISSOLVED OXYGEN (MG/L)	DISSOLVED OXYGEN (PERCENT SATURATION)	TOTAL PERSULFATE NITROGEN (MG/L)	NITRITE-NITRATE (MG/L)	PHOSPHORUS (MG/L)	ORTHOPHOSPHATE (MG/L)	TOTAL SUSPENDED SOLIDS (MG/L)	TURBIDITY (NTU)	PH	SPECIFIC CONDUCTIVITY (UMHOS/CM AT 25°C)	FECAL COLIFORM (PER 100ML)
10/3/2005	17.6 (63.68)	9.17	97.8	0.13	0.065	0.0058	0.003	1	0.5	7.94	136	4
11/7/2005	13.3 (55.94)	9.59	93.5	0.13	0.086	0.0064	0.0049	1	0.5	7.9	133	4
12/5/2005	9.1 (48.38)	10.4	90.6	0.16	0.114	0.0068	0.0053	2	0.6	7.88	136	3
1/11/2006	5.1 (41.18)	12.16	98	0.349	0.117	0.0064	0.004	2	0.9	8.13	145	1
2/6/2006	3.8 (38.84)	12.75	97.2	0.22	0.186	0.0045	0.003	2	1.1	8.04	144	1
3/6/2006	3.7 (38.66)	12.98	100.7	0.283	0.234	0.0077	0.0045	2	1.8	7.99	144	1
4/10/2006	4.9 (40.82)	13.71	109.8	0.21	0.131	0.0046	0.003	2	0.9	8.27	151	1
5/8/2006*	9.4 (48.92)	12.78	-	-	-	-	-	-	-	-	-	1
6/6/2006	13 (55.4)	11.95	115.4	0.12	0.054	0.0065	0.0042	5	3.3	7.85	118	2
7/17/2006	17.4 (63.32)	10.51	111.4	0.12	0.045	0.0056	0.003	2	0.7	7.77	122	1
8/14/2006	19.3 (66.74)	9.48	105.1	0.12	0.053	0.0052	0.0038	1	0.7	7.86	127	1
9/11/2006	19.6 (67.28)	9.07	100.3	0.10	0.057	0.0048	0.003	1	0.7	7.98	130	2
Average	11.35 (52.43)	11.21	101.8	0.177	0.104	0.0058	0.0038	1.9	1.1	7.96	135	1.8

Source: Ecology 2021c
*There are no data reported for total suspended solids, turbidity, pH, and specific conductivity on May 8, 2006.

Bacterial Contamination[31]

Bacterial contamination is typically assessed through concentrations of coliform bacteria, which are present in the intestinal tracts and feces of warm-blooded animals (USEPA 2012b). The concentration of fecal coliform bacteria has been used as an indicator of a waterbody's suitability to support primary contact recreation, which is a designated use for the Columbia River within the Rock Island Project Boundary. The historic average of 40 colony forming units (CFU) per 100 milliliters (CFU/100 ml) sample taken at Rock Island Dam station on the Columbia River was within the historic water quality standard of geometric mean of 100 CFU per 100 ml (Table 5.2-10) (Chelan PUD 1999; WAC 173-201A-200(2)(b)). Less than 10 percent of the samples (6.2 percent) exceeded 200 CFU per 100 ml sample, which was within an acceptable range as per the standards (Table 5.2-6). The 2005 to 2006 sampling in Rock Island Reservoir documented low concentrations ranging between 1 and 4 CFU per 100 ml sample (Table 5.2-12) (Ecology 2021c). The use of fecal coliform organism levels to determine compliance with the primary contact recreation bacteria criteria expired December 31, 2020 (WAC 173-201A-200(2)(b)). The current criteria are based on *Escherichia coli* (*E. coli*; see Table 5.2-6). *E. coli* data are not available in the historical datasets summarized herein, but these data were collected as part of the water quality monitoring study conducted by Chelan PUD in 2022 and 2023 (see Appendix G.1) (Four Peaks 2023b). *E. coli* concentrations were low across the study period in the Columbia River, with a maximum of 20 CFU/100 mL observed in the Rock Island forebay in August 2023.

Toxic Contaminants

The primary sources of information about toxic contaminants in the Rock Island Project Boundary are State fish consumption advisories, the CWA 303(d) List of Impaired Waters (Table 5.2-7), and the TMDL that is presently in effect to address some of these impairments (USEPA 1991). The Mid-Columbia River and its tributaries have several fish consumption advisories issued by the Washington State Department of Health that recommend limiting the number of specific types of fish consumed. Advisories in the Rock Island Project are for PCBs and mercury in the Wenatchee River and for mercury in the Columbia River due to the statewide advisory (Washington State Department of Health 2021).

Seiders et al. (2015) analyzed skin-on fillet samples from 54 fish collected from six sites within the upper portion of the Mid-Columbia, from Wanapum Dam near Vantage upstream to Grand Coulee Dam. Herger et al. (2017) sampled fish tissues from the Columbia River near Rock Island Dam as part of a Mid-Columbia reach-wide study of toxic contaminants. Both studies reported relatively high concentrations of 4,4' DDE at the sites downstream of the confluence of the Okanogan and

[31] Bacteria criteria are expressed as colony forming units (CFU) or most probable number (MPN).

Columbia rivers, including Rock Island Reservoir. Although DDTs and the other persistent chlorinated pesticides are likely related to historical agricultural applications, improved land management practices have significantly reduced concentrations of DDT in fish tissue in some portions of the Columbia Basin (Ecology 2014). Within the Wenatchee River watershed, Mission Creek has an active Total DDT TMDL which addresses one of the pesticide sources to the Rock Island Project (Ecology 2007).

In a study of sediments near the Alcoa aluminum plant in Wenatchee, Damkaer and Dey (1986) reported elevated concentrations of polycyclic aromatic hydrocarbons in both sediments near the water discharge point and sediments from the forebay and tailrace of the Rock Island Project. However, Damkaer and Dey (1986) also noted that the relatively high-water velocities limited the accumulation of contaminated sediments within the Columbia River downstream of the outfall in the Wenatchee area. The Alcoa aluminum plant near Wenatchee is no longer operational, although it still holds an active NPDES discharge permit.

Ecology studied the sources of PCBs that contributed to elevated fish tissue concentrations in the Wenatchee River (Hobbs 2018). Based on water, biofilms, invertebrates and fish tissue PCB data, and an analysis of PCB congener profiles from different areas, the study identified two possible areas of PCB exposure within the Wenatchee River for native Mountain Whitefish (*Prosopium williamsoni*). The upstream area near the city of Cashmere is dominated by Aroclor 1254 signature, while the downstream area near the confluence with the Columbia River was identified to predominantly contain Aroclor 1248 mixture. The source of upstream exposure was identified as a former landfill near the city of Cashmere. The study could not ascertain a definitive source for the downstream area near the confluence but pointed to the sediments in the backwater channels at the mouth of the Wenatchee River as a possible source of PCBs.

5.2.6 References

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5.3 Fish and Aquatic Resources

As specified in 18 CFR § 5.6(d)(3)(iv) and (vii), this section summarizes available information on existing fish and aquatic communities, aquatic habitat, and the temporal and spatial distribution of RTE fish and macroinvertebrate species in the vicinity of the Rock Island Project. Detailed information on the Rock Island Project is based on current understanding of existing environmental resources in the Rock Island Project area.

5.3.1 Aquatic Habitat

This section summarizes available information on aquatic habitats within the area of the Rock Island Project.

5.3.1.1 Mainstem Columbia River

A description of the Columbia River hydrograph and water quality in the Rock Island Project is provided in Section 5.2 of this document. The shoreline relief, together with relatively small littoral area for an impoundment of this size and the hydraulic characteristics of the Rock Island run-of-river hydropower dam, contribute to a rapid turnover rate of the reservoir. Temperature monitoring in the Rock Island forebay documented a lack of thermal stratification in the summer (see Appendix G.1) (Four Peaks 2023a). Monitoring conducted by Chelan PUD in 2022 and 2023 indicated low chlorophyll *a* levels in the water column. In addition, these data also showed low nutrient levels, and indicated that the mainstem Columbia River within the Rock Island Project can be considered oligotrophic (Appendix G.1) (Four Peaks 2023a). The largest source of primary productivity in the reservoir comes from detritus, sessile algae, and macrophytes (NMFS 2002). This supports a relatively diverse zooplankton assemblage comprising cladocerans, copepods and rotifers as observed during monitoring in 2022 and 2023 (see Appendix G.1) (Four Peaks 2023a). *Bosmina longirostris* and *Kellicottia longispina* were the dominant taxa in the summer, whereas Cyclopoid and Calanoid copepodites were the dominant taxa in the fall. These findings of generally oligotrophic conditions and low productivity are consistent with the previous studies of the lower trophic level productivity in the Mid-Columbia River (for example, EES 2006).

The varied topography of the Rock Island Project area also contributes to diversity in the aquatic habitats that are available to aquatic vegetation, invertebrates, and fish. The Rock Island Project area provides spawning, rearing, foraging, and migratory habitat for a diverse assemblage of native and introduced aquatic species. The habitat requirements, life history, and status of fish species in the Rock Island Project area are described in the section below.

5.3.1.2 Wenatchee River Subbasin

A description of the Columbia River Basin and its subbasins is outlined in Section 3.1.

Like the portion of the Columbia River that lies in the Rock Island Project Boundary, the mouth of the Wenatchee River provides habitat for a wide range of aquatic species. This document summarizes the aquatic resources in the Rock Island Project area, including a discussion of the resources at the confluence of the Wenatchee River.

5.3.2 Large Wood

Large wood has varied influences on river ecosystems including channel formation and maintenance, storage of organic matter and sediment, modification of transport and storage of nutrients, and creation of habitat for different life stages of fish species (Bilby and Bisson 1998). Wood recruitment into streams include direct tree fall, mass wasting of forested hillslopes, and forest death associated with wildfire, floods, ice, or insect damage (Hough-Snee et al. 2015). In the Mid-Columbia River, most wood recruitment is due to transport from tributary watersheds such as the Entiat, Wenatchee, Methow, and others (Hough-Snee et al. 2015).

While large wood has ecological importance to aquatic systems, it is also a hazard to hydropower operations. Chelan PUD removes large wood that accumulates on the surface of the forebay of Rock Island Dam to prevent clogging of trash racks and potential damage to turbines. Large wood is stored temporarily and then chipped into recyclable mulch. The volume and frequency of large wood removal depends on annual runoff timing as well as the intensity of forest fires in the basin during the prior year. Large wood in the forebay ranges from less than an acre of coverage in light years to over 6 acres in heavy years (B. Odell, Chelan PUD, personal communication, July 13, 2022).

5.3.3 Submerged Aquatic Vegetation (Macrophytes)

Submerged aquatic vegetation can be an integral component of an aquatic ecosystem, providing structure within littoral habitats as well as shelter, nesting, and forage opportunities for various aquatic species. These plant communities can affect light, temperature, turbulence, sediment, water chemistry, production of other aquatic species, and habitat complexity (Johnson and Ostrofsky 2004).

Native aquatic plant communities support the life functions of a diversity of organisms from various trophic levels. In the Columbia River, aquatic plants provide increased habitat complexity and quality for rearing juvenile fish. Aquatic plants can be a source of food for some aquatic species and can increase aquatic productivity and nutrient cycling (Lê and Kreiter 2006). Beds of aquatic vegetation generally occur in shallow, nearshore environments at depths with light penetration

and appropriate substrate (Lê and Kreiter 2006) and can be a factor in determining the quality of aquatic habitat for fishes (WDFW 2013a). Specific information on existing macrophytes at the Rock Island Project (EAS 2023a) is provided in Section 5.5.3 and Appendix G.2.

5.3.4 Macroinvertebrates

A macroinvertebrate survey was completed in 1999 between the tailraces of the Wells and Rocky Reach dams. The study provides a baseline inventory of species that may occur in the Rock Island Project Boundary. Seventy-two different taxonomic groups were encountered during this 1999 benthic macroinvertebrate survey (Chelan PUD 2000). The macroinvertebrate community was dominated by Chironomidae (midges), Trichoptera (caddisflies), Isopoda (sow bugs), Bilvalvia (clams and mussels), Gastropoda (snails), Amphipoda (scuds), Acari (water mites) and Oligochaeta (bristle worms). None of the species of bivalves and gastropods documented in this survey were listed as Washington State Priority or Candidate Species (Chelan PUD 2000). A similar benthic macroinvertebrate study completed upstream at the Wells Project in 2006 documented 88 different taxonomic groups in the Wells Reservoir and lower Methow and Okanogan rivers (BioAnalysts 2006).

Further information on presence of taxa is provided in the annual aquatic invasive species (AIS)[32] monitoring reports for Rocky Reach (Chelan PUD 2020), a benthic macroinvertebrate study survey conducted during the emergency drawdown of the Wanapum pool in 2014 (Tiller 2015), and during White Sturgeon (*Ascipenser transmontanus*) diet analysis studies on Rocky Reach Reservoir (Robichaud et al. 2017). Three mollusk species listed as Washington State Candidate or Federal species of concern were thought to potentially occur during those surveys, including the giant Columbia River limpet (*Fisherola nutalli*), the giant Columbia spire snail (*Fluminicola columbiana*), and the California floater (*Anodonta californiensis*). However, none of these species were encountered during the studies, nor the subsequent 2020 Chelan PUD macrophyte surveys (Chelan PUD 2020).

In 2022, eDNA samples were collected in the Rock Island Reservoir and indicated the likely presence of four mussel species including the western pearlshell (*Margaritifera falcata*), the western ridged (*Gonidea angulata*),[33] the Oregon floater (*Anodonta oregonensis*), and the California floater (EAS 2023b). Except for the Oregon floater, all other mussels are listed as Species of Greatest Conservation Need (SGCN) under the State Wildlife Action Plan (SWAP). In addition, the California floater remains a Washington state candidate species and is a Priority Species under

[32] The term "AIS" includes invasive species of plants, macroinvertebrates and fish.
[33] In 2020, the species was petitioned for listing under the ESA.

WDFW's Priority Habitats and Species Program (PHS). The 2022 eDNA survey also indicated the presence of an invasive species, the New Zealand mudsnail (*Potamopyrgus antipodarum*) at one location approximately 16 RMs upstream from the Rock Island Dam (EAS 2023b).

5.3.5 Rare, Threatened, Endangered, and Priority Fish Species

There are approximately 40 species of fish potentially present in the Rock Island Project area, based on monitoring reports from Rock Island smolt monitoring studies (Chelan PUD 1996), resident fish studies at Rocky Reach Reservoir (WDFW 2013a) and Priest Rapids Reservoir (WDFW 2018). Fish assemblage is expected to be a diverse group of native and non-native stocks. Of the known species present in this area, there are three fish species that are federally listed under the ESA and one species of concern. There are no state listed species.

5.3.5.1 Federal RTE Fish Species

The Upper Columbia River Bull Trout (*Salvelinus confluentus*) is listed as a threatened species and included in the USFWS Information for Planning and Consultation (IPaC) report (USFWS 2023a) (Table 5.3-1). The Upper Columbia River steelhead was listed as an endangered species in 1997, and then downlisted as a threatened species in 2006. The Upper Columbia River spring Chinook Salmon was listed as an endangered species in 1999 and the listing was revised but the endangered status retained in 2005 (NMFS 2016a).

Pacific Lamprey (*Entosphenus tridentatus*) occur in the Rock Island Project Boundary and are designated as a USFWS Species of Concern (Table 5.3-1) but are not listed under the ESA.

5.3.5.2 State RTE Fish Species

Both the Upper Columbia River Bull Trout (WDFW 2023a), and the Leopard Dace (*Rhinichthys falcatus*) are Washington State candidate species (Table 5.3-1) (WDFW 2021a). White Sturgeon, Pacific Lamprey, and Westslope Cutthroat Trout (*Oncorhynchus clarkii lewisi*) are listed as SGCN (WDFW 2015). They are also identified as PHS (WDFW 2021b).

Details on the life history, habitat requirements, distribution and applicable management plans of these fish species are discussed in the following sections: anadromous fish (Section 5.3.6) and resident fish (Section 5.3.7).

Table 5.3-1 Federal and State RTE Fish Species

SCIENTIFIC NAME	COMMON NAME	STATUS[1]
Ascipenser transmontanus	White Sturgeon	PHS; SGCN
Entosphenus tridentatus	Pacific Lamprey	SoC; PHS; SGCN
Oncorhynchus clarkii lewisi	Westslope Cutthroat Trout	PHS; SGCN
Oncorhynchus kisutch	Coho Salmon	PHS
Oncorhynchus mykiss	Rainbow Trout	PHS
Oncorhynchus mykiss	Upper Columbia River Summer Steelhead	FT; PHS
Oncorhynchus nerka	Kokanee	PHS
Oncorhynchus nerka	Sockeye Salmon	PHS
Oncorhynchus tshawytscha	Summer Chinook	PHS
Oncorhynchus tshawytscha	Upper Columbia River Spring Chinook Salmon	FE; PHS
Rhinichthys falcatus	Leopard Dace	SC
Salvelinus confluentus	Upper Columbia River Bull Trout	FT; PHS; SC
Salvelinus malma	Dolly Varden/Bull Trout	PHS

Source: WDFW 2015, 2021a, 2021b and 2023a

[1]FE=Federally Endangered; FT=Federally Threatened; PHS=Priority Habitat and Species Program; SC= State Candidate; SoC= USFWS Species of Concern; SGCN= Species of Greatest Conservation Need

5.3.6 Anadromous Fish

Anadromous fish at the Rock Island Project include salmon, steelhead, and Pacific Lamprey. The discussions on salmon and steelhead below focus on Upper Columbia River (UCR) species. Chelan PUD has recently identified that a small number of adult Snake River and other out of basin salmon and steelhead overshoot their natal streams and stray into the Rock Island Project area. To the extent that these fish interact with the Rock Island Project, the impacts to such fish are expected to be similar to the UCR species.

5.3.6.1 Chinook Salmon

As discussed in Section 4.3, Chinook Salmon are a Plan Species. They are a widely distributed, anadromous, and semelparous species in the genus *Oncorhynchus*. The species range is circumpolar from California to Asia (Groot and Margolis 1991). There are two types of Chinook Salmon in the UCR: spring-run and summer/fall-run (Quinn 2005). Spring Chinook Salmon return to the Columbia River in the spring and typically spawn between August and early September. Summer/fall Chinook Salmon return to the Columbia River in the summer and fall and typically spawn between September and November.

5.3.6.2 Upper Columbia River Spring Chinook Salmon

The UCR spring Chinook Salmon evolutionarily significant unit (ESU) includes naturally reproducing populations and hatchery programs upstream of Rock Island Dam and downstream of Chief Joseph

Dam (NMFS 2022). The ESU is composed of three populations: the Methow, Entiat, and Wenatchee. NMFS has defined this ESU to include artificially propagated spring-run Chinook Salmon from the Methow Composite Program, Twisp River Program, Winthrop National Fish Hatchery (NFH) Program, Chiwawa River Program, and the Nason Creek Program. Chinook Salmon from the Chief Joseph Hatchery Spring Chinook Program released into the Okanogan River are not included in the ESU. The Okanogan population is considered extinct but the CTCR is implementing an Okanogan Chinook Salmon reintroduction program that has been designated as an experimental population under Section 10(j) of the ESA (NMFS 2022).

Life History

Spring Chinook Salmon in the UCR ESU are "stream-type" fish, with juveniles initiating their seaward migration after their first year in freshwater (Groot and Margolis 1991). Female returning spawners are typically 3 to 5 years old, and males spawners are typically 2 to 5 years old. Males that return to spawn after one sea-winter are commonly referred to as jacks. Some males (precocious parr and minijacks) do not migrate to the ocean and instead mature in their second year of life; these life-history variants are more prevalent in hatchery-origin fish (Harstad et al. 2014).

Adult spring Chinook Salmon generally return to the Columbia River from the ocean in April and enter Columbia River tributaries between May and August. Homing to their natal stream is accomplished through olfactory imprinting (Quinn 2005). Migrating adults hold in tributary pools with cold water through the summer before spawning. Spawning occurs in the upper reaches of tributaries between August and early September; females site redds in riffles and pool tailouts with gravel to cobble substrate (PFMC 2014). Redds may be susceptible to dewatering, if the water becomes too low, or to scour, if the water becomes too high and fast in spawning areas (Montgomery et al. 1996; DeVries 1997). Because spawning coincides with peak annual water temperatures, spring Chinook must spawn in reaches that provide cold water, often located in the tributary headwaters. Eggs incubate in the stream substrate from approximately August to March.

Following emergence in March and April, young fry tend to distribute downstream and occupy stream margins where water is slower, shallower, and features finer substrate. However, spring Chinook Salmon fry can be found in virtually every habitat in small numbers (Groot and Margolis 1991). As fry transition to the parr stage, they shift to deeper water, inhabiting primarily pools and stream margins, undercut banks, and areas near woody debris accumulations (PFMC 2014; Groot and Margolis 1991). From late summer through early winter, a proportion of parr migrate downstream from the upper reaches of tributary systems to overwinter in lower river reaches (Quinn 2005). The remaining portion of the population overwinters in tributary headwater reaches. Parr begin the physiological transformation to the smolt stage in the late winter and early spring at 1 year old.

Spring Chinook Salmon smolts begin their downstream migration from tributary rearing habitats in early spring. The timing of the smolt migration is related to lengthening photoperiod, increasing water temperature, and increasing stream flows (Quinn 2005). The migratory corridor consists of the mainstems of subbasin tributaries and the Columbia River. Smolts are silver with counter-shaded coloration in preparation for life in open water. Upon entering the Columbia River estuary, smolts complete the physiological transition to salt water and can grow rapidly due to abundant estuarine food resources (Simenstad et al. 1982). Relative to summer/fall Chinook Salmon, however, spring Chinook Salmon smolts move quickly through the estuary and into offshore waters (McMichael et al. 2013).

Columbia River spring Chinook Salmon tend to move north in the ocean and are generally found further from the coast than summer/fall Chinook, ranging from Oregon to Alaska. Survival and growth in the ocean are strongly influenced by a complex interaction of sea surface temperatures, upwelling, currents, predators, and food supply (Quinn 2005). Chinook may achieve 99 percent or more of their lifetime growth at sea (Quinn 2018).

Adult Migration through the Rock Island Project

Upstream passage of Chinook Salmon occurs at the Rock Island Adult Fishways between May and August (Figure 5.3-1). The median start date of the adult spring Chinook Salmon run at Rock Island Dam is May 6, and the median passage date of the first 5 percent of the run is May 14. The median (50 percent) passage date is May 29. The median 95 percent passage date is July 4, and the median end date of the run is August 23 (Table 5.3-2) (DART 2023a). Adult spring Chinook Salmon move upstream of the dam and disperse through the UCR to their natal tributaries. Adults occupy the Rock Island Project from May to August. Mean travel time from Rock Island Dam to Rocky Reach Dam is 1.16 days. Most adults bound for the Wenatchee subbasin enter the river by June. Counts at Tumwater Dam, a non-project facility located on the Wenatchee River at RM 27.3, indicate that peak movement upstream in the Wenatchee subbasin occurs in early July, and most of the run has passed Tumwater Dam by early August (Hillman et al. 2022).

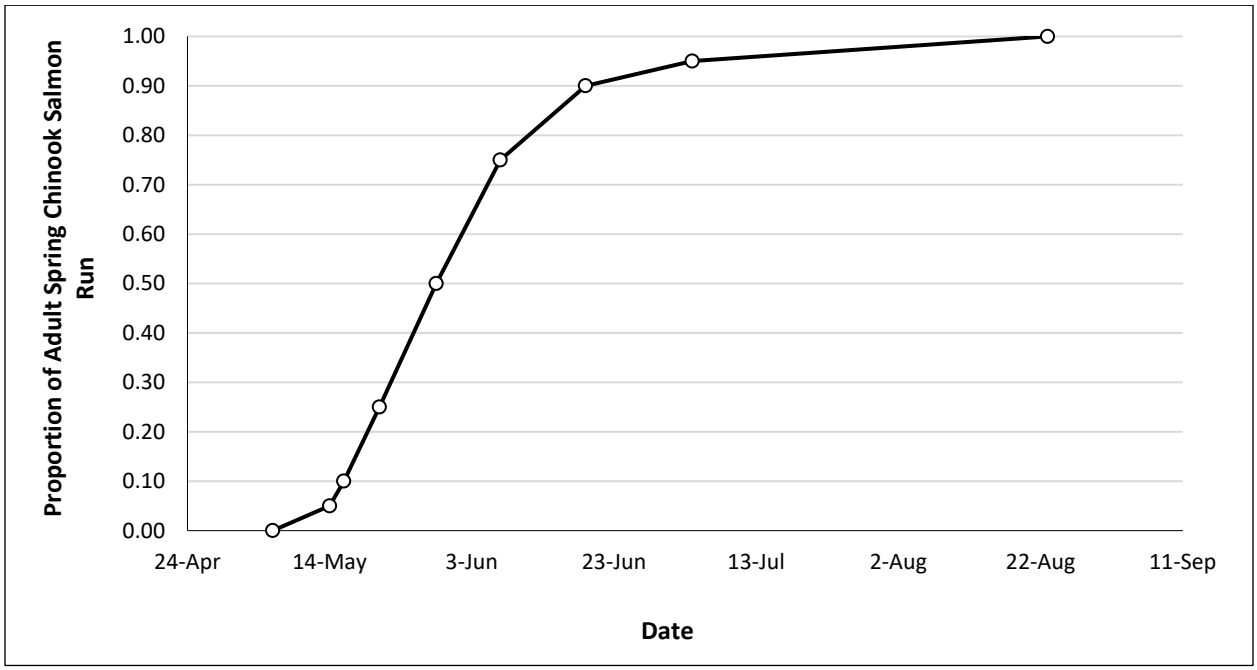


Figure 5.3-1 Cumulative Seasonal Run Timing for Spring Chinook Salmon at Rock Island Adult Fishways During the Period of 1998 to 2022

Table 5.3-2 Spring Chinook Salmon Use of the Rock Island Project

LIFE HISTORY STAGE	TIMING	HABITAT USE	DESCRIPTION
Adult	May to August	Migration Corridor and Holding	Returning adults use the Columbia River as a migration corridor. Adults may hold in the Columbia temporarily before ascending natal subbasins rivers.
Incubation	NA	None	Spawning and incubation take place in subbasins.
Juvenile	October to June	Overwinter	Juveniles (~50%) from the Entiat exit tributaries to overwinter in mainstem reservoirs.
Smolt	April to August	Migration Corridor	Smolts use the Columbia River as a migration corridor.

Sources: DART 2023a and 2023b; Hillman et al 2022

Adult Conversion Rate

Among spring Chinook Salmon known to originate from tributaries upstream of the Rock Island Project, the conversion rate of migrating adults between Rock Island Dam and Rocky Reach Dam is 99.2 percent based on available Passive Integrated Transponder (PIT) tag data from 2006-2022 (DART 2023b).

Smolt Migration through the Rock Island Project

Yearling spring Chinook Salmon smolts are primarily captured at the lower Wenatchee rotary screw trap in April (Hillman et al. 2022). The median date of arrival at Rock Island Dam is between May 1 and May 16. The run is essentially complete in June; the median date for passage through the Rock Island Project for 95 percent of the smolts is June 2 (DART 2023a). The median date of the last fish at Rock Island Dam is August 3 (Figure 5.3-2). The habitat in the Rock Island Project is considered a migratory corridor for juvenile spring Chinook (Table 5.3-2) (NMFS 2005a).

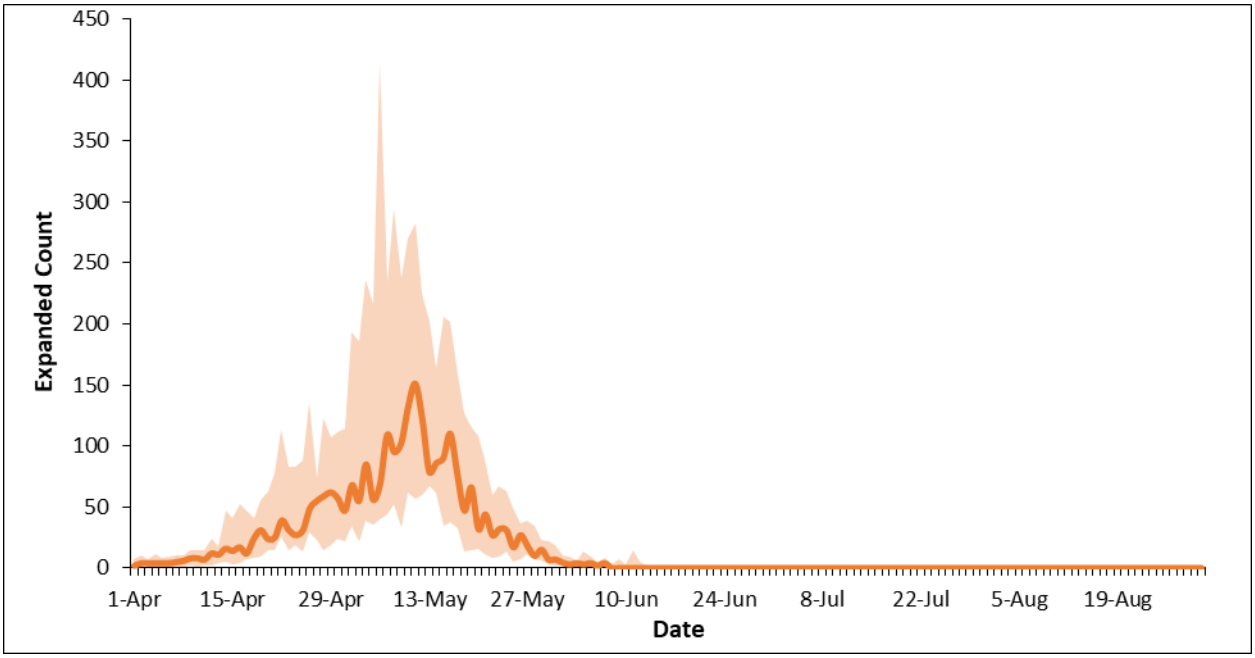


Figure 5.3-2 Rock Island Juvenile Bypass Age-1 Spring Chinook Salmon (Unmarked) Expanded Counts, Median with 95% Confidence Intervals, 2010-2022

Age-0 (subyearling) spring Chinook from the Entiat River have been found to use the mainstem Columbia River as overwinter habitat. Desgroseillier and Glassen (2018) reported capturing age-0 spring Chinook in the Entiat River 6.8 miles upstream of the Columbia River in October and November. The Independent Scientific Advisory Board (ISAB) reported that approximately 50 percent of spring Chinook subyearlings from the Entiat migrated downstream and overwintered in mainstem reservoirs. The Entiat is a smaller and less complex subbasin than the Wenatchee and Methow subbasins, which may explain why a substantial percentage of spring Chinook emigrate as subyearlings from the Entiat (ISAB 2018). Unlike Entiat fish, however, almost none of the Methow or Wenatchee subyearlings left their natal streams prior to overwintering in downstream reaches in the subbasins (ISAB 2018 after a presentation by Desgroseillier et al. 2017). The extent of use of the Rock Island Project by age-0 spring Chinook is uncertain. In general, with the

exception of the Entiat population, UCR spring Chinook Salmon appear to remain in tributaries until emigration as age-1 smolts through the Columbia River and to the ocean (Table 5.3-2).

Status

Endangered Species Act Consultation Record

As described in Section 5.3.5, UCR spring Chinook Salmon are listed under the ESA as endangered by NMFS (NMFS 2005b). The NMFS has administrative responsibility for the protection, conservation, and recovery of the UCR spring Chinook Salmon ESU. In this capacity, NMFS develops analyses and documentation to support the UCR spring Chinook Salmon ESU listing status and status reviews, leads recovery planning efforts, and evaluates the effects of proposed actions that have a federal nexus using the consultation regulations in Section 7 of the ESA.

In response to the ESA listing of UCR spring Chinook Salmon in 1999 (NMFS 1999), the Upper Columbia River Salmon Recovery Board[34] (UCSRB) initiated a recovery planning process in coordination with NMFS and other local, state, federal, and tribal entities. In 2007, the UCSRB completed the UCR spring Chinook and Steelhead Recovery Plan (Recovery Plan; UCSRB 2007), which was adopted by NMFS in 2007. The Recovery Plan objectives identified in the plan included (UCSRB 2007):

- Increase the abundance and productivity of naturally produced spring Chinook and steelhead within each population in the Upper Columbia ESU to levels that would lead to reclassification of the ESU and distinct population segment (DPS) as threatened under the ESA.
- Increase the current distribution of naturally produced spring Chinook Salmon and steelhead in the Upper Columbia ESU and DPS and conserve genetic and phenotypic diversity.
- Increase the abundance of naturally produced spring Chinook Salmon and steelhead spawners within each population in the Upper Columbia ESU and DPS to levels considered viable.
- Increase the productivity (spawner to spawner ratios and smolts/redds) of naturally produced spring Chinook Salmon and steelhead within each population to levels that result in low risk of extinction.

[34] The UCSRB comprises Chelan, Douglas, and Okanogan counties, the CTCR, and Yakama Nation.

- Restore the distribution of naturally produced spring Chinook Salmon and steelhead to previously occupied areas where practical and allow natural patterns of genetic and phenotypic diversity to be expressed.

NMFS has also conducted ESA Section 7 consultations and provided Section 10 incidental take permits related to the Rock Island Project. Under Section 7, if a Proposed Action is likely to adversely affect listed species, the consultation process requires NMFS to develop a BiOp to determine the likelihood, extent, and allowable level of take associated with the Proposed Action, and to determine whether the action will jeopardize the continued existence of the listed species or destroy or adversely modify its designated critical habitat. With respect to the Rock Island Project and UCR spring Chinook Salmon, previous Section 7 consultations have been conducted to evaluate issuance of the Section 10 permit associated with the Rock Island HCP (Chelan PUD 2002a), incorporation of the HCP into the Rock Island FERC license, and more recently on the implementation of Chelan PUD's HCP hatchery compensation program (Table 5.3-3).

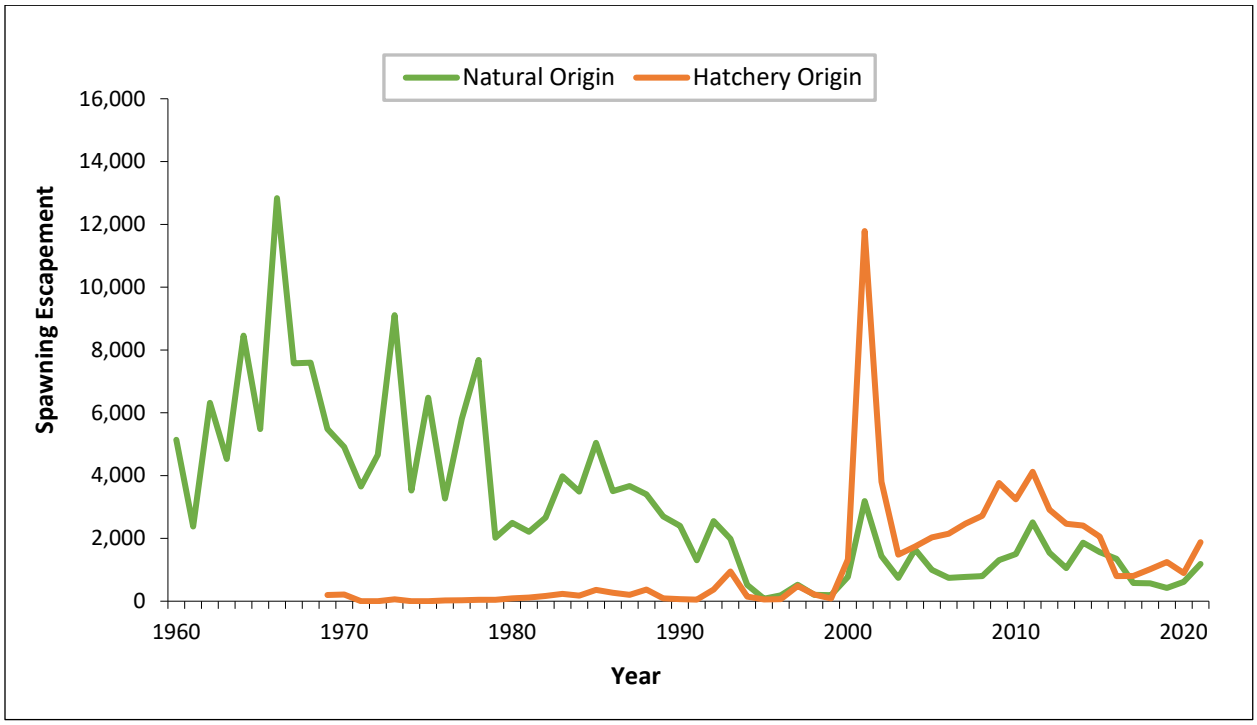
Table 5.3-3 Endangered Species Act Documents Related to Upper Columbia River Spring Chinook Salmon

DOCUMENT	DATE	AUTHOR	DESCRIPTION
Biological Opinion (BiOp) Unlisted Species Analysis, and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Chelan County for the Rock Island Hydroelectric Project (FERC No. 943) Anadromous Fish Agreement and HCP and Construction of a Small Turbine Unit in the Attraction Water Conduit of the Left Bank Adult Fishway. National Oceanic and Atmospheric Administration (NOAA) Fisheries log number: F/NWR/2002/01898	2003a	NMFS	"No jeopardy" BiOp for issuance of 50-year Rock Island Incidental Take Permit No. 1393
Permit for Incidental Take of Endangered/Threatened Species. Permit 1393.	2003b	NMFS	Section 10 ESA permit issued to Chelan PUD
Endangered Species Act – Section 7 Consultation BiOp and Magnuson-Stevens Fishery Conservation and Management Act Consultation on the Federal Energy Regulatory Commission's Approval of the Proposed Anadromous Fish Agreement and Habitat Conservation Plan License Amendment for the Rock Island Hydroelectric Project License (FERC No. 943). NOAA Fisheries Consultation No. F/NWR/2003/05180.	2004	NMFS	"No jeopardy" BiOp for amendment of Project license to incorporate the Rock Island HCP

DOCUMENT	DATE	AUTHOR	DESCRIPTION
ESA Section 7(a)(2) BiOp and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation (Reinitiation 2015): Reinitiation of the Issuance of Three Section 10(a)(1)(A) Permits for the Upper Columbia River Chiwawa River, Nason Creek, and White River Spring Chinook Salmon Hatchery Programs. NOAA Fisheries Consultation Number: NWR-2013-9707 (Permit No. 18121)	2015	NMFS	"No jeopardy" BiOp for issuance of a Section 10 permit for the Chiwawa River, Nason Creek, and White River Spring Chinook Salmon Hatchery programs
ESA Section 7(a)(2) BiOp and Magnuson-Stevens Fishery Conservation and Management Act EFH Consultation: Issuance of Four Section 10(a)(1)(A) Permits for Spring Chinook Salmon Hatchery Programs in the Methow Subbasin. NOAA Fisheries Consultation Number: WCR-2015-3845. (Permit No. 20533)	2016b	NMFS	"No jeopardy" BiOp for issuance of a Section 10 permit for the Methow subbasin spring Chinook hatchery programs

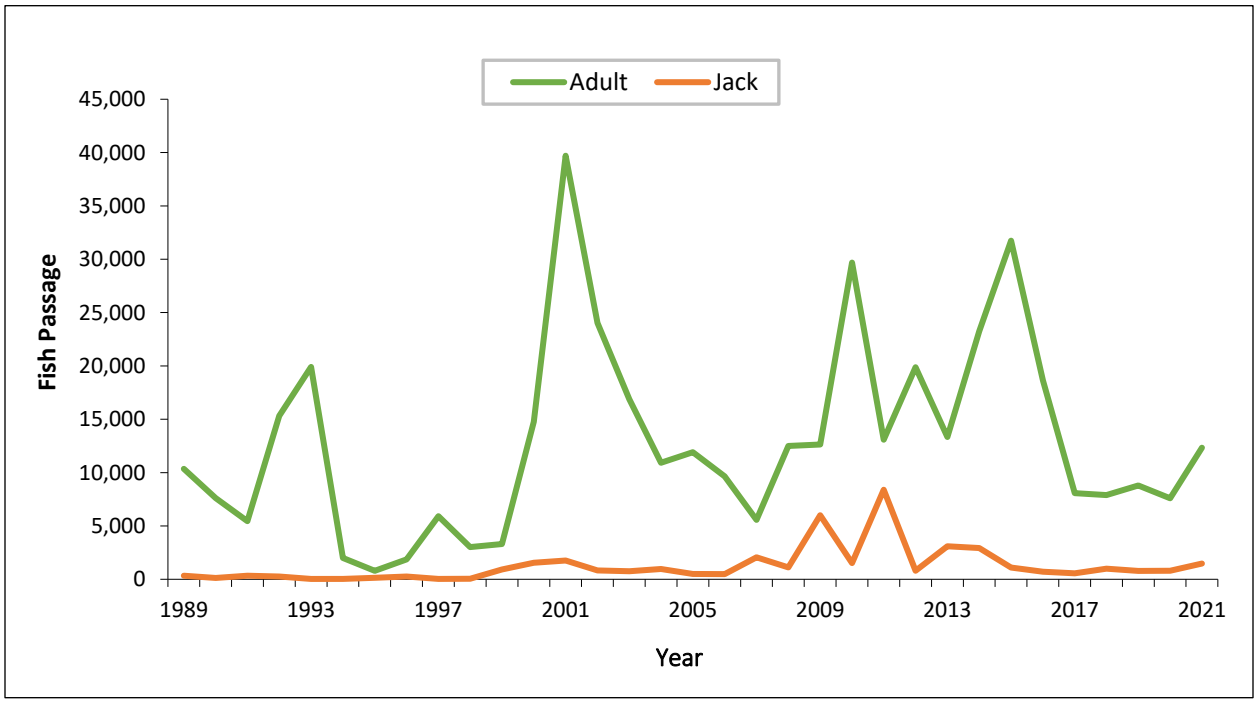
Population Trends

The most recent status review of the UCR spring Chinook Salmon ESU (NMFS 2022) found that the ESU was at a high overall biological risk. This conclusion was based on 5-year abundance levels showing a downward trend with no change in spatial structure or diversity (NMFS 2022). The UCR spring Chinook Salmon ESU natural-origin spawning escapement to the Wenatchee, Entiat, and Methow subbasins declined from a high in 1966 to extremely small runs in the 1990s (Figure 5.3-3). The low abundance of UCR spring Chinook Salmon spawners in the 1990s was also reflected at Rock Island Dam (Figure 5.3-4) where fish counts enumerated UCR spring Chinook Salmon prior to reaching spawning tributaries. The implementation of hatchery programs has generally increased the number of returning adults over the past 2 decades (Figure 5.3-3); however, the number of natural-origin spawners has remained low throughout the ESU (Figure 5.3-3). At the tributary level, hatchery programs contribute to a high proportion of hatchery-origin spawners (pHOS; Figure 5.3-5) within the Wenatchee, Entiat, and Methow subbasins.



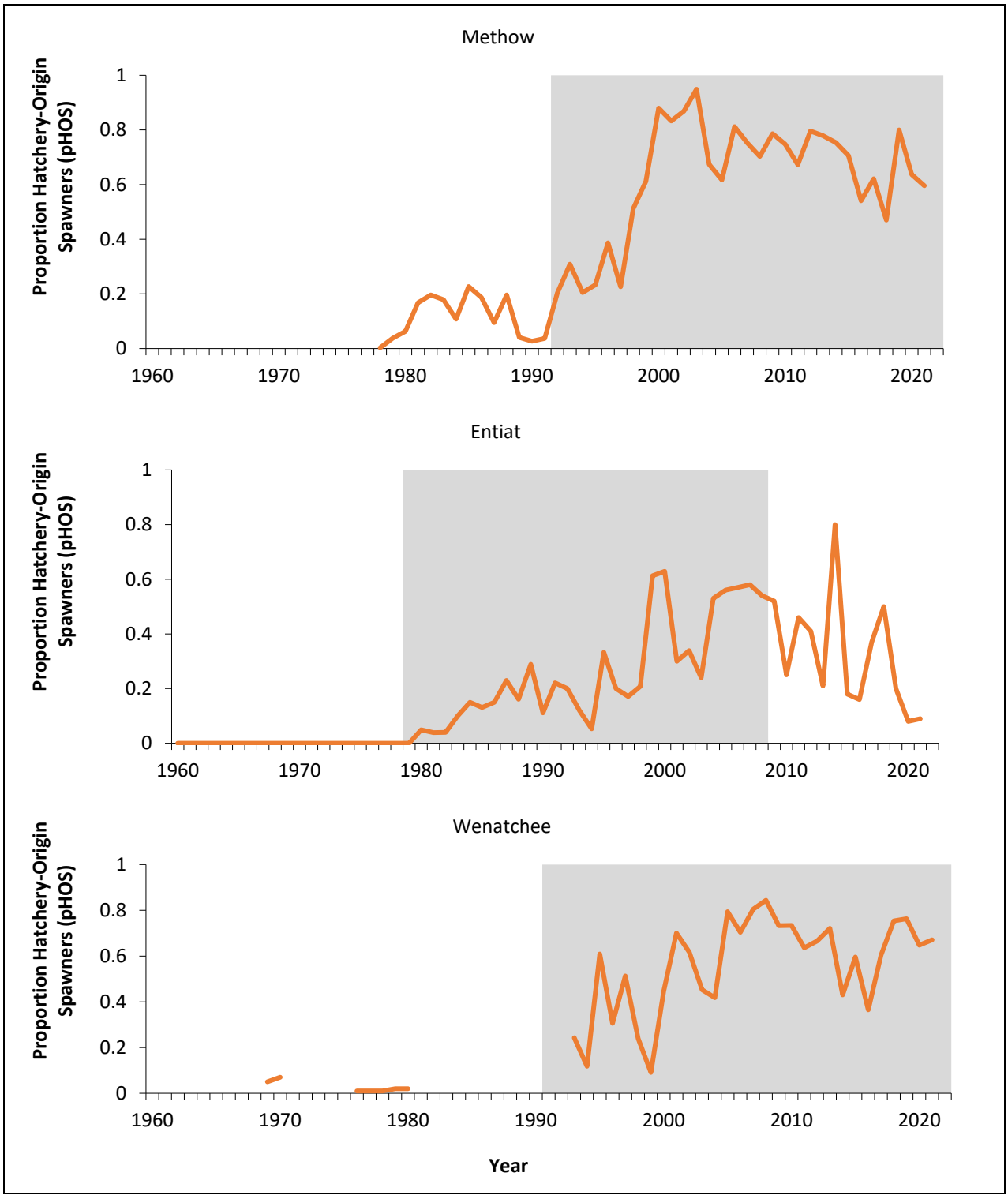
Source: WDFW 2023b

Figure 5.3-3 Upper Columbia Spring Chinook Salmon Evolutionary Significant Unit Natural and Hatchery Origin Spawning Escapement to the Wenatchee, Entiat, and Methow Subbasins, 1960 to 2021



Source: Fish Passage Center 2023

Figure 5.3-4 Rock Island Dam Spring Chinook Salmon Counts, 1989 to 2021



Sources: USFWS 2023b; WDFW 2023b
Note: Gray areas indicate periods of spring Chinook hatchery production.

Figure 5.3-5 Proportion of Hatchery Origin Spawners in the Methow, Entiat, and Wenatchee Subbasins, 1960 to 2021

Critical Habitat and Essential Fish Habitat

The Columbia River is designated critical habitat for UCR spring Chinook Salmon (NMFS 2005a) as a migration corridor. Critical habitat includes the stream channel(s) defined by the ordinary high water mark (OHWM) within the designated stream reaches.[35] This critical habitat in the Columbia River extends from the estuary upstream to Rock Island Dam and from Rock Island Dam upstream to Chief Joseph Dam. The Methow, Entiat, and Wenatchee subbasins are also listed as critical habitat. The Project is within the USGS HUC 1702001002 and HUC 1702001003 (Columbia River) and HUC 1702001105 (Lower Wenatchee River Watershed) where critical habitat has been defined.

Essential Fish Habitat (EFH) has been defined for Chinook Salmon as: 1) spawning and incubation; 2) juvenile rearing; 3) juvenile migration corridors; and 4) adult migration corridors and holding habitat (PFMC 2014). EFH includes all habitat currently or historically occupied by Chinook Salmon. The Rock Island Project is within HUC 1702001002 and HUC 1702001003 (Columbia River) and HUC 1702001105 (Lower Wenatchee River Watershed), which are designated as juvenile migration corridor and adult migration corridor and holding EFH.

Management

As discussed above, the UCR spring Chinook Salmon ESU is managed by NMFS. The Yakama Nation, WDFW, USFWS, Chelan PUD, Douglas PUD, Grant PUD, and other entities operate hatchery programs and work to conserve and restore habitat. Management efforts also include coordination and partnerships with NGOs and local governments. Aspects of management include developing and implementing population management and fisheries plans and design and implementation of hatchery programs, habitat protection and restoration programs, and research, monitoring, and evaluation of the various programs and their effects on the ESU.

Fisheries

UCR spring Chinook Salmon are incidentally harvested both in the ocean and in lower Columbia River fisheries (NMFS 2016a; Hillman et al. 2022; Snow et al. 2022). Nearly all harvest on hatchery-origin Chiwawa spring Chinook Salmon occurs within the Columbia River Basin (Hillman et al. 2022; Snow et al. 2022). Harvest of UCR spring Chinook Salmon in ocean fisheries appears to be low based on coded wire tag recoveries (Hillman et al. 2022). Non-selective tribal fisheries and selective sport harvest for spring Chinook Salmon occur in the lower Columbia River. Harvest impacts on ESA-listed species in Columbia River commercial, recreational, and treaty-reserved

[35] https://www.fisheries.noaa.gov/inport/item/65293.

fisheries continue to be managed under the 2018-2027 United States v. Oregon Management Agreement (NMFS 2018 and 2022).

The Wenatchee subbasin has both tribal harvest, a recreational fishery in Icicle Creek that targets hatchery origin returns from the Leavenworth NFH, and in some years a targeted Chiwawa River hatchery spring Chinook Salmon fishery (in the Wenatchee River) for conservation purposes to protect natural-origin spring Chinook Salmon genetics. The median harvest rate for the Chiwawa stock is 10.6 percent of the escapement, however, in some years, harvest is three to four times the median rate (Hillman et al. 2022). For the Methow population, mean harvest rates are below 8 percent for each of the three stocks (Methow, Twisp, and Chewuch), but have exceeded 36 percent in some brood year cohorts, with a high of 59 percent harvest of the Chewuch stock in 1997 (Snow et al. 2022).

Predation

Pinniped predation in the lower Columbia River is suspected to be a major source of non-harvest mortality for returning adult UCR spring Chinook Salmon. Wargo Rub et al. (2019) estimated that 20-44 percent of returning adult spring Chinook Salmon died of non-harvest mortality prior to reaching Bonneville Dam during 2010 to 2015. Modeling by Wargo Rub et al. (2019) indicated that increased California sea lion (*Zalophus californianus*) abundance explained decreased survival among spring Chinook Salmon during this period. More recently, Tidwell et al. (2019) documented increasing abundance and predation by Stellar sea lions (*Eumetopias jubatus*) on Chinook Salmon at Bonneville Dam. In recognition of the severity of pinniped predation occurring in the lower Columbia River, NMFS has provided state and tribal resource managers with expanded authority to lethally remove sea lions preying on ESA-listed salmonids such as UCR spring Chinook Salmon. Specifically, the Endangered Salmon Predation Prevention Act (Public Law 115-329) was enacted in 2018 and amends section 120 of the Marine Mammal Protection Act to authorize increased removals of predators for the purpose of conserving ESA-listed salmonids.

Habitat Conservation Plan Implementation

The Rock Island HCP's Passage Survival Plan requires Chelan PUD to achieve 91 percent Combined Adult and Juvenile Project Survival or 93 percent Juvenile Project Survival standards for yearling spring Chinook Salmon migrants (Section 4.3). Chelan PUD has achieved the Combined Adult and Juvenile Project Survival and Juvenile Project Survival standards (Phase III Standards Achieved) which was documented in both 10-year check-in periods since the Rock Island HCP was executed (Table 5.3-4) (Chelan PUD 2013 and 2023a; Chelan PUD and Anchor QEA 2021).

Table 5.3-4 Summary of Phase Designations and Project Survival at Rock Island by Yearling Spring Chinook Salmon Including Survival Standard and Date Achieved

SURVIVAL STUDY PERIOD	JUVENILE PROJECT SURVIVAL (PERCENT)	ADULT PROJECT SURVIVAL (PERCENT)	COMBINED JUVENILE AND ADULT PROJECT SURVIVAL (PERCENT)	ROCK ISLAND SPRING CHINOOK PHASE DESIGNATION
2002-2013	93.75	99.89	93.65	Phase III Standard Achieved
2014-2023	94.45	100.00	93.85	Phase III Standard Achieved

Sources: Chelan PUD 2023a; Chelan PUD and Anchor QEA 2021

Chelan PUD's current and historical UCR spring Chinook production levels are summarized in Table 5.3-5.

Table 5.3-5 Chelan PUD Habitat Conservation Plan No Net Impact Spring Chinook Salmon Production Targets for Rock Island and Rocky Reach Dams

PROJECT	SPECIES	INITIAL PRODUCTION (2002-2013)	RECALCULATED PRODUCTION (2014-2023)	RECALCULATED PRODUCTION (2024-2033)	RELEASE LOCATION
Rock Island	Spring Chinook Salmon	672,000[1]	144,026	144,000[2]	Chiwawa
		NA	52,313	56,903	Chief Joseph[3]
		144,000	0	0	Methow
Rocky Reach	Spring Chinook Salmon	144,000[1]	60,516	61,000	Methow/ Chewuch

Source: Chelan PUD 2023a

[1]Initial production levels greater than that required to compensate for unavoidable project mortality (produced to maintain capacity through the 2013 fish releases).

[2]Includes species trade of 22,911 of the 43,652 recalculated sockeye production plus 121,089 No Net Impact production.

[3]Mitigation based on measured unavoidable project mortality of the annual release targets for Chief Joe Hatchery.

In total, the annual production target for UCR spring Chinook Salmon upstream of Rock Island Dam is over 3 million smolts that are distributed among nine programs and six hatcheries, with additional acclimation sites (Table 5.3-6).

Table 5.3-6 Spring Chinook Salmon Hatchery Programs in the Upper Columbia River

HATCHERY	PROGRAM	HATCHERY OWNER	FUNDING SOURCE	BASIN OR SUBBASIN	RELEASE LOCATION	PROGRAM SIZE
Nason	Nason Creek No Net Impact (NNI)	Grant PUD	Grant PUD	Wenatchee	Nason Creek	203,650
Chiwawa	Chiwawa River NNI	Chelan PUD	Chelan PUD	Wenatchee	Chiwawa River	144,000
Leavenworth	Leavenworth National Fish Hatchery Spring Chinook Salmon	USFWS	USFWS and United States Bureau of Reclamation	Wenatchee	Icicle Creek	1,200,000
Methow	Twisp River	Douglas PUD	Douglas PUD	Methow	Twisp River	24,728
Methow	Methow Composite	Douglas PUD	Chelan PUD	Methow	Chewuch River	61,000
Methow	Methow Composite	Douglas PUD	Grant PUD	Methow	Methow River	134,000
Winthrop	Methow Spring Chinook Salmon	USFWS	USFWS	Methow	Methow River	400,000
Chief Joseph	10(j) Reintroduction	CTCR	CTCR, BPA, Grant PUD, Chelan PUD, and Douglas PUD	Okanogan	Okanogan River	200,000
Chief Joseph	Yearling	CTCR	CTCR, BPA, Grant PUD, Chelan PUD, and Douglas PUD	Columbia	Columbia River	700,000

Sources: Chelan PUD 2023a; CTCR 2021; Douglas PUD 2022; Grant PUD 2022; NMFS 2016b and 2017

Chelan PUD implements a comprehensive hatchery Monitoring and Evaluation Plan (M&E Plan; Hillman et al. 2019) to evaluate the performance of the UCR spring Chinook Salmon hatchery program relative to conservation and production objectives established by the HCP Hatchery Committees. The M&E Plan is updated every 10 years with revisions conducted as needed in interim years and is approved by members of the HCP Hatchery Committee.

An annual report is produced each year to summarize monitoring and evaluation activities and data collection consistent with the M&E Plan. Additional reporting includes a Statistical Report every 5 years and a Comprehensive Monitoring and Evaluation Report (comprehensive report) every 10 years. The annual reports, 5-year Statistical Reports, and particularly the 10-year Comprehensive Reports are used to assess the performance of hatchery programs, adjust the programs, and refine the M&E Plan. The most recent comprehensive report was completed in 2023.

In addition to Passage Survival and Hatchery Compensation plans, Chelan PUD also funds projects for the protection and restoration of tributary habitat for UCR spring Chinook Salmon through implementation of the Rock Island HCP's Tributary Plan. Specifically, Chelan PUD funds a Plan Species Account to support habitat restoration and protection projects within the Columbia River watershed (from the Chief Joseph Dam tailrace to the Rock Island Dam tailrace) and in the Okanogan, Methow, Entiat, and Wenatchee River tributaries. The habitat projects are intended to compensate for up to 2 percent of Unavoidable Project Mortality of Plan Species. The HCP Tributary Committee administer this fund.

The HCP Tributary Committees make funding decisions on project proposals from project sponsors, which have included the CTCR, Yakama Nation, federal and county governments, and local conservation groups. The Tributary Committees work closely with the UCSRB Regional Technical Team that identifies high priority habitat actions in priority areas within each of the Wenatchee, Entiat, Methow, and Okanogan subbasins. The HCP Tributary Committees' extensive knowledge of the subbasins, limiting habitat factors, threats, and limiting life stages is used to make funding decisions. Since inception of the Rock Island Tributary Plan, the Chelan PUD Tributary Fund has contributed $8,496,000 to fund 59 projects (Table 5.3-7). Project foci range from assessments to fish passage to protection and restoration of stream and riparian habitat.

Table 5.3-7 Rock Island Tributary Plan Project Summary

PROJECT TYPE	NUMBER OF PROJECTS	TRIBUTARY PLAN CONTRIBUTION (U.S. DOLLARS)
Assessment	9	299,497
Channel Restoration	2	297,171
Fish Passage	8	1,639,000
Instream Flows	7	2,286,860
Instream Structures	10	737,477
Instream Struct/Off-Channel	2	260,954
Nutrients	1	267,650
Off-Channel Habitat	7	501,899
Protection	11	2,171,439
Riparian Habitat	2	34,053
Total	59	8,496,000

Source: Chelan PUD 2023a

5.3.6.3 Upper Columbia River Summer/Fall Chinook Salmon

Life History

In the UCR, most summer/fall Chinook Salmon are "ocean-type" fish, with juveniles initiating their seaward migration as subyearlings (Groot and Margolis 1991). Most returning spawners are 4 to 5 years old (Myers et al. 1998). Males that return after one sea-winter are commonly referred to as jacks. Some males (precocious parr and minijacks) do not migrate to the ocean and instead mature in their second year of life; these life histories are more prevalent in hatchery-origin fish (Harstad et al. 2014).

Adult summer/fall Chinook Salmon return to the Columbia River from the ocean between May and early August. Summer-run fish typically enter Columbia River tributaries between May and mid-August, while fall-run fish enter tributaries between mid-August and October (Fulton 1968). Homing to their natal stream is accomplished through olfactory imprinting (Quinn 2005). Unlike most UCR spring Chinook, summer/fall Chinook Salmon tend to migrate rapidly upriver to spawning areas and spawn within days to weeks of river entry (Groot and Margolis 1991). Spawning occurs between September and November; earlier-arriving adults typically spawn in Columbia River tributaries, while later-arriving fish typically spawn in the mainstem Columbia River, including in the tailraces of dams (Peven 2003; Mann and Snow 2018). Spawning sites commonly feature strong subsurface flow, which provides optimal egg oxygenation. Other spawning habitat characteristics are highly variable: spawning substrate can range from fine gravel to large cobble, and spawning depths can range from 0.3 ft. to more than 23 ft (0.1 m to ≥ 7 m) (Groot and Margolis 1991; Peven 2003). Due to their large size, summer/fall Chinook Salmon may

spawn in deeper and faster-flowing water than other salmonid species, as they are better able to hold position and can mobilize coarser gravel and cobble during redd construction (Groot and Margolis 1991). Eggs incubate in the stream substrate through winter and early spring.

Following emergence in April and May, young fry tend to distribute downstream and occupy stream margins where water is slower, shallower, and features finer substrate. However, Chinook Salmon fry can be found in virtually every habitat in small numbers (Groot and Margolis 1991). Summer/fall Chinook Salmon predominantly exhibit an "ocean-type" life-history and migrate to the ocean as subyearlings. Although most subyearlings rear in freshwaters for 2 to 5 months prior to migration, some initiate seaward migration shortly after yolk absorption, while others rear in tributaries until late summer or fall of their first year (Groot and Margolis 1991). A majority of subyearling summer/fall Chinook Salmon in the UCR are detected migrating downstream between early May and early August (DART 2023a), using the mainstem subbasin tributaries and the Columbia River as a migratory corridor. A small proportion of summer/fall Chinook Salmon migrate downstream as yearlings (after 1 year in freshwater) between early April and early June; peak yearling migration occurs in May (DART 2023a).

Following downstream migration, subyearling summer/fall Chinook Salmon migrants rear in the Columbia River estuary. Although summer/fall Chinook Salmon can be found in the estuary year-round, their abundance is highest between May and September (McCabe et al. 1986). Subyearlings tend to occupy littoral zones in the upper estuary and transition into progressively deeper and more saline pelagic waters as they grow (McCabe et al. 1986; Roegner and Teel 2014). After weeks to months in the estuary, summer/fall Chinook Salmon move into offshore waters; this transition tends to be slower than that of spring Chinook Salmon (McMichael et al. 2013).

Summer/fall Chinook Salmon from the Columbia River travel north in the ocean, with a coastal distribution along the continental shelf that ranges from British Columbia to Alaska. Upon ocean entry, survival and growth in the ocean are strongly influenced by a complex interaction of sea surface temperatures, upwelling, currents, predators, and food supply (Quinn 2005). Chinook Salmon may achieve 99 percent or more of their lifetime growth at sea (Quinn 2018).

Adult Migration through the Rock Island Project

Upstream passage of summer/fall Chinook Salmon occurs at the Rock Island Adult Fishways between May and December with the majority of fish passing between June and August. The median (50 percent) passage date is July 10 (Figure 5.3-6) (DART 2023a). After passing Rock Island Dam fish move upstream of the dam and disperse to spawn in their natal tributaries and mainstem Columbia River. Summer Chinook Salmon adults occupy the Rock Island Project from May to August. Most summer Chinook Salmon bound for the Wenatchee subbasin enter the river by

August. Counts at Tumwater Dam indicate that peak movement upstream in Wenatchee subbasin is in early August and most of the run has passed Tumwater Dam by early October (Hillman et al. 2022).

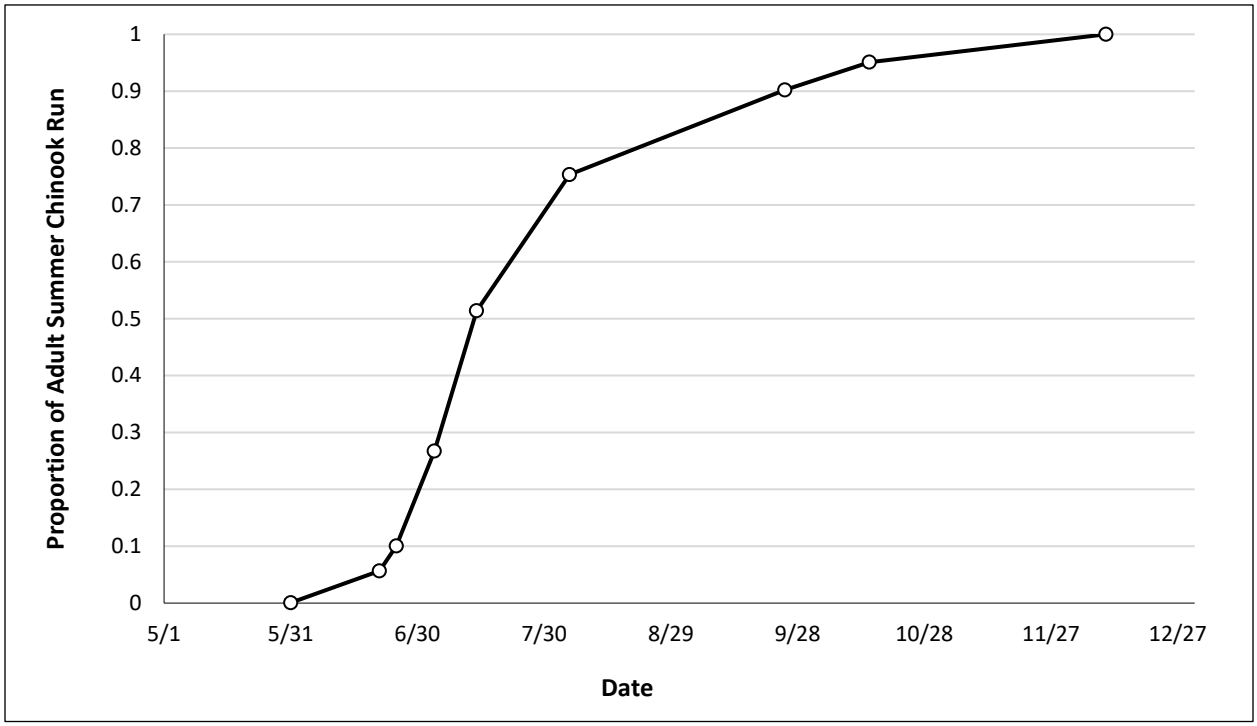


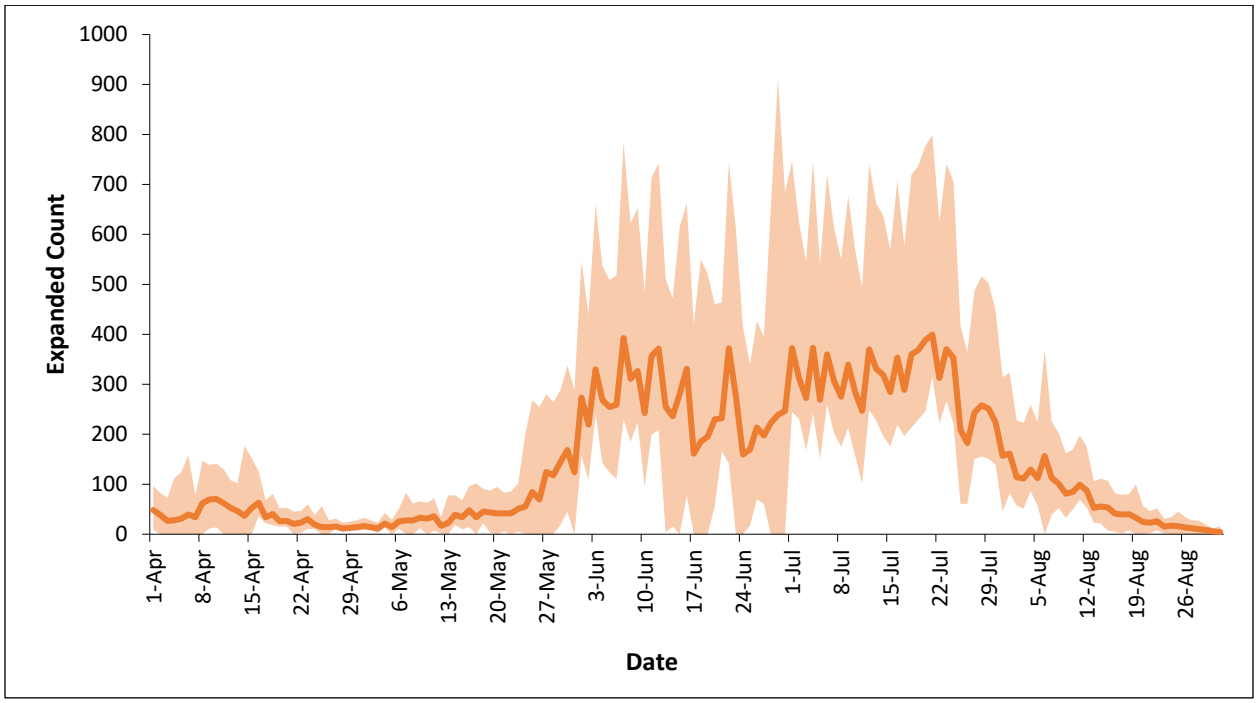
Figure 5.3-6 Cumulative Seasonal Run Timing for Summer/Fall Chinook Salmon at Rock Island Adult Fishways During the Period of 2002 to 2022

Adult Conversion Rate

Among summer Chinook Salmon known to originate from tributaries upstream of the Rock Island Project, the conversion rate of migrating adults between Rock Island Dam and Rocky Reach Dam, even considering harvest that occurs within the Rock Island Project, is 98.7 percent based on available PIT-tag data from 2006-2022 (DART 2023b).

Subyearling Migration through the Rock Island Project

The majority of summer/fall Chinook Salmon subyearlings pass the Rock Island Project during the months of June and July (Figure 5.3-7) (Chelan PUD 2023b) and the run is typically complete by the end of August (DART 2023a). The habitat in the Rock Island Project is primarily a migratory corridor for subyearling summer/fall Chinook Salmon; however, rearing may also occur. The ISAB (2018) reported that some summer Chinook Salmon juveniles overwinter in the Entiat River and in Columbia River mainstem reservoirs (Table 5.3-8).



Source: Chelan PUD 2023b

Figure 5.3-7 Rock Island Juvenile Bypass Age-0 Chinook Salmon expanded Counts, Median with 95% Confidence Intervals, 2010-2021

Table 5.3-8 Summer/Fall Chinook Salmon Use of the Rock Island Project

LIFE HISTORY STAGE	TIMING	HABITAT USE	DESCRIPTION
Adult	May to October	Migration Corridor and Holding	Returning adults use the Columbia River as a migration corridor. Some adults spawn in the mainstem Columbia River.
Incubation	September to May	Egg Incubation	Some spawning occurs in the mainstem Columbia River.
Juvenile	Year-round	Migration, Overwintering	A majority of juveniles migrate as subyearlings and use the Rock Island Project as a migration corridor. Some summer Chinook Salmon may overwinter in the Columbia River.
Smolt	April to June	Migration	A small proportion of juveniles migrate as yearlings and use the Rock Island Project as a migration corridor.

Sources: Chelan PUD 2023a; DART 2023a; ISAB 2018

Status

Endangered Species Act Consultation Record

The UCR summer/fall Chinook Salmon ESU is not listed under the ESA.[36] Nevertheless, in support of including summer/fall Chinook Salmon as a covered species under the Rock Island Incidental Take Permit (Permit No. 1393), NMFS conducted an analysis of potential impacts on these unlisted populations. This analysis for unlisted species was included along with NMFS' BiOp on ESA-listed species (NMFS 2003a and 2003b). The unlisted species analysis concluded that the proposed permits would not jeopardize the continued existence of UCR summer/fall Chinook Salmon (Table 5.3-9).

Table 5.3-9 Endangered Species Act Documents Related to Summer/Fall Chinook Salmon in the Upper Columbia River

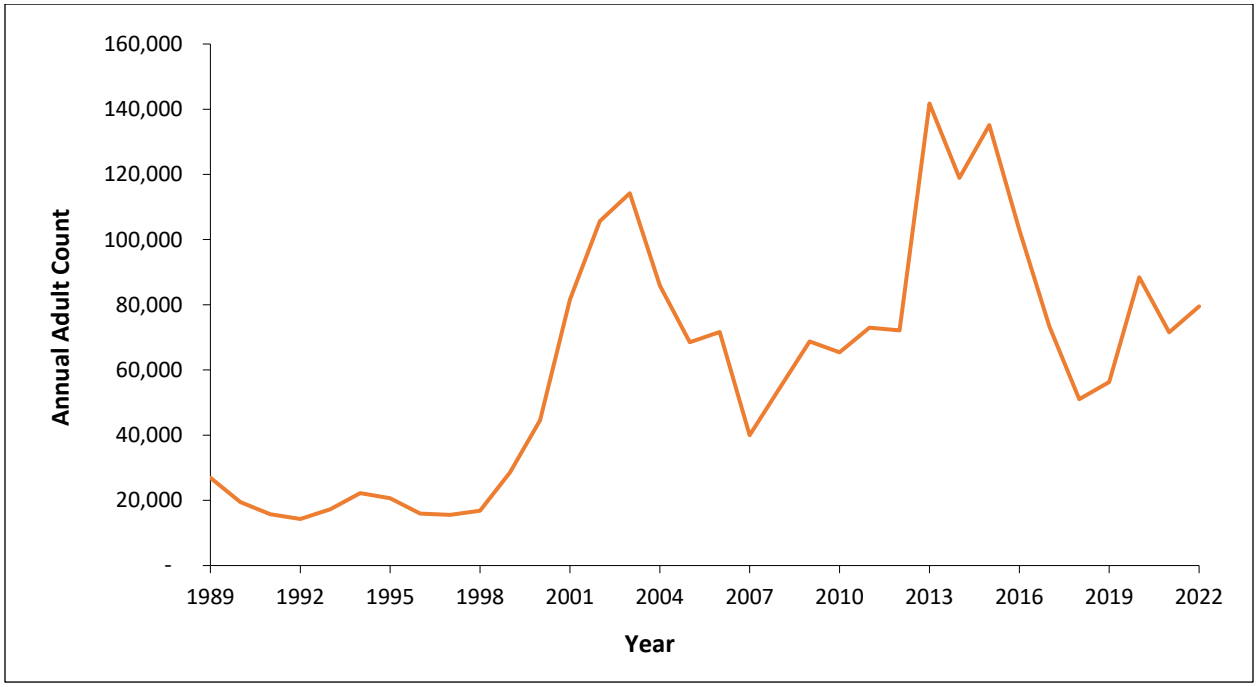
DOCUMENT	DATE	AUTHOR	DESCRIPTION
Biological Opinion, Unlisted Species Analysis, and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Chelan County for the Rock Island Hydroelectric Project (FERC No. 943) Anadromous Fish Agreement and Habitat Conservation Plan and Construction of a Small Turbine Unit in the Attraction Water Conduit of the Left Bank Adult Fishway (Permit No. 1393)	2003a	NMFS	"No jeopardy" unlisted species analysis for issuance of Incidental Take Permit for Rock Island Anadromous Fish Agreement and HCP
Permit for Incidental Take of Endangered/Threatened Species (Permit No. 1393)	2003b	NMFS	Section 10 ESA permit issued to Chelan PUD

Population Trends

Abundance has increased over the past 3 decades both in terms of adult counts at the Rock Island Adult Fishways (Figure 5.3-8) and total number of spawners reaching the spawning grounds (Figure 5.3-9). In the 2 decades since the Rock Island and Rocky Reach HCPs were implemented, the number of UCR summer Chinook Salmon passing Rock Island Dam has averaged 81,869 fish (DART 2023c) and an average of 18,806 have spawned in the Wenatchee, Methow, and Okanogan rivers annually (WDFW 2023b). Although hatchery production has contributed to the abundance of UCR summer/fall Chinook Salmon, most of the spawners are natural-origin fish (Figure 5.3-10). Over the past 2 decades, the average pHOS on the spawning grounds of the Wenatchee, Methow, and Okanogan rivers has remained below 0.5. The highest average values have been observed in

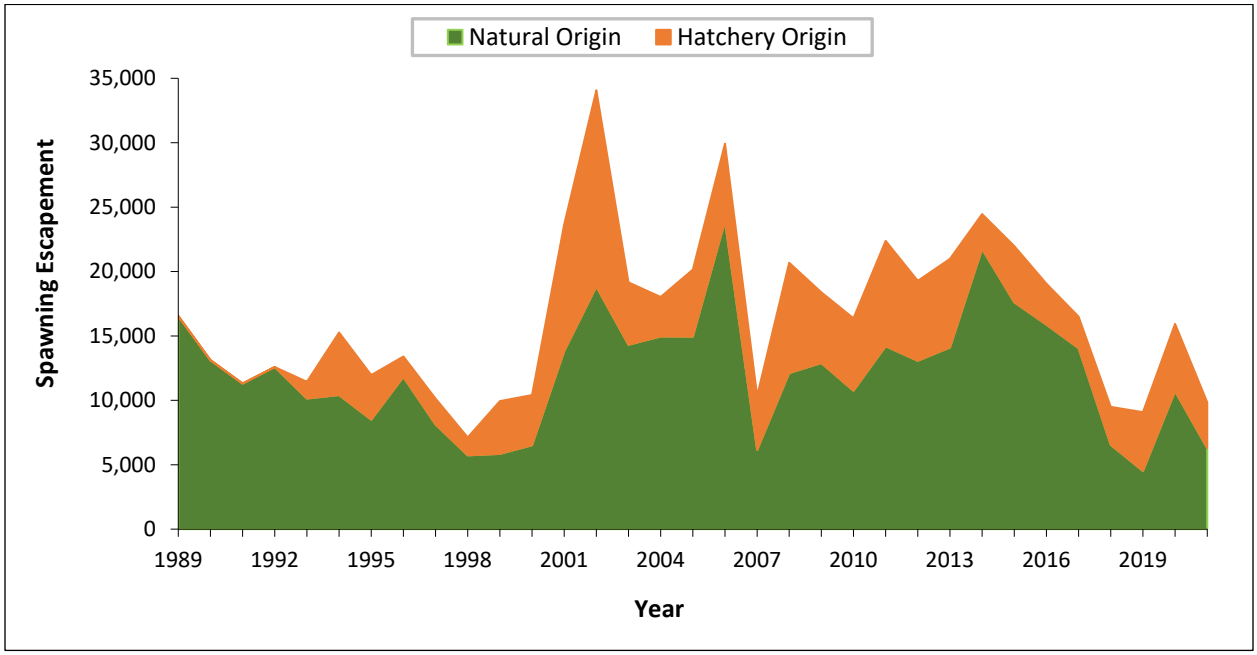
[36] https://www.fisheries.noaa.gov/species/chinook-salmon-protected#overview.

the Methow River (pHOS = 0.42), and the lowest values have been observed in the Wenatchee River (pHOS = 0.20; Figure 5.3-10) (WDFW 2023b).



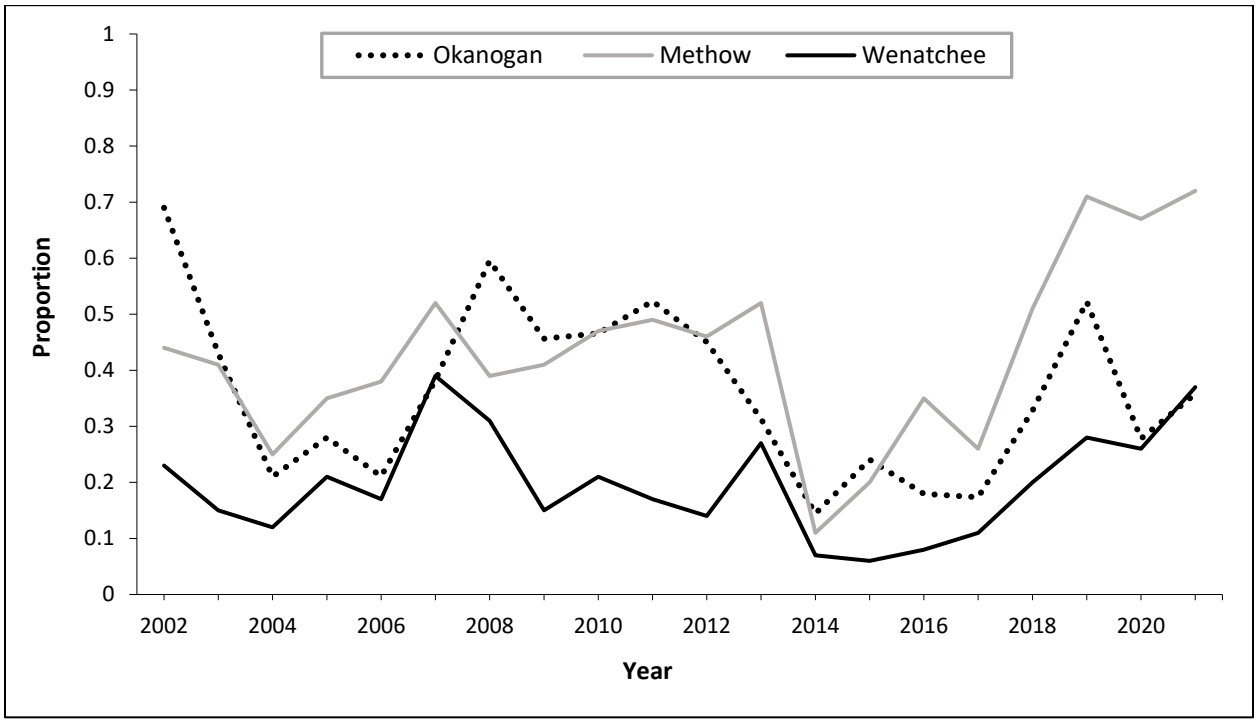
Source: DART 2023c

Figure 5.3-8 Rock Island Dam Annual Adult Summer/Fall Chinook Salmon Counts, 1989 to 2022



Source: WDFW 2023b

Figure 5.3-9 Upper Columbia Summer/Fall Chinook Salmon Spawning Escapement (Okanogan, Methow, Wenatchee Subbasins Combined), 1989 to 2021



Source: WDFW 2023b

Figure 5.3-10 Proportion of Hatchery Origin Spawners in the Okanogan, Methow, and Wenatchee Subbasins, 1998 to 2021

Essential Fish Habitat

EFH has been defined for Chinook Salmon as: 1) spawning and incubation; 2) juvenile rearing; 3) juvenile migration corridors; and 4) adult migration corridors and holding habitat (PFMC 2014). EFH includes all habitat currently or historically occupied by Chinook Salmon. The Rock Island Project is within the USGS HUC 1702001002 and HUC 1702001003 (Columbia River) and HUC 1702001105 (Lower Wenatchee River Watershed) and that contains juvenile migration corridor and adult migration corridor and holding EFH.

Management

The Yakama Nation, WDFW, USFWS, Chelan PUD, Douglas PUD, Grant PUD, and other entities operate hatchery programs and work to conserve and restore habitat. Management efforts also include coordination and partnerships with NGOs and local governments. Aspects of management include developing and implementing population management and fisheries plans and design and implementation of hatchery programs, habitat protection and restoration programs, and research, monitoring, and evaluation of the various programs and their effects on the ESU.

Fisheries

UCR summer/fall Chinook Salmon are harvested both in the ocean and Columbia River fisheries (Hillman et al. 2022; Snow et al. 2022). Ocean fisheries remove the greatest percentage of fish, followed by tribal, commercial (zones 1-5), and recreation fisheries (Hillman et al. 2022; Snow et al. 2022). Harvest of summer/fall Chinook Salmon in the Columbia River commercial, recreational, and treaty fisheries is managed under the 2018-2027 United States v. Oregon Management Agreement (NMFS 2022). The median rate of harvest for the Wenatchee, Okanogan, and Methow summer/fall Chinook Salmon stocks is 63 percent, 61 percent, and 56 percent, respectively (Hillman et al. 2022).

Habitat Conservation Plan Implementation

The Rock Island HCP's Passage Survival Plan requires Chelan PUD to achieve 91 percent Combined Adult and Juvenile Project Survival or 93 percent Juvenile Project Survival for summer/fall Chinook Salmon subyearlings. Early in HCP implementation, measurement of subyearling juvenile project survival was deemed by the HCP Coordinating Committee to be impractical due to technology limitations and uncertainties surrounding the subyearling life history. Chelan PUD continues to work with the HCP Coordinating Committee to review advancements in tag technology and evaluate options for future compliance studies. As part of these ongoing efforts, Chelan PUD has conducted preliminary evaluations of subyearling behavior and passage at Rock Island in 2021 and 2022 to determine if advancements in tag technology are sufficient to develop a valid subyearling survival study. Currently, Chelan PUD has met the Phase III Additional Juvenile Studies standard for subyearlings under the Rock Island HCP (Table 5.3-10) (Chelan PUD and Anchor QEA 2021; Chelan PUD 2023a).

Table 5.3-10 Summary of Phase Designations and Project Survival at Rock Island by Subyearling Summer/Fall Chinook Salmon Including Survival Standard and Date Achieved

YEARS OF STUDY	ROCK ISLAND SUMMER/FALL CHINOOK SALMON PHASE DESIGNATION	NOTE
2021-2022	Phase III Additional Juvenile Studies	Juvenile Project Survival standards maintained through monitoring evolution in tag technology and study methodology

Sources: Chelan PUD 2023a; Chelan PUD and Anchor QEA 2021

As part of the Rock Island and Rocky Reach HCPs, Chelan PUD provides funding and capacity for UCR summer/fall Chinook Salmon production at multiple hatchery facilities (Table 5.3-11). Hatchery production values are recalculated every 10 years to adjust for changes in Project survival and hatchery performance. The most recent recalculation was completed in 2022. Current and historical production targets for the Rock Island and Rocky Reach HCPs are summarized in Table 5.3-11. In total, the annual production target for UCR summer/fall Chinook Salmon upstream of

Rock Island Dam is over 3.8 million smolts that are produced by five different programs (Table 5.3-12).

Table 5.3-11 Chelan PUD Habitat Conservation Plan Summer/Fall Chinook Salmon Production Targets for Rock Island and Rocky Reach Dams

PROJECT	INUNDATION	INITIAL PRODUCTION (THROUGH 2013)	RECALCULATED PRODUCTION (2014-2023)	RECALCULATED PRODUCTION (2024-2033)	REARING LOCATION
Rock Island	-	864,000[1]	318,000	293,776[3]	Dryden
	-	200,000[1]	0	0	Carlton
	-	NA	75,563[2]	146,208[4]	Chief Joseph[7]
	-	NA	45,570[2]	41,397	Chief Joseph (Subyearling)
Rocky Reach	400,000[5]	200,000	176,000	135,283[6]	Chelan Falls
	-	200,000[1]	0	0	Carlton
	-	NA	91,000[2]	187,794[4]	Chief Joseph[7]
	-	NA	49,000[2]	53,173[2]	Chief Joseph (Subyearling)

Source: Chelan PUD 2023a

[1]Initial production levels greater than that required to compensate for unavoidable project mortality (produced to maintain capacity through the 2013 releases).

[2]Mitigation based on measured unavoidable project mortality of the annual release targets for Chief Joe Hatchery.

[3]Includes species trade of 18,780 of the 43,652 recalculated sockeye production plus 274,996 No Net Impact (NNI) production.

[4]Mitigation based on measured unavoidable project mortality of the annual release targets for Chief Joe Hatchery and Biological Assessment Management Plan calculated mitigation for natural-origin smolt production.

[5]Summer Chinook Salmon inundation production was initially met through production of 1.62M subyearling releases from Turtle Rock Island. The Hatchery Committee subsequently converted this production to yearling releases and moved the program to Chelan Falls Acclimation Ponds.

[6]Includes species trade of 1,961 of the 43,652 recalculated sockeye production plus 133,322 NNI production.

[7]Mitigation based on measured unavoidable project mortality of the annual release targets for Chief Joe Hatchery.

Table 5.3-12 Summer/Fall Chinook Salmon Hatchery Programs in the Upper Columbia River

HATCHERY	HATCHERY OWNER	FUNDING SOURCE	PROGRAM	BASIN OR SUBBASIN	RELEASE LOCATION	PROGRAM SIZE
Eastbank/Dryden	Chelan PUD	Chelan PUD and Grant PUD	Yearling	Wenatchee	Wenatchee River	500,000
Chelan Falls	Chelan PUD	Chelan PUD	Yearling	Columbia	Columbia River	535,283
Wells	Douglas PUD	Douglas PUD	Yearling	Methow	Methow River	35,437
			Yearling	Columbia	Columbia River	320,000
			Subyearling	Columbia	Columbia River	484,000
Carlton	Chelan PUD	Grant PUD	Yearling	Methow	Methow River	165,533
Chief Joseph	CTCR	Chelan PUD, Douglas PUD, Grant PUD, BPA	Yearling	Okanogan	Similkameen River	400,000
			Yearling	Okanogan	Okanogan River	400,000
			Subyearling	Okanogan	Okanogan River	300,000
			Yearling	Columbia	Columbia River	300,000
			Subyearling	Columbia	Columbia River	400,000
Entiat National Fish Hatchery	USFWS	United States Bureau of Reclamation	Yearling	Entiat	Entiat River	400,000

Sources: Chelan PUD 2023a; CTCR 2022; Douglas PUD 2022; Grant PUD 2022; USFWS 2023b

In addition to hatchery production, Chelan PUD also funds a comprehensive hatchery monitoring and evaluation program that is designed to evaluate the performance of the UCR summer/fall Chinook Salmon hatchery program relative to conservation and production objectives established by the HCP Hatchery Committees. This program is described in additional detail within Section 4.3. Chelan PUD also contributes funding for summer/fall Chinook Salmon production and monitoring and evaluation programs conducted in the Okanogan subbasin by CTCR (e.g., Pearl et al. 2021).

In addition to Passage Survival and Hatchery Compensation Plans, Chelan PUD also funds projects for the protection and restoration of tributary habitat for UCR summer/fall Chinook Salmon through implementation of the Rock Island HCP's Tributary Plan. See Table 5.3-7 for information on the Chelan PUD Tributary Fund.

5.3.6.4 Coho Salmon

Coho Salmon are a widely distributed, anadromous, and semelparous species in the genus *Oncorhynchus*. The species ranges from California to Alaska and is also found in northern Japan and eastern Russia (Groot and Margolis 1991).

Coho Salmon were extirpated from the interior Columbia River (upstream of Bonneville Dam) by the 1980s, following decades of declines due to overharvest, hydropower operations, habitat degradation, and hatchery practices (Galbreath et al. 2014). In 1996, the Yakama Nation initiated the Mid-Columbia Coho Restoration Program (MCCRP), which endeavors to "re-establish naturally spawning Coho Salmon populations in Mid-Columbia tributaries to biologically sustainable levels which provide significant harvest in most years" (Yakama Nation Fisheries Resource Management [YNFRM] 2017). MCCRP was developed as a five-phase program, beginning with development of a Mid-Columbia broodstock from Lower Columbia Coho Salmon populations and moving toward natural production of Coho Salmon locally adapted to the natural environment (YNFRM 2017). MCCRP efforts are currently underway in the Wenatchee and Methow River basins.

Life History

Most juvenile Coho Salmon rear in natal freshwaters for 1 year and migrate to sea as smolts in spring. Both female and male Coho Salmon typically spend 1 year at sea (two summers) and mature at 3 years old (Groot and Margolis 1991). However, deviations to this predominant life-history pattern do occur: males that return to spawn after 4 to 6 months at sea (one summer) are commonly referred to as jacks, and both males and females may remain in freshwater for an additional winter and return to spawn as 4-year-old fish (Drucker 1972).

Adult Coho Salmon return to the Columbia River from the ocean between July and September. Homing to their natal tributary is accomplished through olfactory imprinting (Quinn 2005). Adults

migrate upstream, tending to move quickly through riffles and hold in deep pools. Spawning takes place between October and December, typically in small streams with suitable gravel substrate and groundwater flow. Female Coho Salmon typically site redds at the heads of riffles where water is highly oxygenated (Groot and Margolis 1991; Shapovalov and Taft 1954). The relatively late spawn timing of adult Coho Salmon, as compared to other species, enables spawning in smaller tributaries where low flows may preclude access until fall (Quinn 2018). Eggs incubate in the gravel over the winter, and fry emerge the following spring.

After emergence, Coho Salmon fry may move up- or downstream to seek out slow-water, off-channel rearing habitats. Preferred habitats include side channels, wetlands, ponds, and sloughs featuring ample cover, such as overhanging vegetation or large woody debris (Nickelson et al. 1992). As fry transition to the parr stage, they shift to deeper and swifter water and become increasingly territorial (Groot and Margolis 1991). Parr tend to overwinter in structurally complex freshwater habitats that feature relatively stable depth, velocity, and water quality, including mainstem and off-channel pools (Nickelson et al. 1992). Coho Salmon parr typically begin the physiological transformation to the smolt stage in the early spring after 1 year in freshwater. However, in coastal watersheds some fry and parr migrate downstream to the estuary in the fall of their first year, where they may exhibit a combination of estuarine and freshwater rearing strategies prior to seaward migration the following spring (Miller and Sadro 2003; Jones et al. 2014).

Most Coho Salmon smolts initiate their downstream migration between March and June coincident with the spring freshet; the spring migration may also be cued by lengthening photoperiod, increasing water temperatures, and lunar phase (Groot and Margolis 1991; DeVries et al. 2011). The migratory corridor consists of the mainstems of subbasin tributaries and the Columbia River. Smolts are silver with counter-shaded coloration in preparation for life in open water. Upon entering the Columbia River estuary, smolts complete the physiological transition to saltwater and can grow rapidly due to abundant estuarine food resources (Simenstad et al. 1982).

After entering marine waters, Coho Salmon tend to travel slowly and remain in coastal waters along the continental shelf. While most Coho Salmon from the Columbia River travel northward, with marine distributions ranging from Washington to British Columbia, some move south and occupy the offshore waters of Oregon and California (Weitkamp and Neely 2002). Broadly, survival and growth in the ocean are influenced by a complex interaction of sea surface temperatures, upwelling, currents, predators, and food supply (Quinn 2005). Coho Salmon may achieve 99 percent or more of their lifetime growth at sea (Quinn 2018).

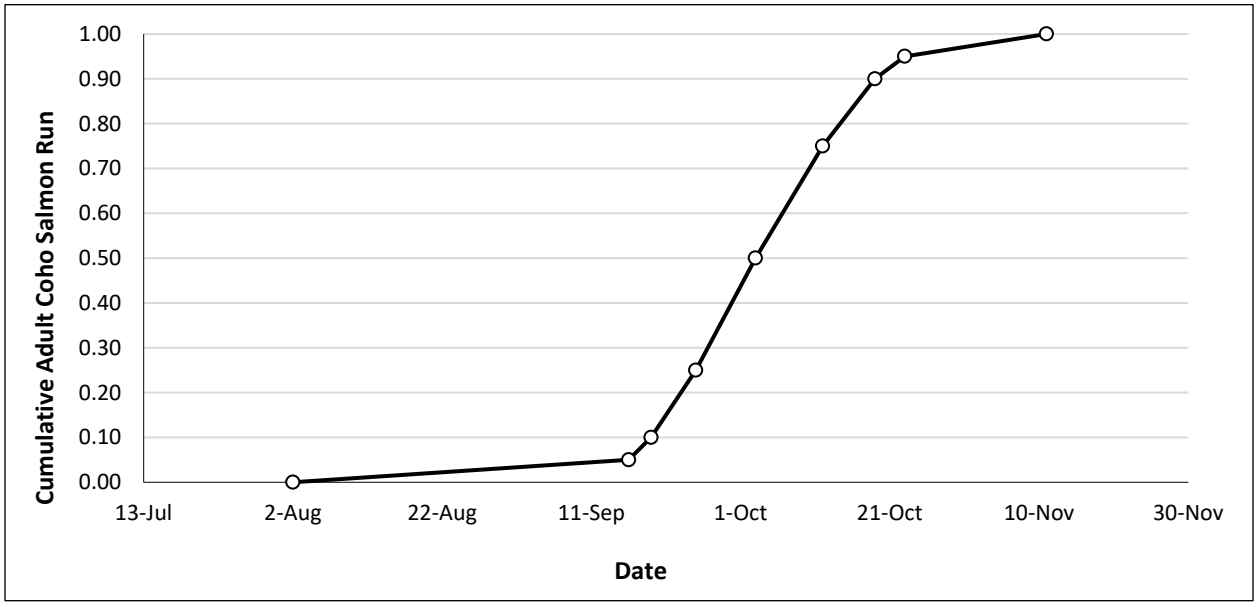
Adult Migration Through the Rock Island Project

Upstream passage of Coho Salmon occurs at the Rock Island Adult Fishways between August and November (Table 5.3-13) with the majority of fish passing between September and October (Figure 5.3-11) (DART 2023a). Most fish bound for the Wenatchee subbasin enter the river by October. Counts at Tumwater Dam indicate that peak movement upstream in Wenatchee subbasin is in mid-October, and most of the run has passed Tumwater Dam by end of October (DART 2023a; Hillman et al. 2022).

Table 5.3-13 Coho Salmon Use of the Rock Island Project

LIFE HISTORY STAGE	TIMING	HABITAT USE	DESCRIPTION
Adult	August-November	Migration Corridor	Returning adults use the Columbia River as a migration corridor.
Incubation	NA	None	Spawning and incubation take place in subbasin tributaries.
Juvenile	NA	NA	The extent to which subyearling Coho Salmon inhabit the Rock Island Project is unknown.
Smolt	April-June	Migration Corridor	Smolts use the Columbia River as a migration corridor.

Sources: Chelan PUD 2023a; DART 2023a



Source: DART 2023a

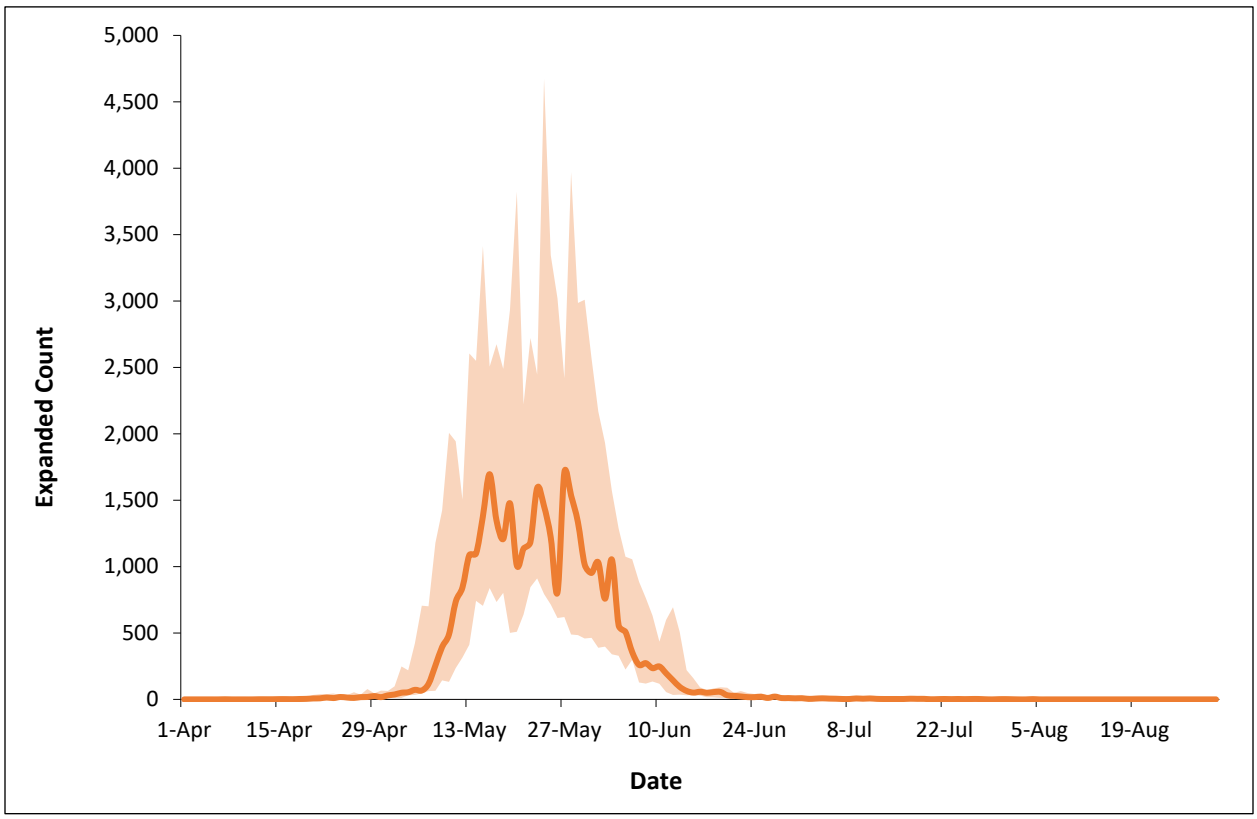
Figure 5.3-11 Cumulative Seasonal Run Timing for Coho Salmon at Rock Island Adult Fishways During the Period of 1998 to 2022

Adult Conversion Rate

Among Coho Salmon known to originate from tributaries upstream of the Rock Island Project, the conversion rate of migrating adults between Rock Island Dam and Rocky Reach Dam, even considering harvest that occurs within the Rock Island Project, is 96.7 percent based on available PIT-tag data from 2008-2022 (DART 2023b).

Smolt Migration through the Rock Island Project

Coho Salmon smolts migrate downstream past the Rock Island Project during the months of April to June with the majority passing May and June (Figure 5.3-12). The median date of arrival at Rock Island Dam is April 6. The median date of 50 percent passage is May 24. The median date for passage through the Rock Island Project for 95 percent of the smolts is June 9. The median date of the last passage at Rock Island Dam is August 19 (DART 2023a). The habitat in the Rock Island Project is considered a migratory corridor for juvenile Coho Salmon (Table 5.3-13) (PFMC 2014).



Source: Chelan PUD 2023a

Figure 5.3-12 Rock Island Juvenile Bypass Age-1 Coho Salmon Expanded Counts, Median with 95% Confidence Intervals, 2010 to 2022

Status

Endangered Species Act Consultation Record

UCR Coho Salmon population(s) were extirpated (Nehlsen et al. 1991) in the 20th century (Galbreath et al. 2014) and are currently being reintroduced to the Wenatchee and Methow subbasins (YNFRM 2017). UCR Coho Salmon are not listed under the ESA and have not been identified as an ESU (Weitkamp et al. 2000) but are considered a Plan Species under the HCP.

In 2003, as part of its Section 7 BiOp on issuance of the Section 10 Incidental Take Permit for Rock Island, NMFS included an analysis of potential impacts to Coho Salmon from operation of the Rock Island Project and implementation of the HCP. This analysis for unlisted Coho Salmon was included in NMFS's BiOp on its issuance of the Incidental Take Permit (NMFS 2003a and 2003b). NMFS concluded that the proposed permit would not jeopardize the existence of unlisted UCR Coho Salmon, once established (Table 5.3-14). Although Coho Salmon are an HCP Plan Species, NMFS did not include them in the Incidental Take Permit for Rock Island because at the time of HCP execution Coho Salmon were considered functionally extinct in the UCR (NMFS 2003a and 2003b). The HCP, however, did contemplate an experimental reintroduction and Coho Salmon are included as a Plan Species to ensure equivalent protection and mitigation measures among all anadromous species. Should this population ever become an ESA-listed ESU, the Rock Island Incidental Take Permit would be modified to include it as a permitted species pursuant to Section 10.1.3 of the HCP.

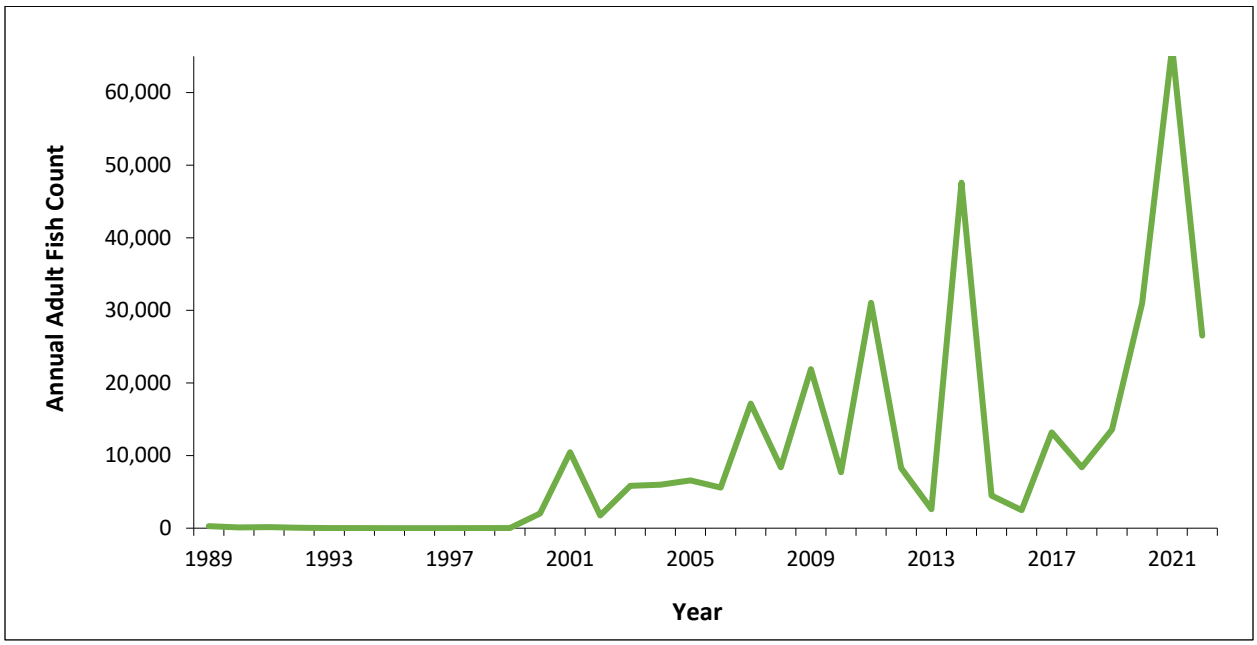
Table 5.3-14 Endangered Species Act and Management Documents Related to Unlisted Coho Salmon in the Upper Columbia River

DOCUMENT	DATE	AUTHOR	DESCRIPTION
BiOp, Unlisted Species Analysis, and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Chelan County for the Rock Island Hydroelectric Project (FERC No. 943) Anadromous Fish Agreement and Habitat Conservation Plan and Construction of a Small Turbine Unit in the Attraction Water Conduit of the Left Bank Adult Fishway	2003a	NMFS	"No jeopardy" unlisted species analysis for issuance of Incidental Take Permit for Rock Island Anadromous Fish Agreement and HCP

Population Trends

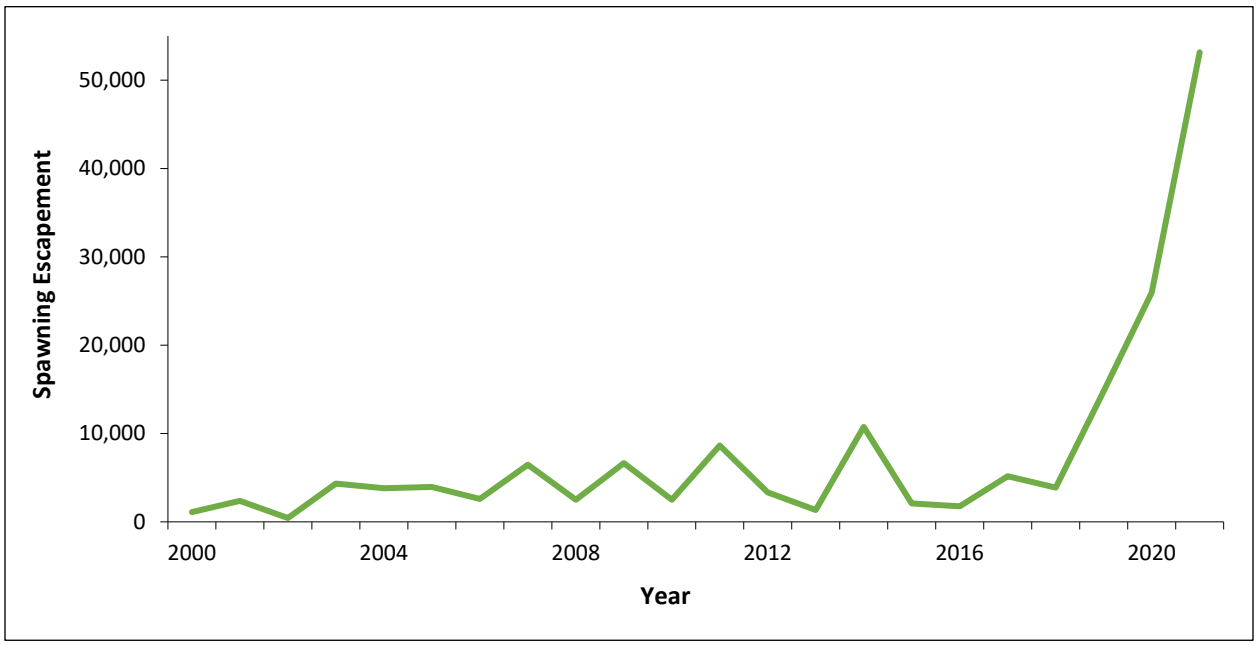
Since initiation of the reintroduction program, annual counts of returning Coho Salmon adults at Rock Island Dam have strongly fluctuated but have displayed an increasing trend with a very large run in 2021 (Figure 5.3-13). Spawning abundance in the Wenatchee and Methow subbasins

combined have followed a similar trend, with very large spawning escapement in 2021 (Figure 5.3-14). In both the Wenatchee and Methow subbasins, greater than 95 percent of adult returns originate from hatchery production (YNF 2022).



Source: DART 2023a

Figure 5.3-13 Rock Island Dam Coho Salmon Counts, 1989 to 2022



Source: YNF 2022

Figure 5.3-14 Upper Columbia Coho Salmon Spawning Escapement, 2000 to 2021

Essential Fish Habitat

EFH has been defined for Coho Salmon as: 1) spawning and incubation; 2) juvenile rearing; 3) juvenile migration corridors; and 4) adult migration corridors and holding habitat (PFMC 2014). EFH includes all habitat currently or historically occupied by Coho Salmon. The Project is within the USGS HUC 1702001002 and HUC 1702001003 (Columbia River) and HUC 1702001105 (Lower Wenatchee River Watershed), which contains juvenile migration corridor, adult migration corridor, and holding EFH.

Management

The Yakama Nation has led Coho Salmon reintroduction efforts in the Wenatchee and Methow subbasins through the MCCRP (YNFRM 2017). The USFWS has provided hatchery facilities and other support to assist with implementation of the MCCRP and Chelan, Douglas, and Grant PUDs provide funding for the MCCRP in the Wenatchee and Methow subbasins.

Fisheries

UCR Coho Salmon are harvested both in the ocean and Columbia River fisheries (Maier 2020). Treaty and non-treaty fisheries are managed to provide each 50 percent of the harvest of adult Coho Salmon that are available for harvest (Joint Columbia River Management Staff 2022). Harvest on upriver early Coho Salmon, primarily fish from the Yakima subbasin, averaged 20 percent in ocean fisheries and 15 percent in mainstem Columbia River fisheries. For hatchery-origin Coho Salmon, 30 percent of escapement was harvested in ocean fisheries and 20 percent in Columbia River fisheries (data through 2001; Berg and Fast 2001). Non-selective tribal fisheries and selective sport harvest for Coho Salmon occur in the lower Columbia River. Returns from the Wenatchee and Methow programs now contribute between 30 and 40 percent of the Coho Salmon harvest in the tribal fishery between Bonneville and McNary dams (Harrison 2022). Fisheries have been conducted in 5 years since 2011 on returns from the Wenatchee and Methow program when runs are abundant (Table 5.3-15).

Table 5.3-15 Coho Salmon Fisheries in the Upper Columbia River

YEAR[1]	LOCATION	RETAINED	RELEASED
2011	Wenatchee subbasin	111	161
	Methow subbasin	78	-
2019	Icicle Creek (Wenatchee subbasin)	59	140
2020	UCR and tributaries	175	69
2021	UCR and tributaries	871	936

Sources: Fortier 2022; Maitland 2020 and 2021; Tonseth et al. 2012
[1]2022 data are not available yet.

Habitat Conservation Plan Implementation

The Rock Island HCP's Passage Survival Plan requires Chelan PUD to achieve 91 percent Combined Adult and Juvenile Project Survival or 93 percent Juvenile Project Survival standards for yearling Coho Salmon migrants. Because Coho Salmon were extirpated when the HCPs were implemented, opportunities to conduct valid survival studies did not exist. Chelan PUD's compliance with the Passage Survival Plan therefore required interim steps to meet the Phase III standard (Table 5.3-16).

Table 5.3-16 Summary of Phase Designations and Project Survival at Rock Island by Yearling Coho Salmon including Survival Standard and Date Achieved

SURVIVAL STUDY PERIOD	JUVENILE PROJECT SURVIVAL (PERCENT)	ROCK ISLAND COHO SALMON PHASE DESIGNATION
2007-2017	93.00[1]	Phase III Standard Achieved – Interim Value (June 26, 2007)
2017	93.98	Phase III Standard Achieved (Mar. 30, 2017)

Source: Chelan PUD 2018 and 2023a; Chelan PUD and Anchor QEA 2021
[1]Interim project survival.

The HCP includes steps that Chelan PUD took to demonstrate NNI for prior to establishment of a hatchery program or a naturally reproducing population of Coho Salmon as well as once a population was successfully established. In June 2007, the HCP Coordinating Committee agreed to provide a Coho Salmon hatchery compensation program as contemplated in the HCP by applying the interim value of juvenile project survival value of 93 percent. Accordingly, Chelan PUD began funding a Coho Salmon reintroduction program with the Yakama Nation. To further examine the survival of Coho Salmon a surrogate analysis between Coho Salmon and other spring-migrating Plan Species was conducted using PIT-tag data from 2010 to 2016, as well as previous acoustic tag survival study results. Results demonstrated that juvenile Coho Salmon survived hydropower system passage similar to yearling Chinook Salmon, and in March 2017, the HCP Coordinating Committee utilized the results of Chelan PUD's yearling Chinook Salmon acoustic-tagged survival estimates and PIT-tag-based estimates as a surrogate, moving Coho Salmon to Phase III Standards Achieved (Chelan PUD 2023a).

Current Coho Salmon hatchery compensation levels for the Rock Island and Rocky Reach HCPs are provided in Table 5.3-17 (Chelan PUD 2022).

Table 5.3-17 Chelan PUD Habitat Conservation Plan Coho Salmon Production Targets for Rock Island and Rocky Reach Dams

PROJECT	INITIAL PRODUCTION (THROUGH 2013)	RECALCULATED PRODUCTION (2014-2023)	RECALCULATED PRODUCTION (2024-2033)	REARING LOCATION
Rock Island	NA	Funding Agreement[1]	125,309	MCCRP
Rocky Reach	NA		59,463	

Source: Chelan PUD and Anchor QEA 2019; Chelan PUD 2023a

[1]Coho Salmon mitigation obligation fulfilled through funding agreement with the Yakama Nation in 2018 to support creation of the infrastructure for hatchery programs.

These programs include the MCCRP and the Wells Hatchery Coho Salmon Program, which produce fish for release in the Wenatchee and Methow subbasins. Table 5.3-18 provides the current program sizes and locations for the Coho Salmon hatchery programs in the UCR.

As part of hatchery compensation funding for Coho Salmon, Chelan PUD also funds a portion of the MCCRP monitoring and evaluation activities (Chelan PUD 2018). The MCCRP monitoring and evaluation program is operated by Yakama Nation Fisheries (YNF) under the Mid-Columbia Coho Restoration Master Plan (YNFRM 2017). An annual report is produced each year summarizing monitoring and evaluation activities and data collection by YNF (YNF 2022).

Table 5.3-18 Coho Salmon Hatchery Programs in the Upper Columbia River

HATCHERY	PROGRAM	HATCHERY OWNER(S)	FUNDING SOURCE	SUBBASIN	RELEASE LOCATION	PROGRAM SIZE
Leavenworth National Fish Hatchery (NFH), Willard NFH, Eagle Creek NFH, and Cascade Fish Hatchery	Mid-Columbia Coho Reintroduction Program	USFWS and ODFW	Chelan PUD, Grant PUD, Bonneville Power Administration	Wenatchee	Beaver Creek Rohlfing's Pond Butcher Creek Coulter Creek Powerline Pond Leavenworth NFH	1,000,000[1]
Winthrop NFH	Mid-Columbia Coho Reintroduction Program	USFWS	Chelan PUD, Grant PUD, Bonneville Power Administration	Methow	Mid-Valley Pond Early Winters Ponds Twisp Weir Pond Chewuch Acclimation Facility Eightmile Pond Lower Twisp Ponds Winthrop NFH	700,000[2]
Wells Hatchery	Mid-Columbia Coho Reintroduction Program	Douglas PUD	Douglas PUD	Methow	Methow River	27,909

Source: Douglas PUD 2022; YNFRM 2017
[1]Program is in the Broodstock Development Phase (YNFRM 2017)
[2]Program is in the Natural Production Implementation Phase (YNFRM 2017)

In addition to Passage Survival and Hatchery Compensation Plans, Chelan PUD also funds projects for the protection and restoration of tributary habitat for Coho Salmon through implementation of the Rock Island HCPs' Tributary Conservation Plan. See Table 5.3-7 for information on the Chelan PUD Tributary Fund.

5.3.6.5 Sockeye Salmon

Sockeye Salmon are a widely distributed, semelparous, and primarily anadromous species in the genus *Oncorhynchus*. The species (inclusive of the freshwater resident kokanee [*Oncorhynchus nerka*]) ranges from Oregon to Alaska and into eastern Russia. The construction of Grand Coulee Dam blocked all anadromous fish passage above Columbia River RM 596.6 after 1938, causing the extirpation of upstream Sockeye Salmon populations.

Life History

The Okanogan River Sockeye Salmon (Okanogan Sockeye) ESU includes populations that spawn in areas upstream of Lake Osoyoos and in Lake Osoyoos. Sockeye Salmon are also observed in the Similkameen River (below Enloe Dam), but their origins are uncertain. While primary spawning and rearing areas for the Okanogan Sockeye ESU are in British Columbia, Canada, the adult and juvenile migration corridor comprises the Columbia River (Gustafson et al. 1997). The Lake Wenatchee Sockeye Salmon (Wenatchee Sockeye) ESU includes all naturally spawning populations that spawn upstream of, or in, Lake Wenatchee, and rear in Lake Wenatchee. Like Okanogan Sockeye, Wenatchee Sockeye use the Columbia River as an adult and juvenile migration corridor (Gustafson et al. 1997).

Relative to other Pacific salmon species, Sockeye Salmon exhibit particularly diverse life-history patterns: fish typically spend 1 to 3 years in freshwater lakes and 1 to 4 years at sea (Groot and Margolis 1991). In the UCR, Okanogan Sockeye predominantly spend 1 or 2 years at sea before returning to spawn, while Wenatchee Sockeye predominantly spend 2 or 3 years at sea (Gustafson et al. 1997). Sockeye Salmon occupy Lake Wenatchee in the Wenatchee subbasin and in the Osoyoos, Skaha, and Okanagan lakes in the Okanogan[37] subbasin.

Adult Sockeye Salmon return to the Columbia River from the ocean between May and July and enter subbasin tributaries starting in June (Hillman et al. 2022; Murauskas et al. 2021). Homing to their natal tributary is accomplished through olfactory imprinting, which is thought to be more precise than that of other Pacific salmon species (Quinn 2005). Adults tend to migrate upstream

[37] Spelling is "Okanogan" in the United States and "Okanagan" in Canada.

in schools, conserving energy by navigating stream margins, eddies, and the bottom of the streambed where currents are slower (Groot and Margolis 1991). Adults migrating to the Okanogan subbasin are often delayed by warm water temperatures in the lower Okanogan River in July, August, and into September (Murauskas et al. 2021; Gustafson et al. 1997). Spawning takes place in the Okanogan River upstream of Lake Osoyoos between mid-September and October and in tributaries to Lake Wenatchee between late-September and October. Some spawning has also been observed on the shores of Lake Wenatchee and Lake Osoyoos (Gustafson et al. 1997). Sockeye Salmon spawn in diverse habitats, including tributary headwaters, spring-fed ponds and side channels, rivers upstream or downstream of lakes, and submerged areas of lake beaches. Spawning females build redds in gravel, and redd depth can vary considerably depending on whether spawning occurs in rivers (shallower) or lakes (deeper) (Groot and Margolis 1991). Eggs incubate in the gravel throughout winter, and fry emerge between March and May (Gustafson et al. 1997).

Unique amongst Pacific salmon, the juvenile stage of Sockeye Salmon is commonly—though not exclusively—reliant on lake rearing habitats (Groot and Margolis 1991). Following emergence, juveniles typically disperse downstream to rear in Lake Osoyoos, Skaha Lake, and Lake Wenatchee, respectively (Gustafson et al. 1997). Young fry occupy lakeshore littoral zones and move into progressively deeper waters as they grow. In the limnetic zone, fry tend to exhibit a diel migration pattern, whereby they occupy deeper waters during the day and migrate to surface waters at night, where they feed on increasingly large and energy-rich zooplankton (Quinn 2018).

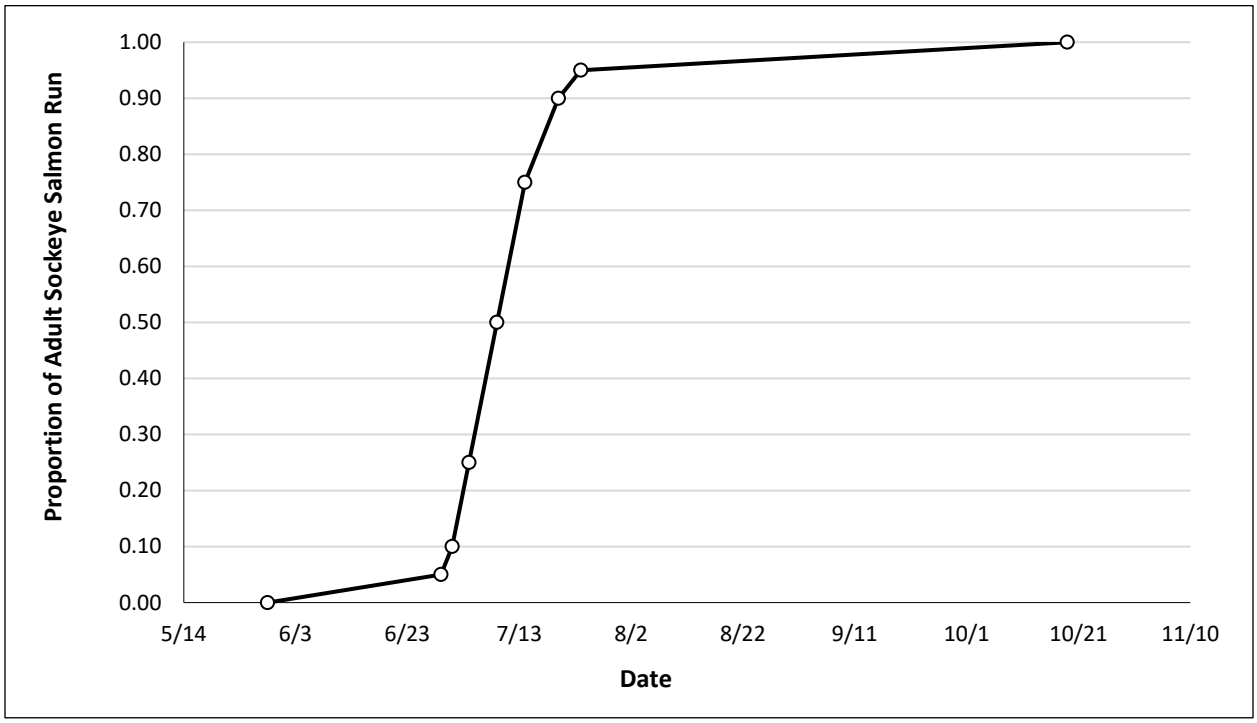
Most Sockeye Salmon initiate their seaward migration in April and May, coincident with lengthening photoperiod, increasing water temperatures, and breakup of winter ice cover (Groot and Margolis 1991). Okanogan Sockeye begin the smoltification process as yearlings, while Wenatchee Sockeye may smolt after either 1 or 2 years in freshwater (Gustafson et al. 1997). Sockeye Salmon smolts tend to exit lakes in schools, migrating at night and swimming actively downstream. Following lake exit, the migratory corridor consists of the mainstems of subbasin tributaries and the Columbia River. Smolts are characterized by less distinct parr marks, silvery coloration with counter-shading, and a slimmer, more streamlined body shape and are physiologically capable of osmoregulation in freshwater (Groot and Margolis 1991). Upon entering the Columbia River estuary, smolts complete the physiological transition to saltwater and move relatively quickly to marine waters (Quinn 2018).

Upon ocean entry, Sockeye Salmon may linger in nearshore habitats in the spring and summer following outmigration, but typically move into offshore waters thereafter. Sockeye Salmon exhibit a northward migration pattern, with most reaching the Gulf of Alaska by their first winter at sea (Quinn 2018). Survival and growth in the ocean are strongly influenced by a complex interaction

of sea surface temperatures, upwelling, currents, predators, and food supply (Quinn 2005). Sockeye Salmon may achieve 99 percent or more of their lifetime growth at sea (Quinn 2018).

Adult Migration through the Rock Island Project

Upstream passage of Sockeye Salmon occurs at the Rock Island Adult Fishways between May and October with the majority of fish passing between June and July (Figure 5.3-15) (DART 2023a). Most fish bound for the Wenatchee subbasin enter the river by July. Counts at Tumwater Dam, located at RM 27 on the Wenatchee River, indicate that peak movement upstream in the Wenatchee subbasin is in late July and most of the run has passed Tumwater Dam by early August (Hillman et al. 2022).



Source: DART 2023a

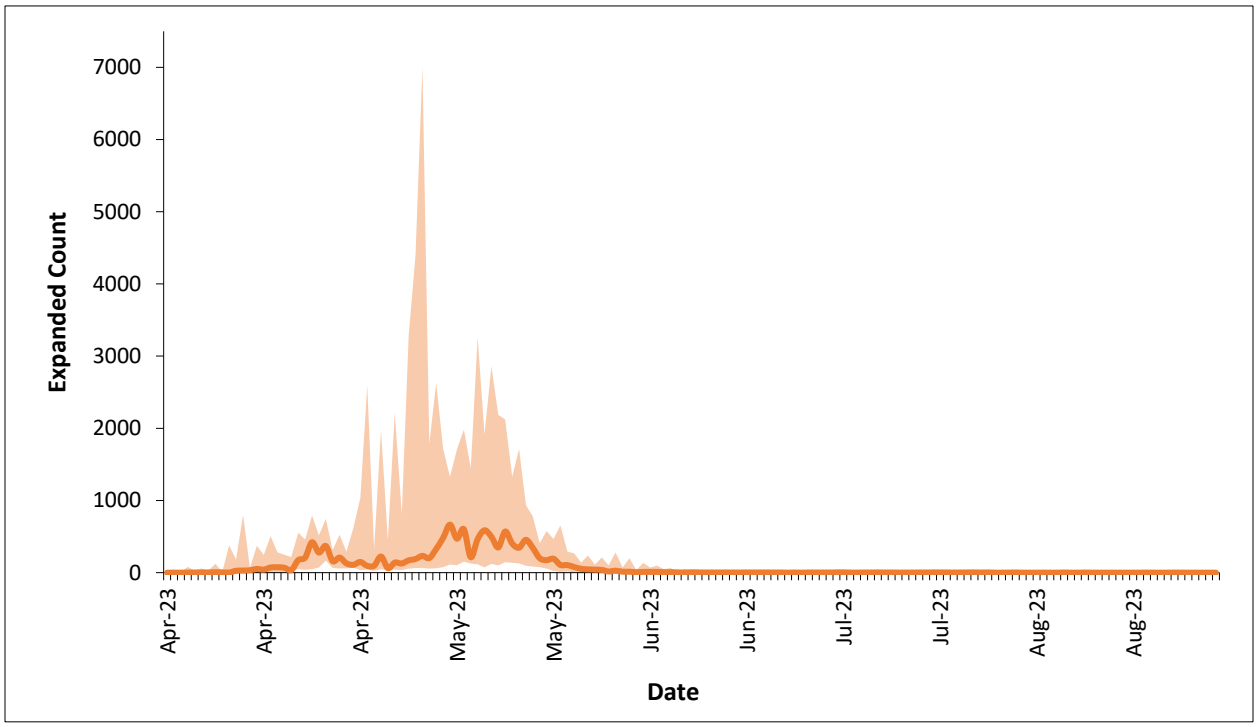
Figure 5.3-15 Cumulative Seasonal Run Timing for Sockeye Salmon at Rock Island Adult Fishways During the Period of 2002 to 2022

Adult Conversion Rate

Among Sockeye Salmon known to originate from tributaries upstream of the Rock Island Project, the average annual conversion rate of migrating adults between Rock Island Dam and Rocky Reach Dam, even considering harvest that occurs within the Rock Island Project, is 98.1 percent based on available PIT-tag data from 2013-2022 (DART 2023b).

Smolt Migration Through the Rock Island Project

Sockeye Salmon smolts migrate downstream past the project during the months of April to June with the majority passing in late April and May (Figure 5.3-16) (DART 2023a). Sockeye Salmon smolts use the Rock Island Project as a migratory corridor as rearing typically occurs within subbasin lakes (Table 5.3-19).



Source: Chelan PUD 2023b

Figure 5.3-16 Rock Island Juvenile Bypass Juvenile Sockeye Salmon Expanded Counts, Median with 95% Confidence Intervals, 2010 to 2022

Table 5.3-19 Sockeye Salmon Use of the Rock Island Project

LIFE HISTORY STAGE	TIMING	HABITAT USE	DESCRIPTION
Adult	June to July	Migration Corridor	Returning adults use the Columbia River as a migration corridor.
Incubation	NA	None	Spawning and incubation take place in subbasin tributaries.
Juvenile	NA	None	Juvenile rearing takes place in subbasin lakes and tributaries.
Smolt	April to June	Migration Corridor	Smolts use the Columbia River as a migration corridor.

Sources: DART 2023a; Gustafson et al. 1997

Status

Endangered Species Act Consultation Record

UCR Sockeye Salmon, including both the Okanogan River and Lake Wenatchee Sockeye Salmon ESUs, are not listed under the ESA,[38] but are considered a Plan Species under the HCP and are included in the Section 10 Incidental Take Permit. The most recent status review of the Okanogan River Sockeye Salmon ESU and Lake Wenatchee Sockeye Salmon ESU (Gustafson et al. 1997) concluded that both ESUs were not presently in danger of extinction nor were likely to become endangered in the foreseeable future. Because these ESUs are not listed under the ESA, critical habitat has not been designated for the Okanogan River or Lake Wenatchee sockeye salmon ESUs.

In 2003, as part of its Section 7 BiOp on issuance of the Section 10 Incidental Take Permit for Rock Island, NMFS included an analysis of potential impacts to Okanogan River and Lake Wenatchee sockeye salmon from operation of the Rock Island Project and implementation of the HCP. This analysis for unlisted Sockeye Salmon was included in NMFS's BiOp on its issuance of the Incidental Take Permit (NMFS 2003a and 2003b). NMFS concluded that the proposed permits would not jeopardize the continued existence of Okanogan River and Lake Wenatchee Sockeye Salmon (Table 5.3-20).

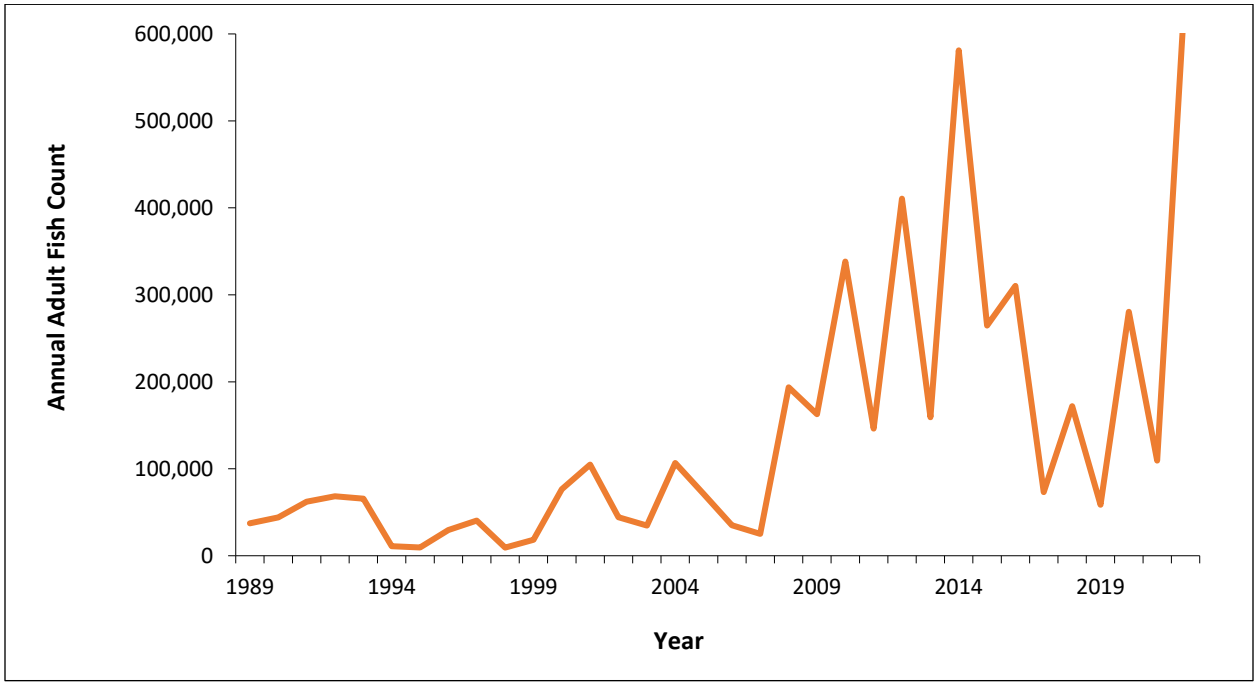
Table 5.3-20 Endangered Species Act and Management Documents Related to Sockeye Salmon in the Upper Columbia River

DOCUMENT	DATE	AUTHOR	DESCRIPTION
BiOp, Unlisted Species Analysis, and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Chelan County for the Rock Island Hydroelectric Project (FERC No. 943) Anadromous Fish Agreement and Habitat Conservation Plan and Construction of a Small Turbine Unit in the Attraction Water Conduit of the Left Bank Adult Fishway	2003a	NMFS	"No jeopardy" unlisted species analysis for issuance of Incidental Take Permit for Rock Island Anadromous Fish Agreement and HCP
Permit for Incidental Take of Endangered/Threatened Species. Permit No. 1393.	2003b	NMFS	Section 10 ESA permit issued to Chelan PUD

[38] https://www.fisheries.noaa.gov/species/sockeye-salmon-protected#overview.

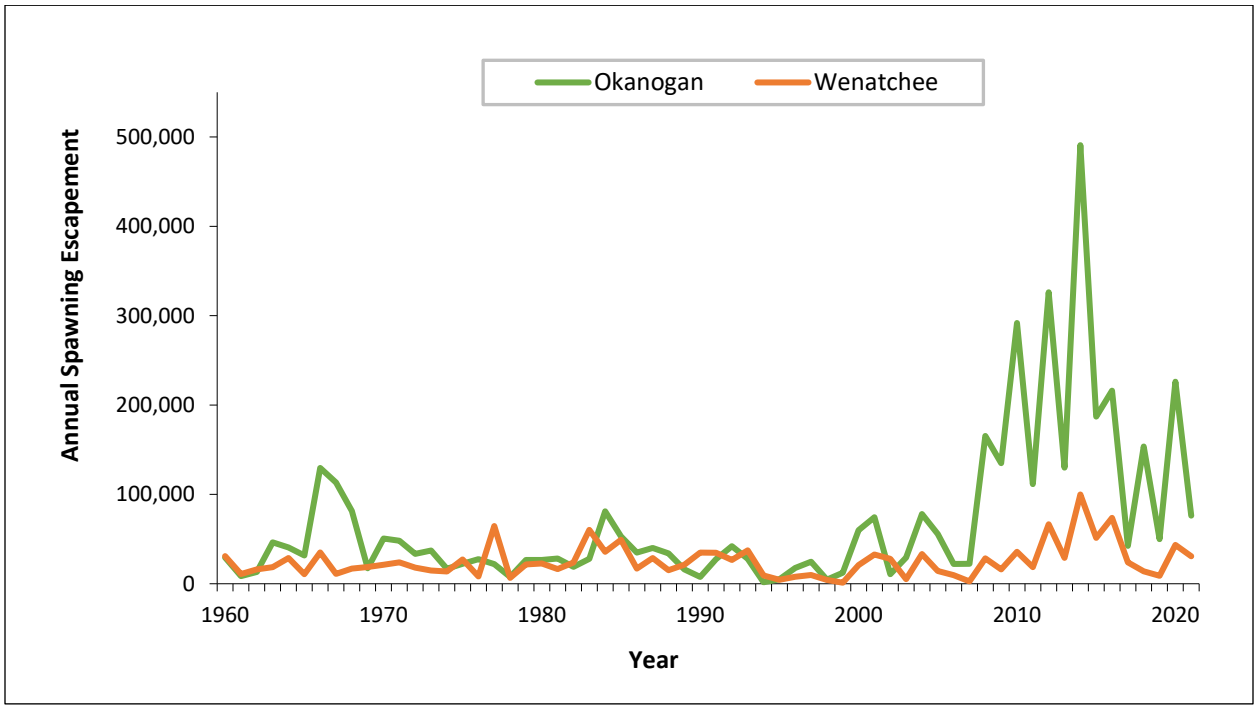
Population Trends

The number of Sockeye Salmon counted annually at the Rock Island Adult Fishways has shown considerable variability over past decades but has increased dramatically since approximately 2008 (Figure 5.3-17). Most recently in 2022, over 650,000 Sockeye Salmon were enumerated at the Rock Island Adult Fishways, representing the highest count recorded at the Rock Island Project (DART 2023c). The numbers observed at the Rock Island Adult Fishway reflect adult returns from both the Okanogan and Wenatchee subbasins prior to prespawning mortality or upstream harvest. Spawner escapement, which reflects the actual number of fish that have survived fisheries and other sources of mortality to spawn, have also shown dramatic increases in recent years (Figure 5.3-18). During the past decade in which spawner escapement data are available (2012 to 2021; Figure 5.3-18), escapement to the Okanogan and Wenatchee subbasins has averaged 189,816 and 44,145 fish, respectively. These values represent a quadrupling and doubling of the average spawner escapement for the Okanogan and Wenatchee subbasins, respectively, compared to the 52 years prior (1960 to 2011; Figure 5.3-18).



Source: DART 2023c

Figure 5.3-17 Rock Island Dam Adult Sockeye Salmon Counts, 1989 to 2022



Source: WDFW 2023b

Figure 5.3-18 Upper Columbia Sockeye Salmon Spawning Escapement, 1960 to 2021

The drivers for the recent abundance increase in the Okanogan subbasin include parallel habitat improvement and reintroduction efforts occurring within the Canadian portion of the Okanogan Subbasin (Truscott et al. 2022). Specifically, the increases in the Okanogan Sockeye Salmon population were observed after the first releases of hatchery Sockeye Salmon for the reintroduction program in 2005; utilization of the Fish and Water Management Tool (FWMT) [39] beginning in 2008; implementation of habitat improvement projects; removal of fish passage barriers in Canada; and the releases of hatchery fry from the kł cp̓əlḱ stiḿ (Penticton) Hatchery beginning in 2015 (Truscott et al. 2022). For both the Wenatchee and Okanogan subbasins, ocean conditions are also an important contributor to abundance trends (Williams et al. 2014).

Despite recent increases in abundance, Sockeye Salmon in the mainstem Columbia River and Okanogan River habitats have been negatively affected by warming water temperatures associated with climate change (Stockwell et al. 2020; Truscott et al. 2022). In 2015, the combined effects of high mainstem and Okanogan River water temperatures contributed to the loss of approximately 97 percent of the returning adults prior to spawning (Figure 5.3-17) (Truscott et al. 2022). The occurrence of high-water temperatures in the Okanogan River frequently creates a

[39] https://www.syilx.org/projects/fish-water-management-tool-emergence-sampling/.

temperature barrier that has delayed Sockeye Salmon from entering the tributary from the mainstem Columbia River for 40 to 60 days (Truscott et al. 2022).

Essential Fish Habitat

EFH has not been defined for Sockeye Salmon (PFMC 2014). Sockeye Salmon stocks originating outside of Puget Sound are not federally managed, and thus do not have EFH established.[40]

Management

Chelan PUD, Douglas PUD, and Grant PUD have supported management of Sockeye Salmon through funding habitat enhancement and reintroduction projects such as the kł cp̓əlḱ stiḿ Hatchery, the FWMT, and associated ecological studies that were essential for Sockeye Salmon reintroduction efforts in Skaha and Okanagan lakes. Additionally, Chelan PUD funds and conducts monitoring and evaluation activities for the Lake Wenatchee Sockeye population.

The Okanagan Nation Alliance (ONA) was instrumental in reintroducing Sockeye Salmon to large areas of blocked habitat in the upper Okanogan River Basin including Skaha and Okanagan lakes. In the 1990s these entities collaborated to develop an experimental reintroduction strategy, and in 2004 an experimental reintroduction project was launched (Skaha and Okanagan Lakes Sockeye Salmon Reintroduction Program; Truscott et al. 2022). Chelan PUD and Grant PUD provided funding for the project with early work focusing on interactions between existing resident species and reintroduced Sockeye Salmon to address habitat capacity and fish health concerns. These studies required experimental releases of large numbers of juvenile Sockeye Salmon in Skaha Lake. The kł cp̓əlḱ stiḿ Hatchery was constructed (with the first release of fry in 2014) to provide sufficient numbers of fry for this purpose (ONA 2023). Based on positive results from these studies, the reintroduction effort moved forward resulting in continued reintroductions of Sockeye Salmon fry into Skaha Lake and eventually Okanagan Lake, and the removal of adult passage barriers below Skaha and Okanagan lakes in 2009 and 2019, respectively. Chelan PUD and Grant PUD provided funding for the design and construction of kł cp̓əlḱ stiḿ Hatchery and associated operational, maintenance, and monitoring and evaluation costs. Both PUDs continue to fund the successful reintroduction program. To date, Skaha Lake has seen record returns in 2020 (25,600) and 2022 (39,000) and full Sockeye Salmon passage into Okanagan Lake was approved in 2022 (Truscott et al. 2022).

Additionally, the FWMT was developed by the ONA, Department of Fisheries and Oceans Canada, British Columbia Ministry of Forests, Lands and Natural Resource Operations and Rural

[40] https://www.pcouncil.org/fact-sheet-habitat-and-essential-fish-habitat/.

Development, and Douglas PUD to improve water management in the Canadian Okanagan Basin and has contributed to the success of the Okanagan Sockeye Salmon Reintroduction Program (Hyatt et al. 2015). The FWMT is a web-based computer model that guides Canadian water and fish managers to fish-friendly decisions on water releases from dams in the Canadian Okanagan. Implementation of the FWMT and habitat restoration activities have increased habitat productivity for the Okanagan Sockeye Salmon Reintroduction Program.

Fisheries

Nearly all the harvest on hatchery-origin and natural-origin UCR Sockeye Salmon occurs within the Columbia River Basin (Hillman et al. 2022). Tribal fisheries and selective sport harvest for Sockeye Salmon has occurred in the lower and UCR and Wenatchee and Okanogan subbasins. Harvest in the Wenatchee subbasin is conducted when run sizes are large enough to achieve escapement goals set by co-managers. Harvest on species in Columbia River commercial, recreational, and treaty fisheries are managed under the 2018-2027 United States v. Oregon Management Agreement (NMFS 2018). Harvest of the Wenatchee stock for brood years 1989-2015 averaged 4,988 (range 84 to 21,482; Hillman et al. 2022). An average of 19 percent of Okanagan Sockeye are harvested between Wells Dam and spawning grounds each year, often when fish are congregated in the Columbia River downstream of the Okanogan River thermal barrier (Murauskas et al. 2021).

Habitat Conservation Plan Implementation

The Rock Island HCP's Passage Survival Plan requires Chelan PUD to achieve 91 percent Combined Adult and Juvenile Project Survival or 93 percent Juvenile Project Survival. Chelan PUD has conducted 9 years of valid survival studies with juvenile Sockeye Salmon at the Rock Island Project between 2003 and 2012, achieving the Phase III standard at both 20 percent and 10 percent spring spill levels (Chelan PUD 2023a). Most recently, Chelan PUD achieved 93.27 percent Juvenile Project Survival at 10 percent spring spill and Adult Project Survival of 98.37 percent for a Combined Juvenile and Adult Project Survival of 91.75 percent and attainment of the Phase III designation (Table 5.3-21) (Chelan PUD and Anchor QEA 2021; Chelan PUD 2023a).

Table 5.3-21 Summary of Current Phase Designation and Project Survival at Rock Island by Yearling Sockeye Salmon including Survival Standard and Date Achieved

SURVIVAL STUDY PERIOD	JUVENILE PROJECT SURVIVAL (PERCENT)	ADULT PROJECT SURVIVAL (PERCENT)	COMBINED JUVENILE AND ADULT PROJECT SURVIVAL (PERCENT)	ROCK ISLAND SOCKEYE SALMON PHASE DESIGNATION
2002-2013	93.27	98.37	91.75	Phase III Standard Achieved

Sources: Chelan PUD 2023a; Chelan PUD and Anchor QEA 2021

Current Sockeye Salmon hatchery compensation for the Rock Island and Rocky Reach HCP includes funding a portion of the Skaha and Okanagan Lakes Sockeye Salmon Reintroduction Program, which includes operational, and monitoring and evaluation costs associated with hatchery production from the kł cp̓əlḱ stiḿ Hatchery (Table 5.3-22). The total annual production target for the kł cp̓əlḱ stiḿ Hatchery is up to 5 million eggs. Since 2015, over 17 million Sockeye Salmon fry have been released in Skaha and Okanagan lakes and have provided the foundational information necessary to support the reintroduction efforts in both lakes.

In addition to funding the Skaha and Okanagan Lakes Sockeye Salmon Reintroduction Program, the HCP Hatchery Committee approved a species trade agreement during the first hatchery recalculation period (2014-2023) for Lake Wenatchee Sockeye Salmon. During the first hatchery recalculation period, the calculated Lake Wenatchee Salmon production value was small (i.e., 46,000 smolts) due to a mean smolt-to-adult return rate of 0.0123 for 2000 to 2005; an average escapement of 13,851 adults for 2003-2010; and measured unavoidable project mortality at Rock Island of 6.73 percent. Thus, Chelan PUD produced steelhead during the first hatchery recalculation implementation period (2014 to 2023) and spring and summer/fall Chinook Salmon during the 2024 to 2033 hatchery recalculation implementation periods in lieu of Sockeye Salmon (Table 5.3-22).

Table 5.3-22 Chelan PUD Habitat Conservation Plan No Net Impact Sockeye Salmon Production Targets for Rock Island and Rocky Reach Dams

PROJECT	INITIAL PRODUCTION (THROUGH 2013)	RECALCULATED PRODUCTION (2014-2023)	RECALCULATED PRODUCTION (2024-2033)	REARING LOCATION
Rock Island	200,000	Funding and Conducting Monitoring and Evaluation Program Activities[1]	Funding and Conducting Monitoring and Evaluation Program Activities[2,3,4]	Lake Wenatchee
Rock Island and Rocky Reach	Funding Okanogan Reintroduction Program	Funding Okanogan Reintroduction Program	Funding Okanogan Reintroduction Program	kł cp̓əlḱ stiḿ Hatchery

Source: Chelan PUD 2023a

[1]Recalculated Sockeye Salmon production in Lake Wenatchee (46,000) was traded for 60,300 steelhead.

[2]Includes species trade of 22,911 of the 43,652 recalculated Sockeye Salmon production plus 121,089 Chiwawa spring Chinook No Net Impact (NNI) production = 144,000 Chiwawa spring Chinook.

[3]Includes species trade of 1,961 of the 43,652 recalculated Sockeye Salmon production plus 133,322 Chelan Falls summer Chinook NNI production = 135,283 Chelan Falls summer Chinook.

[4]Includes species trade of 18,780 of the 43,652 recalculated Sockeye Salmon production plus 274,996 Dryden summer Chinook NNI production = 293,776 Dryden summer Chinook.

Although Sockeye Salmon production in the Wenatchee subbasin has ceased, Chelan PUD continues to fund monitoring and evaluation activities focused on the natural-origin Wenatchee Sockeye population. The activities include smolt trapping, spawner escapement estimates, adult counts at Rock Island and Tumwater dam adult fishways, and related analyses to document population trends. The implementation of Chelan PUD's hatchery monitoring and evaluation program is described in Section 4.3.

In addition to Passage Survival and Hatchery Compensation Plans, Chelan PUD also funds projects for the protection and restoration of tributary habitat improvements for UCR Sockeye Salmon through implementation of the Rock Island HCP's Tributary Plan. See Table 5.3-7 for information on the Chelan PUD Tributary Fund.

5.3.6.6 Upper Columbia River Summer Steelhead

Steelhead are a widely distributed, anadromous, and iteroparous species in the genus *Oncorhynchus*. They are found from southern California to southern Alaska and Asia, while the species (*O. mykiss*, inclusive of freshwater resident Rainbow Trout) ranges from northern Mexico to northern Alaska and Asia (Quinn 2018; Light et al. 1989). The UCR steelhead DPS includes four populations: the Okanogan, Methow, Entiat, and Wenatchee. Steelhead hatchery programs within this region are also included in the UCR steelhead DPS.

Life History

Steelhead exhibit a wide range of life-history diversity with individuals spending 1 to 3 years in freshwater, 1 to 3 years at sea, and potentially spawning multiple times. UCR steelhead typically return from the ocean between May and September to spawn after spending 1 to 2 years at sea (NMFS 2003c). Returning steelhead enter subbasin tributaries in the fall, or overwinter in mainstem reservoirs, and enter Columbia River tributaries to spawn between March to June of the year following river entry (Peven 1992; Robards and Quinn 2002). Homing to their natal stream is accomplished through olfactory imprinting (Quinn 2005). Female steelhead site redds in well-oxygenated gravels relatively free of fine sediments (Bjornn and Reiser 1991). Relative to other salmonid species, summer steelhead migrate further upstream into tributary headwaters to spawn. As such, steelhead redds tend to be sited in faster water than those of other salmonids and in coarser gravels (Quinn 2018). After spawning, a minority of steelhead spawners ("kelts," less than 10 percent) attempt to return to the ocean and spawn again, a disproportionate number of which are females and natural-origin fish (Keefer et al. 2008). Eggs incubate in the stream substrate and fry emerge in late spring or early summer (Quinn 2018).

Following emergence, juvenile steelhead typically rear in tributaries for 1 to 3 years, although some have been documented rearing for up to 7 years prior to seaward migration (Peven 1990).

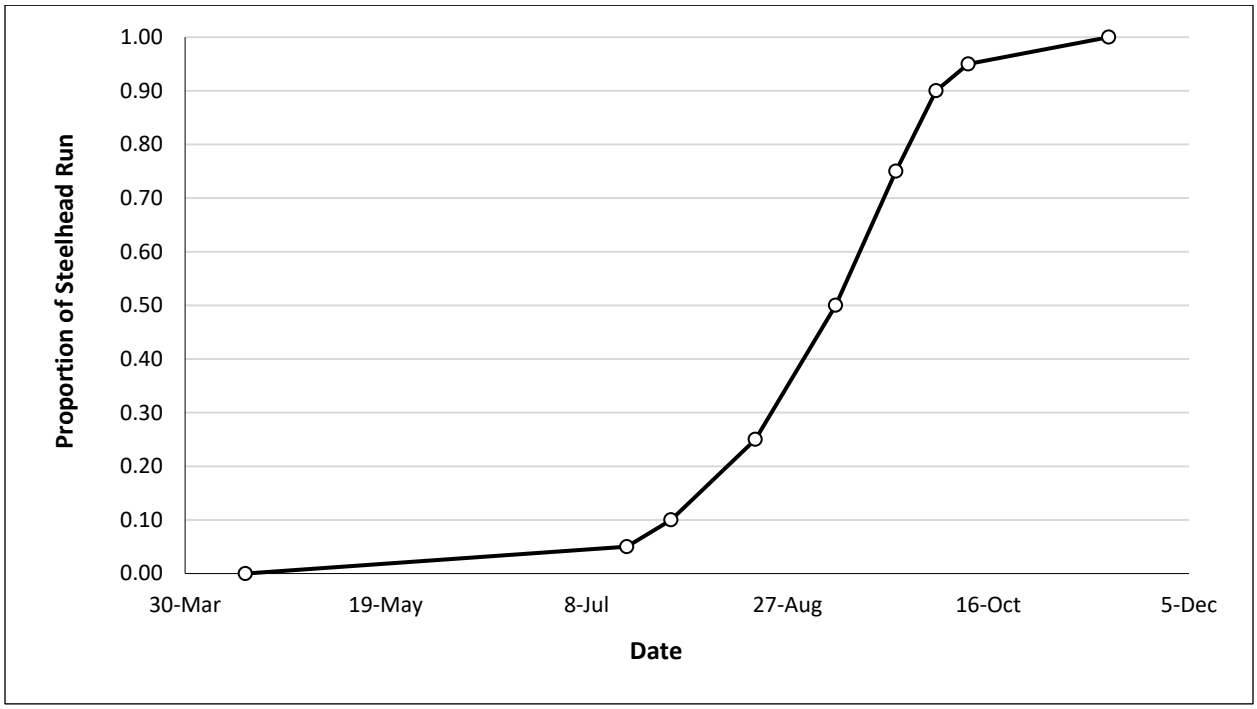
Steelhead fry can be found in a variety of habitats, including pools and riffles. Relative to other juvenile salmonids, juvenile steelhead can occupy steeper, shallower, and higher-velocity areas of tributary streams. As fry transition to the parr stage, they shift to deeper, swifter water where drifting invertebrate prey are common (Bisson et al. 1988). Juveniles may seek refuge from predators by hiding in interstitial spaces between rocks or near large woody debris and overhanging vegetation (NMFS 2019). A proportion of the juveniles tend to shift to overwinter habitat by moving downstream in the fall (Hillman et al. 2022; Snow et al. 2022). Notably, some juvenile steelhead may residualize in freshwater tributaries and subsequently lose the ability to smolt; thereafter, these fish are considered resident Rainbow Trout (UCSRB 2007). In the Columbia River, most steelhead parr begin the physiological transformation to the smolt phase as 2- or 3-year-old fish (Busby et al. 1996).

Smolts initiate their downstream migration between April and June in response to lengthening photoperiod, increasing flow, and increasing water temperature (Bjornn and Reiser 1991). The migratory corridor consists of the mainstems of subbasin tributaries and the Columbia River. Upon entering the Columbia River estuary, smolts complete the physiological transition to saltwater and move relatively quickly through the estuary, gaining speed as they move into coastal waters (McMichael et al. 2013; Quinn 2018).

After entering the ocean, steelhead tend to move rapidly offshore, where they benefit from abundant prey and faster growth relative to that in estuaries (Miller et al. 1983; Daly et al. 2014). Broadly, survival and growth in the ocean are influenced by a complex interaction of sea surface temperatures, upwelling, currents, predators, and food supply (Quinn 2005). Most steelhead eventually migrate into the Gulf of Alaska or the waters south of the Aleutian Islands (Light et al. 1989), where they may achieve 98 percent or more of their lifetime growth (Quinn 2018).

Adult Migration through the Rock Island Project

Upstream steelhead passage at the Rock Island Adult Fishways typically occurs throughout the year, with the majority of fish passing between August and October (Figure 5.3-19) (DART 2023a). The fish move upstream of the dam and disperse through the UCR DPS area to their natal tributaries. Kelts migrate downstream after spawning in spring to early summer. Adults or kelts occupy the Rock Island Project nearly year-round (Table 5.3-23). Mean travel time from Rock Island Dam to Rocky Reach Dam is 1.63 days (DART 2023d). Adult steelhead display a bimodal migration in the Wenatchee subbasin, with a summer/autumn pulse and a late winter/spring pulse (Hillman et al. 2022). Counts at Tumwater Dam, located at RM 27 on the Wenatchee River, indicate that peak upstream movement periods in the Wenatchee subbasin occur in mid-October and mid-April (Hillman et al. 2022).



Source: DART 2023a

Figure 5.3-19 Cumulative Seasonal Run Timing for Steelhead at Rock Island Adult Fishways Based on Returns During Period of 1998 to 2022

Table 5.3-23 Summer Steelhead Use of the Rock Island Project

LIFE HISTORY STAGE	TIMING	HABITAT USE	DESCRIPTION
Adult	Year-round	Migration Corridor and Holding	Returning adults use the Columbia River as a migration corridor. Adults ascend subbasin tributaries in autumn or overwinter in reservoirs before ascending natal subbasin rivers in March to May.
Kelt	April to June	Migration Corridor and Holding	Kelts migrate downstream after spawning
Incubation	NA	None	Spawning and incubation take place in subbasin tributaries.
Juvenile	NA	None	Juvenile rearing takes place in subbasin tributaries.
Smolt	April to June	Migration Corridor	Smolts use the Columbia River as a migration corridor.

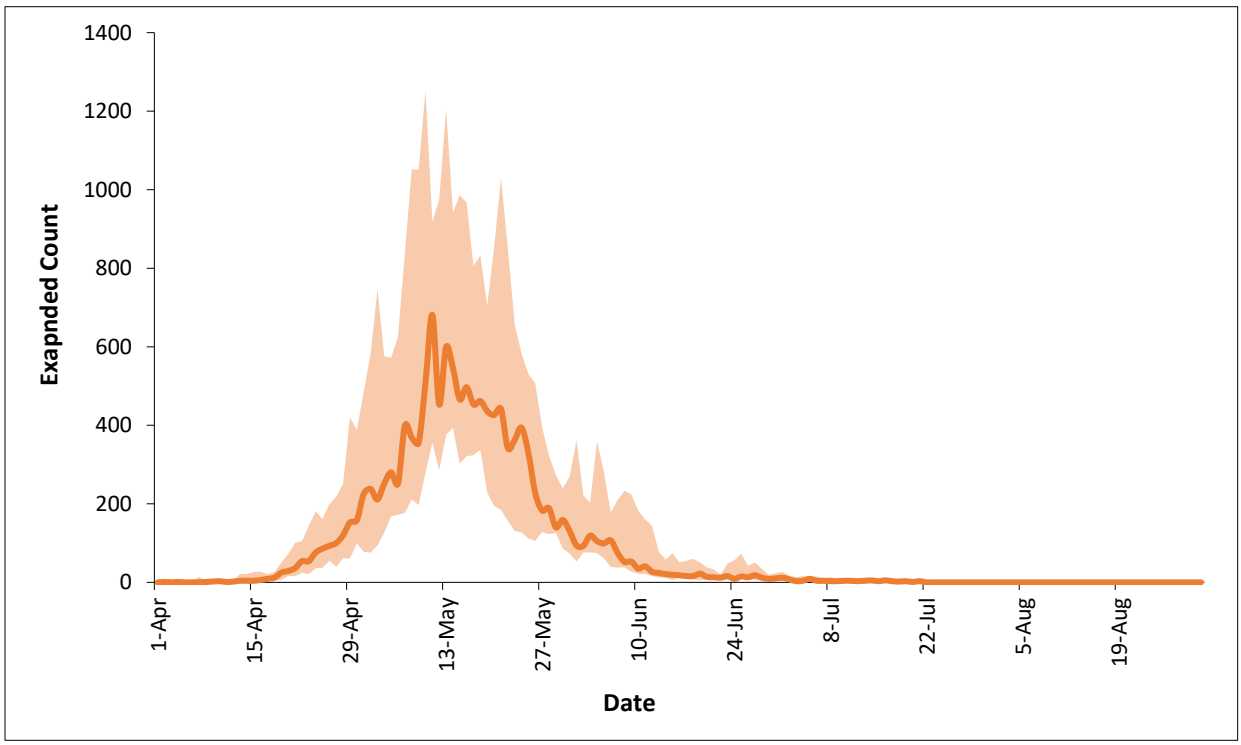
Sources: DART 2023a; Hillman et al. 2022; UCSRB 2007

Adult Conversion Rate

Among steelhead known to originate from tributaries upstream of the Rock Island Project, the conversion rate of migrating adults between Rock Island Dam and Rocky Reach Dam is 98.8 percent based on available PIT-tag data from 2006-2022 (DART 2023b).

Smolt Migration through the Rock Island Project

Steelhead smolts migrating downstream primarily pass the Rock Island Dam between April and June with the majority passing in May (Figure 5.3-20). Some smolts may migrate undetected prior to commencement of annual juvenile sampling at Rock Island Dam on April 1. The habitat within the Rock Island Project Boundary is considered a migratory corridor for juvenile steelhead (Table 5.3-23) (NMFS 2005b).



Source: Chelan PUD 2023b

Figure 5.3-20 Rock Island Juvenile Bypass Steelhead Smolt Expanded Counts, Median with 95% Confidence Intervals, 2010 to 2022

Status

Endangered Species Act Consultation Record

The UCR steelhead DPS is listed as threatened by NMFS (NMFS 2009) under the ESA. NMFS has administrative responsibility for the protection, conservation, and recovery of the UCR steelhead DPS. In this capacity, NMFS develops analyses and documentation to support the UCR steelhead

DPS listing status and status reviews, leads recovery planning efforts, and evaluates the effects of proposed actions that have a federal nexus using the consultation regulations in Section 7 of the ESA.

The UCR steelhead DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) originating below natural and manmade impassable barriers from the Columbia River and its tributaries upstream of the Yakima River to the United States-Canada border (NMFS 1997). The Crab Creek population is considered functionally extirpated (NMFS 2022). Two additional major population groups likely spawned upstream of the Chief Joseph and Grand Coulee dams but are extirpated (NMFS 2022).

The Wells Hatchery "Wells Stock" is considered essential to recovery and was initially the only hatchery population included in the listed DPS (NMFS 1997). In 2006, the DPS listing was changed to include steelhead from six artificial propagation programs: the Wenatchee River Program, Wells Hatchery Programs (in the Methow and Okanogan rivers), Winthrop NFH Program, Omak Creek Program (now the Okanogan River Program), and the Ringold Hatchery Program (NMFS 2006). NMFS determined that these artificially propagated stocks were no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the DPS (NMFS 2005a).

In response to the ESA listing of UCR steelhead in 1997 (NMFS 1997), the UCSRB initiated a recovery planning process in coordination with NMFS and with support from other local, state, federal, and tribal entities. In 2007, the UCSRB completed the Recovery Plan (UCSRB 2007). The recovery objectives identified in the plan included (UCSRB 2007):

- Increase the abundance and productivity of naturally produced spring Chinook and steelhead within each population in the UCR ESU to levels that would lead to reclassification of the ESU and DPS as threatened under the ESA.
- Increase the current distribution of naturally produced spring Chinook and steelhead in the UCR ESU and DPS and conserve genetic and phenotypic diversity.
- Increase the abundance of naturally produced spring Chinook and steelhead spawners within each population in the UCR ESU and DPS to levels considered viable.
- Increase the productivity (spawner to spawner ratios and smolts/redds) of naturally produced spring Salmon Chinook and steelhead within each population to levels that result in low risk of extinction.

- Restore the distribution of naturally produced spring Salmon Chinook and steelhead to previously occupied areas where practical and allow natural patterns of genetic and phenotypic diversity to be expressed.

NMFS has also conducted ESA Section 7 consultations and provided Section 10 incidental take permits related to the Rock Island Project. Previous Section 7 consultations have focused on the potential effects of the issuance of a Section 10 Incidental Take Permit for the Rock Island HCP (Chelan PUD 2002a), incorporation of the HCP into the Rock Island FERC license, and more recently on the implementation of Chelan PUD's HCP hatchery compensation program (Table 5.3-24).

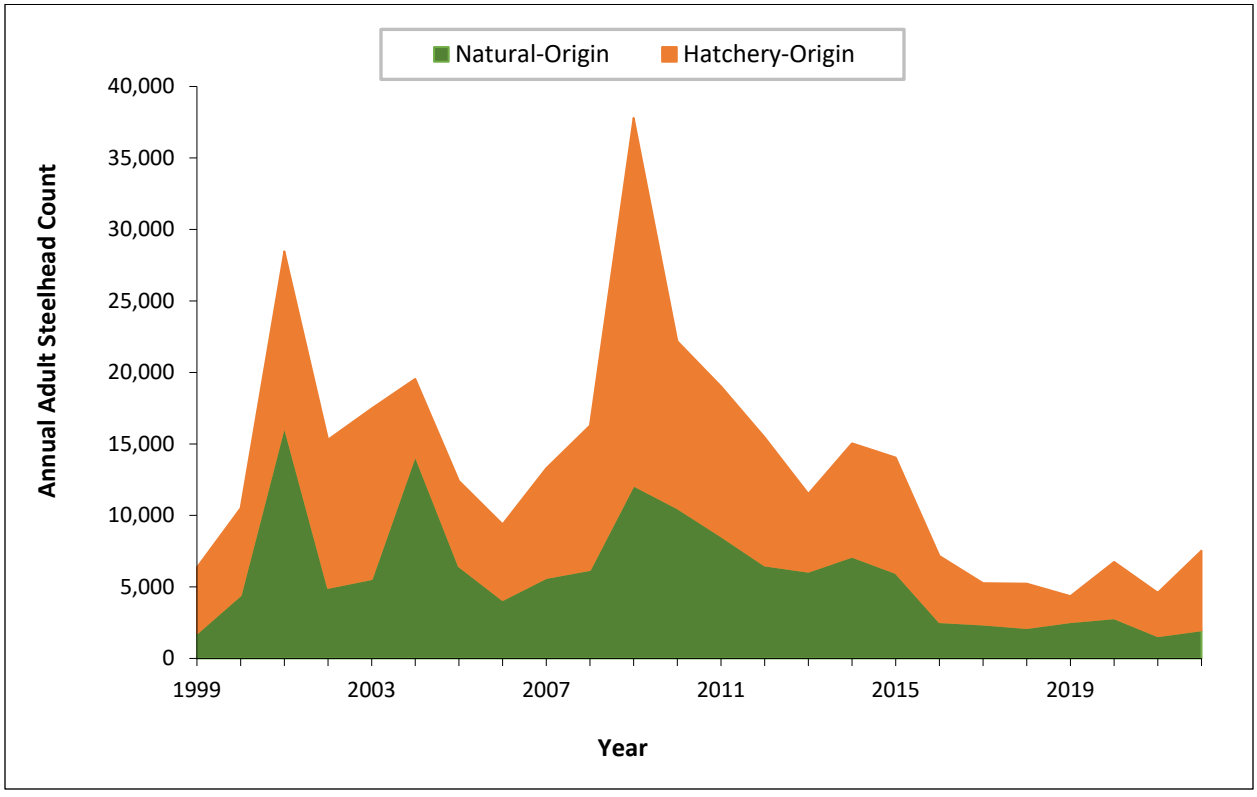
Table 5.3-24 Endangered Species Act Documents Related to Steelhead in the Upper Columbia

DOCUMENT	DATE	AUTHOR	DESCRIPTION
Biological Opinion (BiOp), Unlisted Species Analysis, and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Chelan County for the Rock Island Hydroelectric Project (FERC No. 943) Anadromous Fish Agreement and Habitat Conservation Plan and Construction of a Small Turbine Unit in the Attraction Water Conduit of the Left bank Adult Fishway	2003a	NMFS	"No jeopardy" BiOp for issuance of the Rock Island Incidental Take Permit No. 1393
Permit for Incidental Take of Endangered/Threatened Species. Permit 1393.	2003b	NMFS	Section 10 ESA permit issued to Chelan PUD
Endangered Species Act – Section 7 Consultation BiOp and Magnuson-Stevens Fishery Conservation and Management Act Consultation on the Federal Energy Regulatory Commission's Approval of the Proposed Anadromous Fish Agreement and Habitat Conservation Plan License Amendment for the Rock Island Hydroelectric Project License (FERC No. 943). NOAA Fisheries Consultation No. F/NWR/2003/05180.	2004	NMFS	"No jeopardy" BiOp for amendment of Project license to incorporate the Rock Island HCP
ESA Section 7(a)(2) BiOp and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation: Issuance of a Section 10(a)(1)(A) Permit 18583 for the Upper Columbia Wenatchee River Summer Steelhead Hatchery Program. NMFS Consultation Number: NWR-2013-9707.	2016b	NMFS	"No jeopardy" BiOp for issuance of a Section 10 permit for the Wenatchee River Summer Steelhead Hatchery Programs

Population Trends

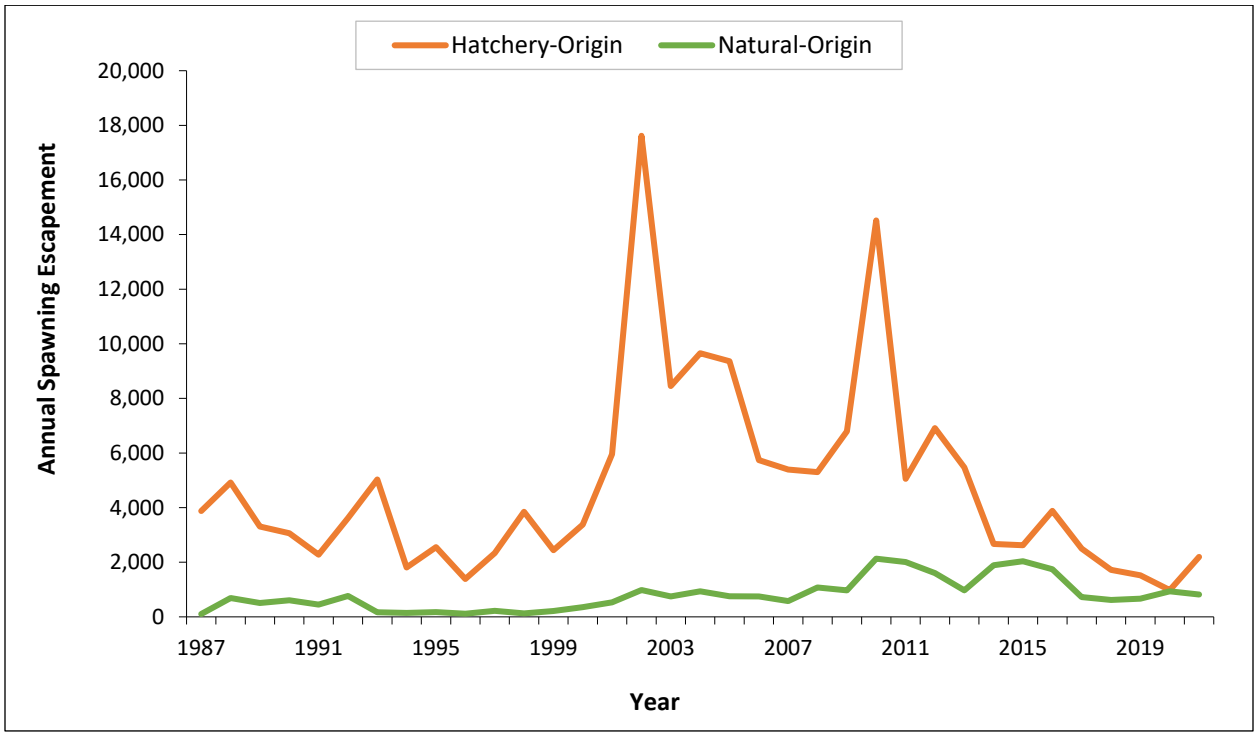
NMFS' most recent 5-year status review found the DPS was at a high overall biological risk with decreasing abundance and no change in spatial structure or diversity (NMFS 2022). The pattern of decreasing abundance in recent years is apparent in both Rock Island Adult Fishway counts (Figure 5.3-21) and spawning escapement data (Figure 5.3-22). Historically, steelhead counts at the Rock Island Adult Fishways have ranged from less than 5,000 fish in 2019 to over 37,000 in 2009 (Figure 5.3-21).

Implementation of hatchery programs has increased the overall number of returning adults but the number of natural-origin spawners in the UCR DPS has remained low (Figure 5.3-21). Natural-origin spawning escapement peaked between 2010 and 2015 (Figure 5.3-22) (Ford 2022), but the average proportion of natural origin spawners has been less than 0.20 since 1987. Within individual tributary subbasins, pHOS has varied considerably among years and subbasins with pHOS values typically exceeding 0.50 (Figure 5.3-23).



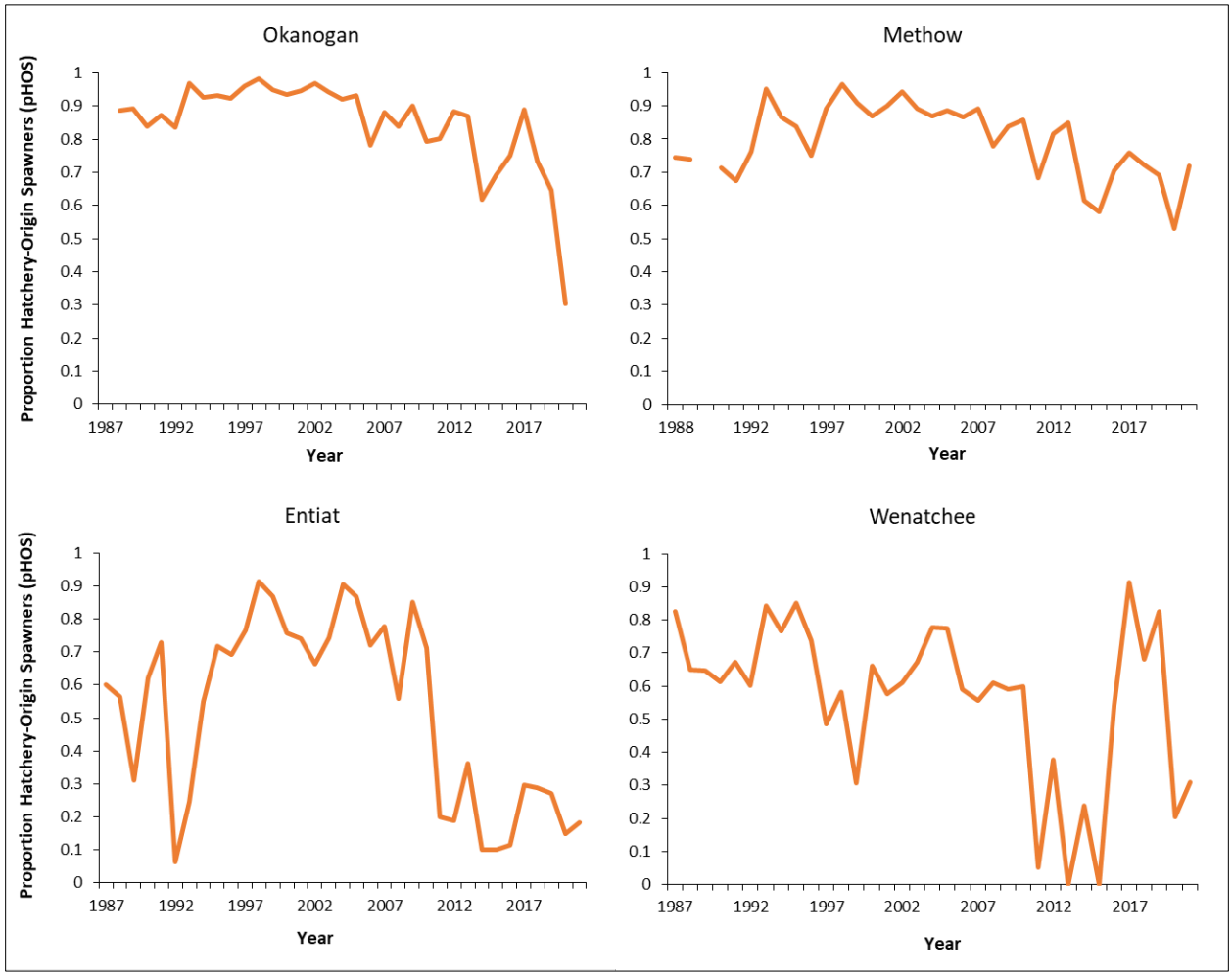
Source: DART 2023a
Note: Period of record includes full range of years for which natural- and hatchery-origin steelhead have been enumerated at Rock Island Adult Fishways.

Figure 5.3-21 Annual Natural and Hatchery Origin Steelhead Counts at Rock Island Adult Fishways for the Period of 1999 to 2022



Source: WDFW 2023b
Note: Period of record includes full range of years for which escapement data have been collected.

Figure 5.3-22 Upper Columbia Summer Steelhead Distinct Population Segment Natural- and Hatchery-Origin Spawning Escapement, 1987 to 2021



Source: WDFW 2023b

Figure 5.3-23 Proportion of Hatchery Origin Spawners in the Methow, Entiat, and Wenatchee Subbasins, 1987 to 2021

Critical Habitat and Essential Fish Habitat

The Columbia River is designated critical habitat for UCR summer steelhead (NMFS 2005a) as a migration corridor. Critical habitat includes the stream channel(s) defined by the OHWM within the designated stream reaches.[41] This critical habitat in the Columbia River extends from the estuary upstream to Rock Island Dam and from Rock Island Dam upstream to Chief Joseph Dam. The Okanogan, Methow, Entiat, and Wenatchee subbasins are also listed as critical habitat. The Project is within the USGS HUC 1702001002 and HUC 1702001003 (Columbia River) and HUC 1702001105 (lower Wenatchee watershed) where critical habitat has been defined.

[41] https://www.fisheries.noaa.gov/inport/item/65293.

EFH has not been defined for steelhead (PFMC 2014). Steelhead stocks originating outside of Puget Sound are not federally managed, and thus do not have EFH established.[42]

Management

As discussed above, NMFS manages the UCR steelhead DPS under the ESA. The Yakama Nation, WDFW, USFWS, Chelan PUD, Douglas PUD, Grant PUD, and other entities operate hatchery programs and work to conserve and restore habitat. Management efforts also include coordination and partnerships with NGOs and local governments. Aspects of management include developing and implementing population management and fisheries plans and design and implementation of hatchery programs, habitat protection and restoration programs, and research, monitoring, and evaluation of the various programs and effects on the DPS.

Fisheries

Nearly all the harvest on hatchery-origin steelhead occurs within the Columbia River Basin (Hillman et al. 2022; Snow et al. 2022). Selective tribal fisheries and selective sport harvest for steelhead occur in the lower Columbia River. The UCR steelhead DPS fisheries are managed under a tiered system based on counts at Priest Rapids Dam. The fisheries are intended to control gene flow by removing hatchery-origin fish while allowing natural-origin fish to escape for spawning. Harvest impacts on ESA-listed species in Columbia River commercial, recreational, and treaty fisheries are managed under the 2018-2027 United States v. Oregon Management Agreement (NMFS 2022). Harvest rates of Wenatchee steelhead in the Lower Columbia River fisheries is typically less than 5-10 percent and is roughly 5 percent of the escapement above Priest Rapids Dam for UCR steelhead in the Wenatchee River and the Mainstem Columbia River for years when there is a recreational harvest (Hillman et al. 2022). The mean harvest rate for the steelhead above Wells Dam (2002-2016) is 7 percent and ranges from less than 1 percent to 18 percent for hatchery fish. The mean harvest rate of natural origin fish is 3 percent (2003-2016) and ranges from 1 percent to 7 percent (Snow et al. 2022).

Predation

Pinniped predation in the lower Columbia River is suspected to be a major source of mortality for returning adult UCR summer steelhead. During 2007-2018, Tidwell et al. (2019) documented annual pinniped predation rates on steelhead ranging from 2.2 percent to 11.0 percent at Bonneville Dam. Both California and Stellar sea lions have been documented preying on steelhead, however predation by Stellar sea lions has increased substantially in recent years (Tidwell et al. 2019). In recognition of the severity of pinniped predation occurring in the lower Columbia River,

[42] https://www.pcouncil.org/fact-sheet-habitat-and-essential-fish-habitat/.

NMFS has provided state and tribal resource managers with expanded authority to lethally remove sea lions preying on ESA-listed salmonids such as UCR steelhead. Specifically, the Endangered Salmon Predation Prevention Act (Public Law 115-329) was enacted in 2018 and amends section 120 of the Marine Mammal Protection Act to authorize increased removals of predators for the purpose of conserving ESA-listed salmonids.

Habitat Conservation Plan Implementation

The Rock Island HCP's Passage Survival Plan requires Chelan PUD to achieve 91 percent Combined Adult and Juvenile Project Survival or 93 percent Juvenile Project Survival standards for yearling steelhead migrants. Chelan PUD achieved the Juvenile Project Survival standards in 2010 at a 20 percent spill level and subsequently achieved the Combined Adult and Juvenile Project Survival in 2013 at a 10 percent spill level (Phase III Standards Achieved) (Table 5.3-25) (Chelan PUD and Anchor QEA 2021; Chelan PUD 2023a).

Table 5.3-25 Summary of Phase Designations and Project Survival at Rock Island by Yearling Steelhead Including Survival Standard and Date Achieved

SURVIVAL STUDY PERIOD	JUVENILE PROJECT SURVIVAL (PERCENT)	ADULT PROJECT SURVIVAL (PERCENT)	COMBINED JUVENILE AND ADULT PROJECT SURVIVAL (PERCENT)	ROCK ISLAND STEELHEAD PHASE DESIGNATION
2002-2010	96.75	NA	NA	Phase III Standard Achieved at 20% spill
2010-2013	96.75	99.31	96.08	Phase III Standard Achieved at 10% spill

Sources: Chelan PUD 2023a; Chelan PUD and Anchor QEA 2021
Note: Adult survival was not adjusted for harvest and is therefore a conservative estimate.

The newly recalculated Rock Island HCP hatchery compensation production target is 30,710 smolts, which are released in the Chiwawa River (Table 5.3-26). The balance of Chelan PUD's steelhead hatchery production (165,000 inundation and 39,780 NNI smolts) is for the Rocky Reach HCP (Table 5.3-26).

Table 5.3-26 Chelan PUD HCP No Net Impact Summer Steelhead Production Targets for Rock Island and Rocky Reach Dams

PROJECT	SPECIES	INUNDATION[1]	INITIAL PRODUCTION (THROUGH 2013)	RECALCULATED PRODUCTION (2014-2023)	RECALCULATED PRODUCTION (2024-2033)	RELEASE LOCATION
Rock Island	Summer Steelhead	--	200,000[2]	73,300[3]	30,710	Chiwawa
Rocky Reach	Summer Steelhead	165,000	35,000[1]	9,000	39,780	Chiwawa

[1]Inundation mitigation for loss of fish production due to inundation of the Columbia River by a dam.
[2]Production historically reared on Turtle Rock Island.
[3]Includes 13,000 for No Net Impact production and 60,300 for a species trade with Lake Wenatchee Sockeye Salmon.

Chelan PUD's UCR steelhead Hatchery Compensation Program contributes to other regional hatchery production programs funded or operated by USFWS, CTCR, Yakama Nation, Grant PUD, Douglas PUD, and WDFW. In total, the annual production target for UCR spring Chinook upstream of Rock Island Dam is over 850,000 smolts that are distributed among eight programs and three hatcheries, with additional acclimation sites (Table 5.3-27). In addition to traditional hatchery releases, the Yakama Nation receives steelhead kelts trapped at Rock Island Dam for their kelt recovery program. The Yakama Nation, in partnership with USFWS, have been reconditioning and releasing steelhead kelts that were spawned at the Winthrop NFH. Additionally, the CTCR have implemented a kelt reconditioning plan in the Okanogan River at their St. Mary's hatchery facility.

Chelan PUD implements a comprehensive hatchery M&E Plan (Hillman et al. 2019) to evaluate the performance of the UCR steelhead hatchery program relative to conservation and production objectives established by the HCP Hatchery Committees. The M&E Plan is updated every 10 years with revisions conducted as needed in interim years and is approved by members of the HCP Hatchery Committee. The implementation of Chelan PUD's hatchery monitoring and evaluation program is described in detail within Section 4.3.

Table 5.3-27 Steelhead Hatchery Programs in the Upper Columbia River

HATCHERY	PROGRAM	PROGRAM OWNER	FUNDING SOURCE	BASIN OR SUBBASIN	RELEASE LOCATION	PROGRAM SIZE
Chiwawa	Summer Steelhead	Chelan PUD	Chelan PUD	Wenatchee	Chiwawa River	165,000
Chiwawa	Summer Steelhead	Chelan PUD	Chelan PUD	Wenatchee	Chiwawa River	70,490
Wells	Methow/Twisp Conservation	Douglas PUD	Douglas PUD	Methow	Methow/Twisp Rivers	17,111
Wells	Methow/Twisp Conservation	Douglas PUD	Douglas PUD	Methow	Methow/Twisp Rivers	22,889
Wells	Methow Safety-Net	Douglas PUD	Douglas PUD	Methow	Methow River	77,111
Wells	Columbia Safety-Net	Douglas PUD	Douglas PUD	Columbia	Columbia River	200,000
Wells	Okanogan	Douglas PUD	Grant PUD	Okanogan	Okanogan Subbasin	100,000
Winthrop	Methow Summer Steelhead	USFWS	USFWS	Methow	Methow River	200,000

Sources: Chelan PUD 2023a; Douglas PUD 2022; Grant PUD 2022; NMFS 2016c

In addition to Passage Survival and Hatchery Compensation Plans, Chelan PUD also funds projects for the protection and restoration of tributary habitat for UCR steelhead through implementation of the Rock Island HCP's Tributary Plan. See Table 5.3-7 for information on the Chelan PUD Tributary Fund.

5.3.6.7 Pacific Lamprey

Information on the life history, status, and management of Pacific Lamprey are included below. A technical memorandum providing additional details on Pacific Lamprey life history and the newest available reports and unpublished data related to the ecology, behavior, and abundance of Pacific Lamprey throughout their range and at the Rock Island Project is attached in Appendix E.2 (Four Peaks 2023b).

Life History and Habitat

The Pacific Lamprey is a parasitic anadromous fish of the order Petromyzontiformes (jawless fishes) that are distributed throughout the Pacific Rim, from Hokkaido, Japan and Baja, California, north to the Bering Sea (Beamish 1980; Orlov et al. 2008; Clemens et al. 2013). The morphology of the Pacific Lamprey is characterized by slender, elongated bodies, gill pores, absence of paired fins and scales, and an oral disk with sharp teeth for feeding during the marine parasitic phase (Clemens et al. 2019). The semelparous[43] species grows to an average length of approximately 26 in. and 1.1 lbs in the Columbia River (Keefer et al. 2009). Pacific Lamprey live up to 18 years of age including a highly variable time in freshwater (3 to 11 years) and at sea (3 to 7 years; Hess et al. 2022). Pacific Lamprey play an important role in both freshwater and marine ecosystems and are a culturally important species for several Indian Tribes in the Pacific Northwest (Orlov et al. 2008; Clemens et al. 2017).

Juvenile Pacific Lamprey reside as microphagous-feeding larva (ammocoetes) burrowed in fine sediments in shallow backwaters of streams (Beamish and Levings 1991; Clemens et al. 2017). Between three and 11 years of age, ammocoetes undergo a transformation to prepare for seaward migration (Beamish and Levings 1991; Hess et al. 2022). The metamorphosed juveniles, commonly known as transformers or macrophthalmia (Clemens 2019), begin their seaward migration in conjunction with spring flows and freshets over a period that spans from March to July (Beamish and Levings 1991; Goodman et al. 2015). Juvenile lampreys are preyed upon by native and non-native fishes and birds during their outmigration (Arakawa and Lampman 2020; Arakawa et al. 2021).

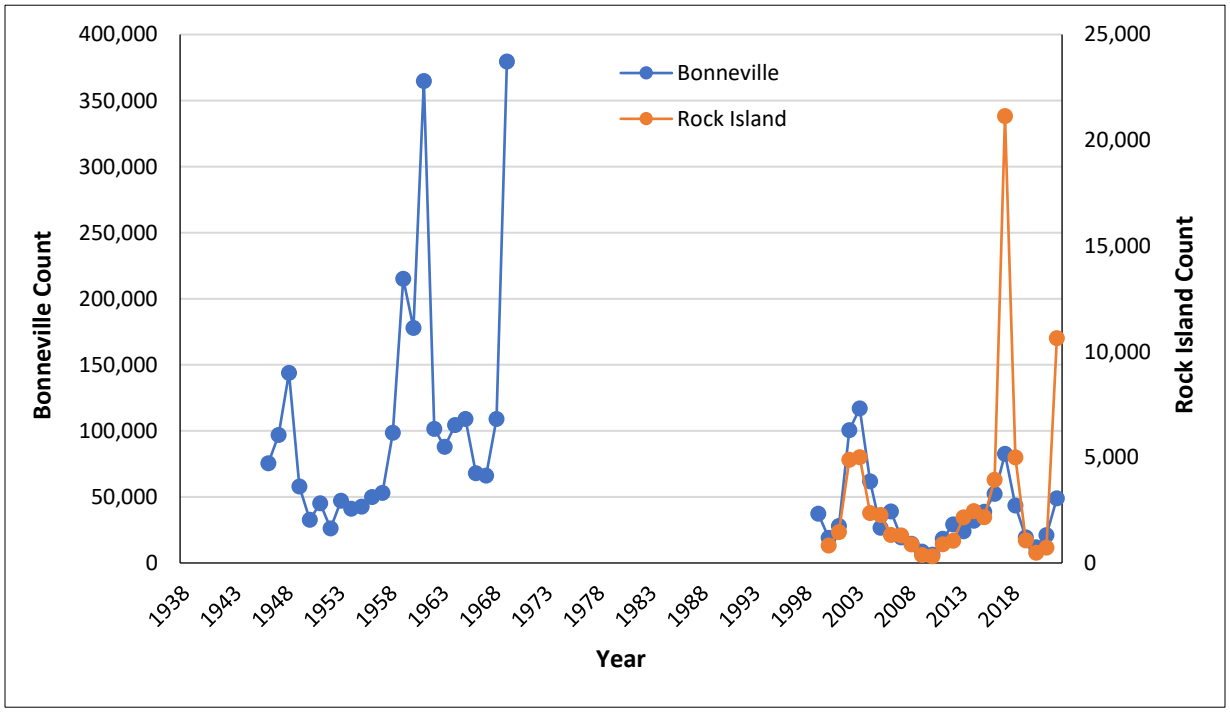
[43] Reproducing or breeding only once in a lifetime.

After a period of 3 to 7 years of feeding on a variety of hosts in the ocean over a broad geographic range (Orlov et al. 2008; Murauskas et al. 2019; Hess et al. 2022), Pacific Lamprey return to freshwater systems to reproduce. Pacific Lamprey do not home to natal river basins but locate suitable rivers using chemical cues from ammocoetes (Spice et al. 2012; Moser et al. 2015). Reproductive timing is highly variable throughout their range, but in the Columbia River Basin, the majority (80 percent) of adult Pacific Lamprey pass Bonneville Dam (RM 146.1) over a period of 66 days centered on July 12 (DART 2023d). In comparison, most adult Pacific Lamprey pass Rock Island Dam (RM 454) over a period of 45 days centered August 23 (DART 2023d). Adults typically overwinter for 1 year prior to spawning the following spring (Clemens et al. 2013; Hess et al. 2022). Spawning in the Columbia River Basin occurs in rivers and streams between April and June (Beamish 1980; Brumo et al. 2009). Adults move stones with their oral disk to create nests and then fan sediment out using their tails (Johnson et al. 2015). Fecundity is often above 125,000 eggs (Clemens et al. 2013; Johnson et al. 2015) and generally hatch within 2 weeks depending on temperature (Yamazaki et al. 2003). Adult lamprey typically die within a few days of spawning (Clemens et al. 2013).

Status

Pacific Lamprey are not listed under the ESA, but are considered a USFWS Species of Concern, a SGCN, and a PHS (WDFW 2021b). Pacific Lamprey abundance in the Columbia River is monitored in fishways at hydroelectric projects. Despite undocumented passage routes, mixed brood years, and milling behavior, fishway counts offer the best available representation of trends in Pacific Lamprey abundance in the Pacific Northwest (Clabough et al. 2012; Murauskas et al. 2016). The first 13 years of Pacific Lamprey counts at Bonneville Dam (1946-1958) averaged 62,322 adults, followed by a 370 percent increase to 364,805 adults by 1961 (DART 2023d). Annual counts then decreased to 66,171 adults by 1967 prior to the 1969 record return of 379,509 adults. After 1969, counts of Pacific Lamprey were stopped at Bonneville Dam and no data were collected for nearly 3 decades. Counts resumed at Bonneville Dam in 1999 and efforts were initiated at multiple other projects, including Rock Island Dam, by 2000 (Figure 5.3-24).

Since 1999, Pacific Lamprey counts to Bonneville Dam have averaged 37,486 adults (range 6,234 to 117,029). The recent peaks in Pacific Lamprey abundance are encouraging but are less than a third of historic peaks, thus suggestive of a highly variable but general decline in Pacific Lamprey abundance in the Columbia River Basin.



Source: DART 2023d

Figure 5.3-24 Annual Counts of Adult Pacific Lamprey at the Bonneville and Rock Island Hydroelectric Project Fishways, 1946-2022

Factors that limit Pacific Lamprey abundance in freshwater systems have been documented and summarized by several researchers. Aside from threats that lack clear solutions for management (e.g., predation, disease, and climate change) or those no longer in practice (e.g., poisoning by rotenone), most research and management on Pacific Lamprey is focused on passage barriers, habitat loss or alterations, and environmental conditions. Passage barriers include irrigation, flood control, and hydroelectric dams—many of which lack fishways—water diversions, screens, culverts, and other anthropogenic structures that obstruct or delay migration (Luzier et al. 2011; Clemens et al. 2017). Some of these structures, such as submerged bar screens at juvenile salmon bypass systems, have the potential to inflict injury or death to juvenile lampreys (Moursund et al. 2003). Habitat and environmental conditions known to affect Pacific Lamprey include reduced stream complexity, increased water temperatures, flow alterations, water quality, toxics, dewatering, dredging and excavation, and loss of fine sediment (Luzier et al. 2011; Clemens et al. 2017). Factors most relevant to the Rock Island Project include passage of juvenile and adult lampreys during their seaward and spawning migrations, respectively. An infrastructure assessment for adult Pacific Lamprey was conducted in January 2023 at the Rock Island fishways (see Appendix G.3) (Four Peaks 2023c). During the assessment, features identified included perched orifices, overhanging surfaces in passage areas (i.e., protruding PIT-tag arrays), and discontinuous surfaces in high velocity areas in all three fishways. Other areas that were more

localized and fishway-specific included the presence of continuously operated artificial light, dead-end routes, and 90 degree turns in the fishway. Passage routes that potentially allow lamprey to circumvent the count stations were also identified. Conversely, some areas were found to be consistent with recommendations from the Lamprey TWG (2022), such as orifices flush with the fishway floor and overflow weirs with water velocity well within the swimming capabilities of adult Pacific Lamprey (see Appendix G.3) (Four Peaks 2023c).

Management

Conservation efforts for Pacific Lamprey were established in the 1990s following population declines and increased awareness of their ecological and cultural importance in the Pacific Northwest. Columbia River Inter-Tribal Fish Commission (CRITFC) developed the Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin in 2011 (CRITFC 2011), concurrent with the USFWS' Pacific Lamprey Assessment and Template for Conservation Measures (Luzier et al. 2011). Near the Rock Island Project, the Mid-Columbia River Public Utility Districts implement Pacific Lamprey Management Plans for the Rocky Reach, Priest Rapids, and Wells Hydroelectric Projects.

5.3.7 Resident Fish

Approximately 40 additional native and introduced species are expected to occur in and around the Rock Island Project (Table 5.3-28). This list includes species observed during management activities at the Rock Island Project (e.g., Chelan PUD 2017 and 2021), documented in regional fisheries publications (Scholz and McLellan 2010; Wydoski and Whitney 2003) or inferred presence based on documented occurrence in upstream and downstream reservoirs (WDFW 2013a and 2018).

Table 5.3-28 Resident Fish (Native and Introduced) Expected to Occur Within the Rock Island Project Boundary

SCIENTIFIC NAME	COMMON NAME
NATIVE FISHES	
Acipenser transmontanus	White Sturgeon
Catostomus columbianus	Bridgelip Sucker
Catostomus macrocheilus	Largescale Sucker
Catostomus catostomus	Longnose Sucker
Catostomus platyrhynchus	Mountain Sucker
Coregonus clupeaformis	Lake Whitefish
Prosopium williamsoni	Mountain Whitefish
Cottus bairdii	Mottled Sculpin
Cottus beldingi	Paiute Sculpin
Cottus asper	Prickly Sculpin
Cottus confusus	Shorthead Sculpin

SCIENTIFIC NAME	COMMON NAME
Cottus rhotheus	Torrent Sculpin
Acrocheilus alutaceus	Chiselmouth
Rhinichthys falcatus	Leopard Dace
Rhinichthys cataractae	Longnose Dace
Ptychocheilus oregonensis	Northern Pikeminnow
Mylocheilus caurinus	Peamouth
Richardsonius balteatus	Redside Shiner
Rhinichthys osculus	Speckled Dace
Rhinichthys umatilla	Umatilla Dace
Lota	Burbot
Gasterosteus aculeatus	Threespine Stickleback
Salvelinus confluentus	Bull Trout
Oncorhynchus mykiss	Coastal Rainbow Trout
Oncorhynchus clarkii lewisi	Westslope Cutthroat Trout
NON-NATIVE FISHES	
Pomoxis nigromaculatus	Black Crappie
Lepomis macrochirus	Bluegill
Micropterus salmoides	Largemouth Bass
Lepomis gibbosus	Pumpkinseed
Micropterus dolomieu	Smallmouth Bass
Pomoxis annularis	White Crappie
Ameiurus melas	Black Bullhead
Ameiurus nebulosus	Brown Bullhead
Ictalurus punctatus	Channel Catfish
Sander vitreus	Walleye
Perca flavescens	Yellow Perch
Percopsis transmontana	Sand Roller
Cyprinus carpio	Common Carp
Tinca tinca	Tench

Sources: Chelan PUD 2017 and 2021; Scholz and McLellan 2010; WDFW 2013a; WDFW 2018; Wydoski and Whitney 2003

The management objectives for resident fish species not managed in the HCP vary considerably. Some species such as Bull Trout and White Sturgeon are ecologically and culturally significant and have regional conservation and recovery objectives that have been developed by state, tribal and federal fishery managers. These species were prioritized and management plans were developed for each during the relicensing of other UCR hydroelectric projects including Wells, Rocky Reach, and Priest Rapids. Other resident fish occurring at the Rock Island Project have been targeted for removal such as Northern Pikeminnow (*Ptychocheilus oregonensis*), Walleye (*Sander vitreus*), and Smallmouth Bass (*Micropterus dolomieu*). Northern Pikeminnow is a native species that preys heavily on migrating juvenile salmonids (Vigg et al. 1991). WDFW encourages removal of Northern Pikeminnow through fishing regulations that do not limit the size or number of fish harvested

(WDFW 2022). Since 1995, Chelan PUD has implemented a Northern Pikeminnow removal program to selectively remove these fish from Project waters. The program has provided funding for the USDA and other contractors to harvest Northern Pikeminnow. In addition, Chelan PUD has allocated internal staffing resources and sponsored local fishing derbies to increase the number of fish removed annually (Chelan PUD 2021).

Walleye and Smallmouth Bass are non-native species that have also been identified as potential salmonid predators within the Columbia River (Vigg et al. 1991). In 2013, WDFW changed fishing regulations within the Rock Island Project Boundary to allow unlimited harvest of any size of Walleye or bass species (WDFW 2013b) to reduce their population abundance and associated predation impacts (McMichael et al. 2021). Prior to 2013, fishing regulations limited the harvest of large Walleye and Smallmouth Bass (WDFW 2012) which promoted the survival of the largest and most fecund individuals and opportunities to catch trophy sized fish. In the Columbia River upstream of Chief Joseph Dam, current regulations still limit the retention of large Walleye (limit of one fish per day over 22 in. in length) and Smallmouth Bass (limit of one fish per day over 12 in. in length; WDFW 2022) which may create an additional source of new recruitment within the Rock Island Project Boundary.

Some resident fish do not have explicit management objectives but have harvest provisions identified in WDFW fishing regulations for "Game Fish." Native suckers (i.e., Bridgelip sucker[*Catostomus columbianus*], Largescale sucker [*Catostomus macrocheilus*], Longnose sucker [*Catostomus Catostomus*], Mountain Sucker [*Catostomus platyrhynchus*]), Peamouth (*Mylocheilus caurinus*) and non-native Crappie (i.e., Black Crappie [*Pomoxis nigromaculatus*] and White Crappie [*Pomoxis annularis*]), Carp (*Cyprinus carpio*), Yellow Perch (*Perca flavescens*), Bluegill (*Lepomis macrochirus*), Pumpkinseed (*Lepomis gibbosus*), and Channel Catfish (*Ictalurus punctatus*) have no minimum size for retention or limit on catch. Native Whitefish (i.e., Lake Whitefish [*Coregonus clupeaformis*] and Mountain Whitefish), kokanee, and Burbot (*Lota*) have no minimum size for retention and catch limits of 15, 10, and 5 fish daily, respectively (WDFW 2022).

Some resident fish are not currently protected under federal or state endangered species programs but have identified conservation concerns or needs because of distribution-wide population declines, habitat degradation, or other factors. These unlisted SGCN include Burbot, Leopard Dace, Mountain Sucker, Umatilla Dace (*Rhinichthys Umatilla*), and Westslope Cutthroat Trout (WDFW 2015). The status of all these species is unknown with the exception of Westslope Cutthroat Trout which is considered to be "stable and abundant" (WDFW 2015). For Burbot, Leopard Dace, Mountain Sucker, and Umatilla Dace, no population or management data has been collected in the Rock Island Project area and their occurrence is expected but has not been confirmed.

5.3.7.1 Bull Trout

Information on the life history, status, and management of Bull Trout are included in the sections below. A technical memorandum that compiles and consolidates recently available reports and unpublished data related to the ecology, behavior, and abundance of Bull Trout in the area of the Rock Island Project is attached as Appendix E.3 (Four Peaks 2023d).

Life History

Bull Trout are a native char species endemic to the Columbia and Snake River basins and other habitats within western North America ranging from southeast Alaska to Southcentral Oregon. Near the Rock Island Project, the USFWS has identified three core areas within the Mid-Columbia Recovery Unit that contain both Bull Trout habitat and Bull Trout populations: Wenatchee, Entiat, and Methow River basins (USFWS 2015a).

Bull Trout habitat requirements vary by population, but common features of suitable habitat include high channel stability, substrate with low quantities of fine sediments, and the presence of cover represented by complex channel structure, wood, and other velocity refugia. They also require migratory corridors to access spawning and rearing habitats (Rieman and McIntyre 1993). Bull Trout require cold water for all life history stages, and their distribution is constrained by access to thermally acceptable habitats (Rieman et al. 2007). They typically spawn in habitats at or below 9˚C (48.2°F) and optimal incubation occurs at 2 to 4˚C (35.6 to 39.2 °F) (McPhail and Baxter 1996). During rearing, temperatures around 13˚C (55.4°F) are ideal for growth (Selong et al. 2001). If temperatures reach or exceed 16˚C (60.8°F), Bull Trout may reduce feeding (Selong et al. 2001) or seek cooler habitats (McPhail and Baxter 1996). Bull Trout exposed to temperatures above 20˚C (68°F) exhibit high levels of stress or mortality with prolonged exposure (Selong et al. 2001).

Bull Trout generally spawn in fall months in small river or stream habitats. Fertilized eggs develop for 1.5 to 4 months prior to hatching and emergence occurs about 3 weeks thereafter. Water temperature controls the rate of embryonic development with warmer temperatures accelerating the time of hatching. Developing fry use low velocity habitats with cover in shallow side-channels or near the shoreline. Juveniles rear in areas with undercut banks, woody debris, and variable flow environments with pools glides and riffles. Adult habitat use diverges among different life history types but may include stream, river, lake, and marine habitats (McPhail and Baxter 1996).

Bull Trout exhibit complex life history patterns including resident and migratory forms. Resident fish spawn, rear, and live their adult lives in smaller tributary habitats. Migratory Bull Trout are further subdivided into fluvial, adfluvial, or anadromous forms depending on where they spend their adult life. Fluvial Bull Trout spawn and rear in small tributary streams but reside in larger

rivers as adults. Adfluvial Bull Trout spawn and rear in tributary habitats but occupy lake habitats as adults (McPhail and Baxter 1996). Anadromous Bull Trout also use freshwater riverine spawning and rearing habitats but are distinguished by their use of estuarine or marine habitats as adults. Anadromy has been documented in coastal areas such as the Olympic Peninsula of Washington State (Corbett and Brenkman 2012). However, within the UCR only, resident, fluvial, and adfluvial forms have been observed (Barrows et al. 2016).

Bull Trout are efficient predators that can grow to almost a meter in length and live to 10 years or more. As juveniles, Bull Trout initially feed on a variety of insects and small crustaceans, but their diet typically shifts towards other fish species and growth accelerates rapidly thereafter. As adults, Bull Trout are apex predators and feed almost exclusively on fish (McPhail and Baxter 1996). In habitats where other fish species are not available to prey upon, maximum growth is constrained (Rieman and McIntyre 1993). Where Bull Trout have overlapping distributions with anadromous salmonids, they can acquire a substantial portion of their energetic requirements from feeding on eggs and tissue from anadromous spawners or by preying on out-migrating smolts (Lowery 2009). In some habitats, Bull Trout have coevolved with anadromous salmonids and sequence feeding behavior to capitalize on the seasonal abundance of out-migrating smolts (Furey et al. 2015).

In the UCR, Bull Trout use the mainstem Columbia River for foraging, migration, and overwintering habitats. At the Rock Island Project, Bull Trout migrations and movements have been documented using visual counts at the adult fishways, PIT-tag data collected from antennas within the adult fishways, and multiple radio telemetry studies (e.g., Chelan PUD 2002a; BioAnalysts 2009; Four Peaks 2022).

Interpreting Bull Trout use of mainstem Columbia River habitats and interactions with hydropower projects is complicated by the fact that Bull Trout do not have a strict migratory template common to anadromous salmonid species. Bull Trout migrating from tributary habitats to the mainstem Columbia River may subsequently move upstream or downstream within the Columbia River (Four Peaks 2022), enter a different tributary, or overwinter/reside in mainstem habitats for a year or more (Nelson and Nelle 2008). Some migratory Bull Trout emigrate from tributary habitats to mainstem habitats as subadults, while others may not migrate until they are adults (Four Peaks 2022). As Bull Trout are long-lived (McPhail and Baxter 1996) and may travel extensively between different tributary and mainstem habitats (Barrows et al. 2016), the behavioral driver for upstream or downstream passage events could be related to feeding, spawning, overwintering, or other environmental cues that vary among years and by life history stage (Nelson and Nelle 2008).

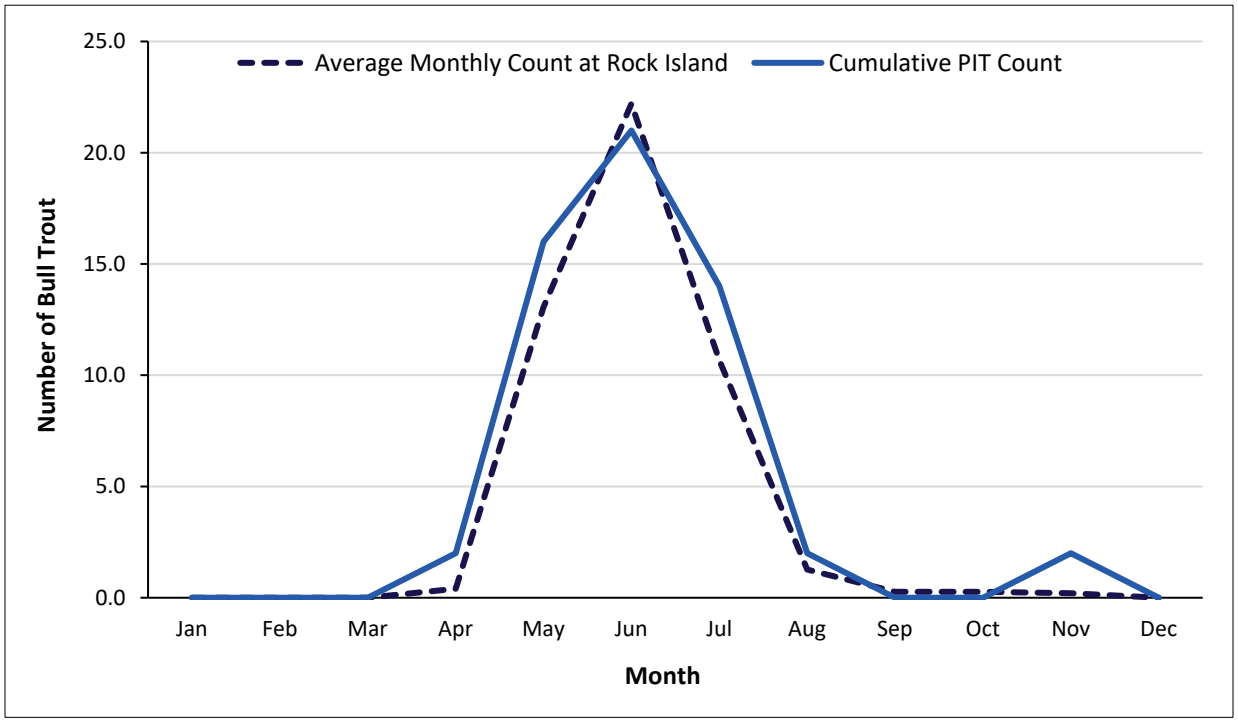
Bull Trout movements and use of mainstem Columbia River habitats in the Rock Island Reservoir have been documented through Chelan PUD's implementation of the Rock Island Bull Trout

Management Plan (BTMP) (Chelan PUD 2005), the Rocky Reach BTMP (Chelan PUD 2006a), the Rock Island HCP (Chelan PUD 2002a), and other regional studies.

Between 2002 to 2022 (Chelan PUD 2002a), a total of 1,175 Bull Trout were visually counted (DART 2023c) at the Rock Island Adult Fishways by Chelan PUD (see Appendix G.3) (Four Peaks 2023d). Counts have typically occurred April 15 to November 15 in compliance with the Rock Island HCP. However, in 2007 Chelan PUD extended the visual count period to include January 1 to April 14 to determine if Bull Trout passage events occurred in the winter and early spring as specified by the Rock Island BTMP (Chelan PUD 2005). No Bull Trout were observed in the fishways during the extra count period (Chelan PUD 2008). Beginning in 2019, visual counts of Bull Trout occurred year-round. Only one Bull Trout was observed outside the typical counting period since year-round counts began at Rock Island.

As part of the implementation of the Rock Island BTMP and Rocky Reach BTMP, and in consultation with the Rocky Reach Fish Forum, Chelan PUD conducted PIT-tag studies to investigate Bull Trout passage and interactions with the Rock Island, Rocky Reach, and Tumwater Adult fishways, Rocky Reach Juvenile Fish Bypass, and Dryden Diversion Dam (Chelan PUD 2019; Four Peaks 2022). On average, less than four PIT-tagged Bull Trout were observed each year at the Rock Island Adult Fishway, and the maximum number of PIT tag detections was nine in 2010 while the minimum was zero in 2008, 2020, and 2022. Among the 57 PIT tag detection events, 37 originated from adult Bull Trout and 20 were from subadults (Four Peaks 2022). The number of individual PIT-tagged Bull Trout detected at the Rock Island Adult Fishway represented less than 1 percent of the Bull Trout that were PIT tagged prior to and during the study (2004-2022; PTAGIS 2023).

Independent visual count (DART 2023d) and PIT detection data (PTAGIS 2023) illustrate congruent seasonal passage timing patterns for Bull Trout at the Rock Island Adult Fishway (Figure 5.3-25) (DART 2023c; PTAGIS 2023). Both data sets suggest that passage at the Rock Island Adult Fishway typically occurred between April and September with peak passage occurring in June (Figure 5.3-25). As part of the Rock Island BTMP (Chelan PUD 2005), diel passage timing at the Rock Island Adult Fishway was evaluated for the period of 2007-2009. Passage events occurred in all hours of day and night periods, but peak passage occurred in the late morning between 9:00-12:00 (Chelan PUD 2009).



Source: DART 2023c; PTAGIS 2023

Figure 5.3-25 Bull Trout Monthly Passage Timing at Rock Island Dam Based on Cumulative Number of Passive Integrated Transponder Tag Detections and Average Monthly Window Counts between 2008-2022

Detailed accounts of Bull Trout movements and interactions at Rock Island, Rocky Reach, and Wells projects were also documented in a series of regional radio telemetry studies beginning in 2001 (BioAnalysts 2004 and 2009; Douglas PUD 2008). Using fixed and mobile tracking approaches, a total of 209 adult Bull Trout were observed passing upstream and downstream at each project. In total, 170 upstream passage events and 102 downstream passage events were documented between the years 2001 and 2009 (Table 5.3-29). At the Rock Island Project, Bull Trout used adult fishways to move upstream and spillway, turbine, or "unknown" routes to move downstream.

Table 5.3-29 Summary of Bull Trout Telemetry Evaluations Conducted by Mid-Columbia River PUDs, 2001 to 2009

STUDY	RADIO TAGGED BULL TROUT	UPSTREAM PASSAGE EVENTS	DOWNSTREAM PASSAGE EVENTS	PROJECT MORTALITIES
Movement of Bull Trout within the Mid-Columbia River and tributaries, 2001-2009	209	RIA: 15 RRF: 82 WEA: 73	RIA: 19 RRF: 56 WEA: 27	RIA: 0 RRF: 0 WEA: 0

Sources: BioAnalysts 2004 and 2009; Douglas PUD 2008
Note: RIA = Rock Island; RRF = Rocky Reach; and WEA = Wells

Behavioral observations from five upstream passage events originating from four individual radio-tagged Bull Trout suggested that fish spent more time in the vicinity of the fishway entrances than time spent in the tailrace or within the fishway (BioAnalysts 2009). Although the sample size was small, the radio telemetry data illustrated variability in migration behavior among individual fish within portions of the upstream passage environment at Rock Island Dam. Interpreting Bull Trout passage efficiency with small samples sizes is challenging (Barrows et al. 2016) and further complicated by the wide range of behaviors Bull Trout display in mainstem habitats (Nelson and Nelle 2008). Because Bull Trout may spend a year or more in reservoir habitats (Nelson and Nelle 2008) or may be actively foraging near the dam (e.g., Bray 2003), it is difficult to discern whether detections in the tailrace or near a ladder entrance are representative of an ascension attempt or other behaviors.

No evidence of hydroelectric project-related mortality or injury was documented in any of the radio telemetry studies (BioAnalysts 2004 and 2009; Douglas PUD 2008). The lack of observed hydroelectric project-related injuries or mortality from radio telemetry data is consistent with high rates of successful project interactions observed in PIT-tag studies (Four Peaks 2022) and photographic condition assessments of Bull Trout passing Rock Island and Rocky Reach adult fishways (Four Peaks 2022).

Bull Trout found in the Columbia River within and adjacent to the Rock Island Project Boundary originate from the Wenatchee, Entiat, and Methow River basins. The life-history diversity and behavior of Bull Trout varies among these basins (Table 5.3-30) (USFWS 2015b) with the Methow and Wenatchee having the largest number of populations and life history forms. Bull Trout from the Entiat River Basin tend to use the mainstem Columbia River more often than those from the Methow and Wenatchee River basins (USFWS 2015b; Four Peaks 2022). The PIT-tag-based passage and interaction study (Four Peaks 2022) provided additional evidence that Bull Trout from the three river basins have different migratory behavior and likely different levels of interaction with the Rock Island Project (see Appendix E.3) (Four Peaks 2023d).

Table 5.3-30 Bull Trout Population Attributes Within the Wenatchee, Entiat, and Methow River Basins

SUBBASIN	NUMBER OF POPULATIONS	LIFE HISTORY FORMS PRESENT	PERCENT OF BULL TROUT THAT MIGRATE OUT OF TRIBUTARY SUBBASIN INTO MAINSTEM COLUMBIA RIVER
Wenatchee	7	Resident, Adfluvial, Fluvial	15
Entiat	2	Resident Fluvial	90
Methow	10	Resident, Adfluvial, Fluvial	15-20

Source: USFWS 2015b

The timing of spawning and migratory movements varies among the river basins and populations within each. The general timing of these activities for each river basin is described in (Table 5.3-31).

Table 5.3-31 General Timing of Spawning and Movements Between Tributary River Basins and Mainstem Columbia River

RIVER BASIN ORIGIN	SPAWNING PERIOD	MOVE FROM TRIBUTARY RIVER BASIN TO MAINSTEM COLUMBIA RIVER		MOVE FROM MAINSTEM COLUMBIA RIVER TO TRIBUTARY RIVER BASIN
		SUBADULT	ADULT	ADULT
Wenatchee	Mid-September to mid-October	March to June and September to December	September to February	April to September
Entiat	Mid-September to mid-October	March to June and September to December	September to February	April to September
Methow	Late August to early November	March to June and September to December	September to February	April to September

Sources: Barrows et al. 2016; DART 2023d; USFWS 2015b

Status

Bull Trout are listed as threatened under the ESA throughout the coterminous United States (64 FR 58910). USFWS has administrative responsibility for the protection, conservation, and recovery of Bull Trout. In this capacity, USFWS develops analyses and documentation to support Bull Trout listing status and status reviews, leads recovery planning efforts, and evaluates the effects of proposed actions that have a federal nexus using the consultation regulations in Section 7 of the ESA. The mainstem Columbia River and tributaries in the Rock Island Project area are designated as critical habitat for Bull Trout (75 FR 63898). Bull Trout are also listed in the WDFW PHS (WDFW 2021b).

USFWS 5-Year Review

The most recent 5-year status review for Bull Trout (USFWS 2008a) assessed population trends and risks for Wenatchee, Entiat, and Methow River basins (core areas) and identified a population abundance category and short-term abundance trends for each (Table 5.3-32). For the metric USFWS assigned "High Risk" to the Methow River followed in descending order by the Entiat River ("At Risk") and Wenatchee River ("Potential Risk").

The risk designations used the following categories:

- High Risk – Core area at high risk because of extremely limited and/or rapidly declining numbers, range, and/or habitat, making the Bull Trout in this core area highly vulnerable to extirpation.
- At Risk – Core area at risk because of very limited and/or declining numbers, range, and/or habitat, making the Bull Trout in this core area vulnerable to extirpation.
- Potential Risk – Core area potentially at risk because of limited and/or declining numbers, range, and/or habitat even though Bull Trout may be locally abundant in some portions of the core area.

Table 5.3-32 USFWS Population Abundance and Risk Assessment for Bull Trout in the Wenatchee River, Entiat River, and Methow Core Areas

CORE AREA	POPULATION ABUNDANCE CATEGORY (INDIVIDUALS)	SHORT-TERM TREND RANK	FINAL RANK
Wenatchee River	250-1,000	Stable	Potential Risk
Entiat River	50-250	Stable	At Risk
Methow River	50-250	Declining	High Risk

Source: USFWS 2008a

As a component of the Final Bull Trout Recovery Plan (USFWS 2015a), the Mid-Columbia Recovery Unit Implementation Plan (MCRUIP) for Bull Trout (USFWS 2015b) also provided a status assessment of Wenatchee, Entiat, and Methow subpopulations. The assessment relied heavily on the 2008 5-year review results noting that the Methow and Entiat are "at risk" but "declining rapidly" and the Wenatchee is at "potential risk" and "stable." The MCRUIP identified a wide range of primary habitat, demographic, and non-native threats to Bull Trout for the Wenatchee, Entiat, and Methow River basins.

Tributary Status Information

Continuous, long-term population abundance estimates for Bull Trout within the Wenatchee, Entiat, Methow River basins are rare. Redd surveys have been conducted intermittently within subbasin tributaries of each river basin by the USFWS, WDFW, and other entities since Bull Trout were initially listed in 1998. WDFW compiles redd count data from these sources on their Salmon Conservation and Reporting Engine (SCoRE) database.[44] For this status assessment, population abundance information was derived using redd survey data obtained from SCoRE (WDFW 2023b). Specifically, redd counts for tributaries within the Wenatchee, Entiat, and Methow River basins were compiled and compared for available years between the periods prior to the 5-year Bull

[44] https://fortress.wa.gov/dfw/score/score/.

Trout Status Review ("Pre-status Review"; 1994-2007) and from the 5-year Bull Trout Status Review to the most recent data points available ("Status Review to Present"; 2008-2021). Spawner number was expanded following the methods of Al-Chokhachy et al. (2011) with low, middle, and high range values of 1.2, 2.68, and 4.3 spawners-per-redd for Columbia River Bull Trout to establish an estimate of adults in each river basin (see Appendix E.3) (Four Peaks 2023d).

For the Wenatchee and Methow River basins, average cumulative redd counts increased by 170 and 62 redds between the Pre-Status Review and Status Review to Present periods, respectively, while the Entiat had a decrease of 15 redds. For all river basins combined, the net number of redds increased by 217, representing a 33 percent increase over the Pre-Status Review period (see Appendix E.3) (Four Peaks 2023d).

During the Status Review to Present period, the low range of expanded Methow and Wenatchee River spawners was within the population abundance categories identified by USFWS in the 5-year status review (2008a) (Table 5.3-32), whereas the middle and high range estimates of expanded spawners exceeded the values identified within the population abundance categories (Table 5.3-32) for both basins. For the Entiat River, the low range of expanded spawners was below the minimum range of the population abundance category while the middle and high range estimates of expanded spawners was within the population abundance category for the core area (Table 5.3-32) (see Appendix E.3) (Four Peaks 2023d). In the Status Review to Present period, the total expanded spawner counts for Wenatchee, Entiat, and Methow River basins combined increased by a minimum of 261 or a maximum of 934 spawners based on the use of the low or high range expansion factors (i.e., 1.2 or 4.3 spawners-per-redd) from Al-Chokhachy et al. (2011) (see Appendix E.3) (Four Peaks 2023d). This suggests an overall increase in Bull Trout abundance among the three river basins since the 5-year status review was completed.

In addition to redd survey data, population abundance has also been assessed for the subpopulation of Bull Trout in the Chiwawa River using snorkel surveys. The Chiwawa River subpopulation is unique because it exhibits high levels of migratory life history diversity and is the only subpopulation considered to be "long term stable" among any of the core areas upstream of the Rock Island Project (USFWS 2015b). As such, abundance trends for the Chiwawa River likely have importance for the entirety of the Wenatchee River Basin. The Chiwawa River is also one of the only locations within the Wenatchee, Methow, and Entiat River basins where a long-term continuous population assessment has been conducted. Specifically, Chelan PUD funded 27 years of snorkeling surveys from 1992 to 2018 as part of its Rock Island and Rocky Reach HCP hatchery monitoring and evaluation program (Hillman et al. 2022). Data from the surveys were summarized for three periods: the period prior to ESA listing ("Pre-ESA listing"; 1992-1997), the period from ESA listing to the year prior to the 5-year Bull Trout Status Review ("ESA Listing to Pre-status

Review"; 1998-2007), and from the period of the status review to the end of the surveys ("Status Review to Completion"; 2007-2018).

Among the three periods evaluated, the average number of adults and total number of Bull Trout increased in each successive period while the number of juveniles was highest in the ESA Listing to Pre-status Review period. In the Status Review to Completion period, adult component of the population was over 200 percent greater than the ESA Listing to Pre-Status Review period and over 300 percent greater than the Pre-ESA Listing period (Table 5.3-33). The increase in adult abundance suggests that the population abundance (as defined in 5-year Bull Trout Status Review [USFWS 2008a]) has increased substantially in the Chiwawa River.

Table 5.3-33 Population Estimates for Chiwawa River Adult and Juvenile Bull Trout during "Pre-ESA Listing", "ESA Listing to Pre-status Review" and "Status Review to Completion Periods"

PERIOD	YEARS	AVERAGE NUMBER OF JUVENILES	AVERAGE NUMBER OF ADULTS	AVERAGE TOTAL POPULATION
Pre-ESA Listing	1992-1997	157	320	477
ESA Listing to Pre-status Review	1998-2007	216	486	703
Status Review to Completion	2008-2018	194	997	1190

Source: Hillman et al. 2022

The threats and abundance in each core area river basin and subbasin vary and have likely changed over time (USFWS 2015b). WDFW (2004) noted several broad harvest and hatchery-based factors that may have contributed to general increases in Bull Trout abundance in the 1990s including the ESA listing of UCR steelhead in 1997 and termination of put-and-take trout fisheries in tributary habitats. The UCR steelhead listing caused the closure of steelhead fisheries throughout the UCR and reduced opportunities for fishing-related mortality on incidentally captured Bull Trout. WDFW (2004) noted: "Hooking mortality and illegal harvest of Bull Trout/Dolly Varden in Lake Wenatchee are expected to decline significantly as a result of the closure of the recreational steelhead fishery".

Similarly, the closure of put-and-take trout fisheries in tributaries of the Wenatchee, Entiat, and Methow River basins in the 1990s was believed to reduce mortality on Bull Trout. As an example, WDFW (2004) noted:

"For many years catchable-size rainbow trout were released into the Chiwawa River below Trinity in the summer. Resulting fisheries increased harvest on all migratory stocks of bull trout/Dolly Varden within the basin. The program was discontinued in 1990."

In the Entiat River Basin, increasing redd numbers were attributed directly to reduced fishing efforts:

"The increase in numbers of Bull Trout redds can be attributed to the Bull Trout angling closure instituted in 1992 and the 1995-2003 total angling closure of the Mad River from mouth to Jimmy Creek." (Archibald and Johnson 2003).

WDFW (2004) also reported heavy fishing pressure from put-and-take fisheries in the Entiat River during the period from 1933 to 1996:

"Heavy stocking densities and intense fisheries in bull trout/Dolly Varden breeding habitat undoubtedly resulted in overharvesting and perhaps in negative interactions between native fish and hatchery-origin fish."

Introduced non-native species may have had a negative influence on Bull Trout through ecological and genetic interactions in both tributary and mainstem habitats. Brook Trout were historically stocked throughout the tributaries of the UCR and have established reproducing population after stocking was discontinued (WDFW 2004). Brook Trout may compete with or hybridize with Bull Trout where their distribution overlap (Rieman et al. 2006). Instances of hybridization are well documented (Nelson et al. 2011; Adams and Smith 2020) in the Wenatchee Basin and likely occur elsewhere. In addition, other invasive predators such as Walleye and Smallmouth Bass are present within the Rock Island pool and have potential to prey on juvenile or subadult Bull Trout (USFWS 2015a). Many of these non-native species were introduced to provide fishing opportunities (WDFW 2004; Sanderson et al. 2009) and are expected to further disperse into tributary habitats in response to increases in surface water temperatures driven by climate-change (Rubenson and Olden 2020).

Management

As discussed above, USFWS manages Bull Trout under the ESA. Other entities contribute to the species management by providing data, funding resources, fisheries management, and implementing conservation measures or management plans.

Recovery Plans

In 2015, USFWS issued the Recovery Plan for the Coterminous United States Population of Bull Trout (USFWS 2015a) which identifies actions USFWS believes are necessary to recover the species. The recovery plan identifies the following four general actions that are necessary for recovery in all recovery units (USFWS 2015a):

1. Protect, restore, and maintain suitable habitat conditions for Bull Trout.

2. Minimize demographic threats to Bull Trout by restoring connectivity or populations where appropriate to promote diverse life history strategies and conserve genetic diversity.
3. Prevent and reduce negative effects of non-native fishes and other non-native taxa on Bull Trout.
4. Work with partners to conduct research and monitoring to implement and evaluate Bull Trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks, and considering the effects of climate change.

The recovery plan uses recovery unit implementation plans (i.e., MCRUIP; USFWS 2015b) to communicate recommended recovery actions.

Endangered Species Act Consultations

When a federal agency's action "may affect" Bull Trout or Bull Trout critical habitat, ESA Section 7 requires the agency to consult with USFWS to determine whether the action is likely to jeopardize the continued existence of Bull Trout or to destroy or adversely modify Bull Trout critical habitat. If the action is "likely to adversely affect" Bull Trout or Bull Trout critical habitat, USFWS issues a BiOp and an incidental take statement that describes the amount or extent of anticipated incidental take that is permitted during implementation of the federal action.

FERC consulted with USFWS under ESA Section 7 on the incorporation of the Rocky Reach, Rock Island and Wells Anadromous Fish Agreements and HCPs into their respective FERC licenses. USFWS determined that continued operation of the projects under the amended licenses would not jeopardize the continued existence of Bull Trout and issued a 2004 BiOp. The opinion included conditions developed by USFWS to minimize the effect of incidental take of Bull Trout at each project (USFWS 2004). These measures, including implementation of a BTMP, continue to be implemented at Rock Island under the existing FERC license.

Since issuance of the 2004 BiOp described above, USFWS has also consulted on the issuance of new FERC licenses for the Priest Rapids (USFWS 2007), Rocky Reach (USFWS 2008b) and Wells (USFWS 2012) hydroelectric projects. All of these consultations resulted in USFWS's issuance of no-jeopardy determinations for continued operation of those projects pursuant to new FERC licenses.

More recently, the USFWS conducted a formal consultation (USFWS 2020) and issued a BiOp on the emergency implementation of an interim fish passage plan at the Rock Island Project. The interim passage plan was developed to address a dam safety incident occurring downstream at

Wanapum Dam in 2014. The safety incident at Wanapum Dam reduced the tailrace water elevation at Rock Island Dam and greatly reduced fish access to the Rock Island Fishways. Under the plan, Chelan PUD undertook a major effort to modify the Rock Island Fishways' infrastructure to promote safe passage of Bull Trout and other anadromous species while Wanapum Dam was being repaired. The USFWS BiOp concluded that the emergency implementation of an interim fish passage plan was not likely to jeopardize the continued existence of Bull Trout or adversely modify designated critical habitat.

State Fisheries Management

Within the state of Washington, harvest of Bull Trout is largely prohibited by state fishing regulations with the exception of fisheries authorized by ESA 4(d) rules. WDFW fishing regulations limit unnecessary handling of incidentally captured Bull Trout to minimize the potential for injury (WDFW 2022):

"It is unlawful to totally remove salmon, steelhead, or Dolly Varden/bull trout from the water if it is unlawful to retain those fish, or if the angler subsequently releases the salmon, steelhead, Dolly Varden/bull trout."

Indirectly, other state fishery regulations may impact Bull Trout, particularly those that limit the harvest of invasive predators. Upstream of Chief Joseph Dam, catch limits allow the retention of only one Smallmouth Bass over 14 in. in length and one Walleye over 22 in. in length (WDFW 2022). These regulations protect the largest and most fecund predators and may contribute to the production of juvenile recruits that are potentially entrained into Bull Trout habitats downstream (McMichael et al. 2021) including the Rock Island Project. In contrast, the fishing regulations within the Columbia River downstream of Chief Joseph Dam, encompassing the Rock Island Project Reservoir, have no size restriction or daily limit for Smallmouth Bass or Walleye (WDFW 2022) and therefore allow more harvest opportunities on invasive predator populations.

Chelan PUD HCP License Commitments

Chelan PUD contributes to Bull Trout management through the implementation of the Rock Island and Rocky Reach HCPs (Chelan PUD 2002a, 2002b). Achievement of the HCP standards discussed in early chapters and implementation of Survival Plan measures such as spill and predator control are expected to increase Bull Trout survival also. The HCPs' Tributary Conservation Plan provides funding for improving habitat conditions in tributaries including those critical to Bull Trout recovery such as the Wenatchee, Entiat, and Methow River basins. Finally, the HCPs' Hatchery Compensation Plan provides funding for hatchery production of Plan Species at tributary and mainstem locations. The current hatchery production target for Chelan PUD's Hatchery Compensation Plan is about 1.5 million juvenile salmon and steelhead. These fish contribute to

the conservation of Plan Species but also provide an important prey source for Bull Trout (USFWS 2015b).

Chelan PUD Rock Island Bull Trout FERC License Commitments

As noted above, USFWS issued a no-jeopardy BiOp and incidental take statement with regard to FERC's incorporation of the Rock Island HCP into the Rock Island Project license. In doing so, FERC adopted USFWS's conditions to minimize the effect of incidental take of Bull Trout. These included both impact minimization measures proposed by Chelan PUD and RPMs identified by USFWS in the BiOp (USFWS 2004). The impact minimization measures proposed by Chelan PUD for the Rock Island Project included (USFWS 2004):

- Implement a comprehensive BTMP that covers the Rock Island Project area;
- Conduct juvenile passage monitoring including monthly passage trends and counts of passage events in the adult fishways;
- Conduct adult passage monitoring including counts and an expanded period of off-season counts;
- Consider tributary enhancements to move large woody debris from the Rock Island Project to tributary locations; and
- Continue involvement in recovery plan meetings and address uncertainties on project effects that are outlined in the recovery plan.

The RPMs for Rock Island Project included (USFWS 2004):

RPM 1: *FERC shall require the licensee to develop and implement, in coordination with the Service, appropriate measures to reduce impediments to up and downstream passage of adult and juvenile Bull Trout at Rock Island Dam and its associated reservoir system*.

RPM 2: *FERC shall require the licensee to develop a monitoring program to: 1) detect adverse effects resulting from the proposed action; 2) assess the actual level of incidental take in comparison with the anticipated incidental take level documented in the BiOp; 3) detect when the level of anticipated incidental take is exceeded; and 4) determine the effectiveness of reasonable and prudent measures and their implementing terms and conditions. Specifically, the program shall be designed to monitor the abundance, distribution, and timing of adult and juvenile Bull Trout utilizing Rock Island Dams and its associated reservoir systems.*

Chelan PUD subsequently developed the Rock Island BTMP (Chelan PUD 2005) to implement the proposed impact minimization measures and satisfy requirements of the RPMs identified in the

HCP consultation BiOp (USFWS 2004).The Rock Island BTMP (Chelan PUD 2005) focuses on three specific elements:

- Identify and minimize any adverse Rock Island Project impact on adult Bull Trout passage;
- Investigate potential Rock Island Project-related impacts on upstream and downstream passage of subadult Bull Trout through the Rock Island Dam and reservoir; and
- Determine potential Bull Trout stranding or entrapment as a result of the Rock Island Project operations.

5.3.7.2 White Sturgeon

Life History

White Sturgeon are the largest freshwater fish in North America (Scott and Crossman 1973) distributed between the Fraser, Columbia, and Sacramento San Joaquin River basins (Hildebrand et al. 2016). Although some fish make excursions into marine or estuarine habitats, most White Sturgeon spend the majority of their lives in freshwater (Parsley et al. 2008). White Sturgeon are an important ecological, recreational, and cultural resource that has been exploited by Tribal, sport, and commercial fisheries since before the turn of the last century (Ptolemy and Vennesland 2003).

White Sturgeon are long-lived, late-maturing fish (Semakula and Larkin 1968) that can commonly reach lengths of 8-10 ft.[45] Male and female White Sturgeon mature at different rates with males reaching sexual maturity at about age-12 (approximately 49 in.) while females reach maturity somewhere between age-15 to 32 (greater than 65 in.) (Hildebrand et al. 2016). Once females are sexually mature, they can only spawn every 2 to 5 years (Beamesderfer et al. 1995). This gives White Sturgeon a low resiliency and high population vulnerability, with a minimum population doubling time of more than 14 years (Froese et al. 2017).

White Sturgeon prefer deep soft-bottomed habitats for feeding (Parsley et al. 2008). Adult White Sturgeon feed on fishes but also eat crustaceans, insects, mollusks, and other invertebrates, as well as eggs of other fish species. Larval and juvenile White Sturgeon rely on amphipods, mysids, isopods, and other benthic organisms. Availability of these species has been implicated in Columbia River White Sturgeon population declines with successful spawning but low recruitment (Muir et al. 2000).

[45] Historic accounts of large White Sturgeon have been reported up to 20 ft in length and 1,800 lbs. (Wydoski and Whitney 2003).

Status

The White Sturgeon is not an ESA-listed species within the Columbia River. White Sturgeon is listed as SGCN under WDFW's SWAP and as a Priority Species under the WDFW PHS (WDFW 2021b). Prior to the initiation of early engagement in this relicensing process very little was known about the status of White Sturgeon in the Rock Island Reservoir. Only one known historic population assessment was conducted in the Rock Island Reservoir; a 1998 WDFW stock assessment was performed when 95 setlines were fished and four sturgeon were captured, ranging from 56.7 in. to 75.6 in. (144-192 cm) fork length (FL) (DeVore et al. 1998 in Ward 1998). With only one sampling period and few recaptures, a population size estimate was not possible.

In order to address this information gap, a population index study was conducted in the summer and fall of 2022. This population index study used setline fishing and mark recapture population estimation methodologies. A total of 232 overnight sets resulted in 220 unique White Sturgeon captured ranging from 18.9 in. to 85.4 in. (48-217 cm) FL. The overall population abundance in the Rock Island Reservoir was estimated to be 515 with a confidence limit (CL) of 377 to 652 fish (see Appendix G.4) (Blue Leaf 2023). This population was comprised of three different origins of White Sturgeon. The largest component of the White Sturgeon population was from fish that have immigrated into Rock Island Reservoir from upstream hatchery supplementation programs in the Rocky Reach and Wells reservoirs which were initiated over the last decade. This upstream supplementation immigrant population in the Rock Island Reservoir was estimated to have an abundance of 391 (CL 287 to 495) fish. There were additional hatchery supplementation fish present in Rock Island Reservoir from the release of 20,600 age-1 sturgeon directly into Rock Island Reservoir during 2003 by the CRITFC. This CRITFC component was estimated at 54 (CL 39 to 68) fish. Finally, there was a component of wild origin sturgeon estimated at 29 (CL 9 to 49) fish.

Aging of the wild fish showed that 8 of the 15 wild fish captured were less than 11 years old and originated from at least five different year classes since 2011 suggesting some small level of natural recruitment has occurred in recent years in Rock Island Reservoir or further upstream (see Appendix G.4) (Blue Leaf 2023).

All White Sturgeon captured had DNA samples collected and processed by the CRITFC Hagerman Genetics Lab. Of the 15 wild-origin samples processed only two were full-siblings and there were no half-siblings. The only other genetic relationship identified was between one 2015-year class wild-origin fish from this study and a wild-origin adult captured in Rocky Reach Reservoir in 2014 that are half-siblings. The limited genetic relationships between wild-origin White Sturgeon captured indicate there are enough wild-origin fish spawning successfully within or upstream of the Rock Island Reservoir. The half-sibling relationship identified between a wild-origin adult captured in Rocky Reach in 2014 (219 cm FL) and a 2015 year-class (57 cm FL) White Sturgeon

from this study suggests a successful spawning event in Rocky Reach in 2015 followed by emigration into the Rock Island Reservoir. The Hagerman Lab has a well-constructed population assignment to Lake Roosevelt origin White Sturgeon, so dispersal from Lake Roosevelt can likely be ruled out. Wild-origin White Sturgeon captured from the Rock Island Reservoir did not have any confirmed genetic relationship to CRITFC-origin White Sturgeon at this time. However, the parentage of the CRITFC-origin fish is incomplete and a reconstruction from available samples (i.e., additional samples could change the reconstructed parentage) is ongoing. As such, the possibility of CRITFC-origin contribution to Rock Island Reservoir spawning events in the past or future still exists.

Periodic investigations into spawning activity in the Rock Island tailrace have also been conducted by Grant PUD, with four separate egg mat collection efforts occurring from 2010 to 2020. All four efforts have detected successful White Sturgeon spawning, comprised of multiple annual spawning events, with an average of 1,042 eggs being collected across the four efforts (Golder 2011, 2014, 2016 and 2021).

Management

As described in the Status section above, the White Sturgeon is not an ESA-listed species within the Columbia River and there is no White Sturgeon management plan for the Rock Island Project. WDFW fishing regulations allow anglers to fish for White Sturgeon in the Columbia River from McNary Dam to Chief Joseph Dam, which includes the Rock Island Reservoir, in a catch-and-release only fishery. The fishery, unless specifically noted in special rules issued by WDFW, is open during game fish or salmon fishing seasons.

Near the Rock Island Project, the Mid-Columbia River Public Utility Districts implement White Sturgeon Management Plans for the Rocky Reach, Priest Rapids, and Wells Hydroelectric Projects. As part of the Rocky Reach Comprehensive White Sturgeon Management Plan, a supplementation program was initiated in 2010 in the Rocky Reach Reservoir, immediately upstream of the Rock Island Project. To date, over 35,000 age-1 White Sturgeon have been released into Rocky Reach Reservoir and current monitoring efforts estimate a population of age-2+ to be at least 7,500 individuals (Robichaud et al. 2023).

5.3.7.3 Northern Pikeminnow

Life History

Northern Pikeminnow are native to the Columbia River. They are slow-growing, long-lived predators. In summer, adult Northern Pikeminnow prefer shallow, low-velocity water in cool lakes or rivers. During the winter, they use deeper water and pools (Scott and Crossman 1973).

Spawning occurs during the summer, in shallow water areas with gravel substrate. Northern Pikeminnow are the most abundant predator on out-migrating juvenile salmonids in the Mid-Columbia River (Poe 1994, Counihan et al., 2012). Northern Pikeminnow become piscivorous on juvenile salmonids at only 11 in. in length and the predation rate on juvenile salmonids increases significantly as they grow (Petersen et al., 2001). Predation on juvenile salmonids is concentrated in tailrace areas of Mid-Columbia River dams (Zimmerman 1999).

Status

Northern Pikeminnow are not listed on any state or federal conservation or protection list in the Pacific Northwest.

Management

Northern Pikeminnow are managed by Chelan PUD under the Rocky Reach Project's Resident Fish Management Plan (Chelan PUD 2006b) under the Rock Island and Rocky Reach HCPs,[46] which includes evaluation of predator abundance, resident species composition, and presence-absence of exotic species. The next resident fish study to evaluate these populations in Rocky Reach Reservoir will take place in 2024.

To reduce and control predation on juvenile salmonids, Chelan PUD implemented a pikeminnow removal program beginning in 1994 in the Rocky Reach Reservoir, and in 1995 in the Rock Island Reservoir. Since then, Chelan PUD contracted with the USDA, Wildlife Services to employ anglers to fish for Northern Pikeminnow in both reservoirs. Fishing efforts have focused on increasing Northern Pikeminnow catch total to control the population size. Catch data and fishing methods are document and analyzed to understand the effect of these efforts on Northern Pikeminnow populations. Beginning in 2005, Chelan PUD also contracted with Columbia Research to fish for Northern Pikeminnow within the reservoirs with set lines to increase removal efforts in areas where hook and line sampling is less effective such as deepwater overwintering areas. Chelan PUD provides funding for the "Annual Pikeminnow Derby" sponsored by the East Wenatchee Rotary Club. The 2022 event marked the 30th consecutive year for the annual derby and the 27th consecutive year that Chelan PUD has provided funding.

There are three primary objectives for the Northern Pikeminnow removal program:

- Reduce the number of Northern Pikeminnow in the Rocky Reach and Rock Island tailraces and reservoirs to reduce predation on juvenile anadromous salmon and steelhead smolts;

[46] Management of Northern Pikeminnow can be found in Section 5.4.1b of the Rock Island HCP, and 5.4.1.d of the Rocky Reach HCP.

- Continue to evaluate the efficiency of angling methods and the timing of seasonal fish movement to improve harvest efficiency; and
- Continue to evaluate current and historic catch statistics to characterize effects of the removal program on Northern Pikeminnow populations in Rocky Reach and Rock Island Reservoirs.

From 2003 to 2022, the USDA removed 954,968 Northern Pikeminnow from the Rocky Reach and Rock Island reservoirs using hook and line methods. From 2005 to 2022, Columbia Research removed 449,182 Northern Pikeminnow using set lines. Since 1996, the "Annual Pikeminnow Derby" has captured 76,277 Northern Pikeminnow over 54 days of fishing. The majority of fish removed during these coordinated efforts were greater than 10 in. and capable of preying upon migrating juvenile salmonids (Chelan PUD 2023c).

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5.4 Upland Wildlife and Botanical Resources

As specified in 18 CFR § 5.6(d)(3)(v) and (vii), this section describes upland terrestrial wildlife and botanical resources, including RTE species, and their temporal and spatial distribution, known or with the potential to occur in the Rock Island Project area (Figure 3.1-1).

5.4.1 Mammals

The habitat around the Rock Island Project supports a variety of large and small mammals. A list of mammal species with the potential to occur in the area is provided in Table 5.4-1.

Table 5.4-1 Mammal Species with Potential to Occur Around the Rock Island Project

SCIENTIFIC NAME	COMMON NAME
Alces alces	Moose
Antrozous pallidus	Pallid Bat
Canis latrans	Coyote
Castor canadensis	Beaver
Cervus canadensis	Elk
Corynorhinus townsendii	Townsend's Big-eared Bat
Eptesicus fuscus	Big Brown Bat
Euderma maculatum	Spotted Bat
Felis concolor	Cougar
Lynx rufus	Bobcat
Lasionycteris noctivagans	Silver-haired Bat
Lasiurus cinereus	Hoary Bat
Lutra canadensis	River Otter
Marmota flaviventris	Yellow-bellied Marmot
Mephitis mephitis	Striped Skunk
Mustela vison	Mink
Myotis californicus	California Bat
Myotis ciliolabrum	Western Small-footed Bat
Myotis evotis	Western Long-eared Bat
Myotis lucifugus	Little Brown Bat
Myotis thysanodes	Fringed Myotis
Myotis volans	Long-legged Bat
Myotis yumanensis	Yuma Bat
Neotoma cinerea	Bushy-tailed Woodrat
Odocoileus hemionus	Mule Deer[1]
Ondatra zibethicus	Muskrat
Ovis canadensis	Bighorn Sheep[1]
Parastrellus hesperus	Canyon Bat
Perognathus parvus	Great Basin Pocket Mouse
Peromyscus maniculatus	Deer Mouse

SCIENTIFIC NAME	COMMON NAME
Procyon lotor	Raccoon
Reithrodontomys megalotis	Western Harvest Mouse
Sylvilagus nuttalli	Nuttall's Cottontail
Taxidea taxus	Badger
Thomomys talpoides	Northern Pocket Gopher

Sources: Cordell and Pope 2021; Douglas PUD 2015; NMFS 2002a; WDFW 2021a
[1]WDFW Priority Habitat & Species Program with potential to occur in the area of the Rock Island Project

5.4.1.1 Rare, Threatened, and Endangered Mammals

Federally Listed Species

In total, there are five species of mammals categorized as threatened or endangered known to inhabit the greater Chelan and Douglas counties (Table 5.4-2). These species include the federally endangered Columbia Basin pygmy rabbit (*Brachylagus idahoensis*) (USFWS 2019), federally threatened Canada lynx (*Lynx canadensis*) (USFWS 2017); federally threatened grizzly bear (*Ursus Arctos*) (USFWS 2021), the federally endangered gray wolf (*Canis lupus*) (USFWS 2022), and the federally threatened North American wolverine (*Gulo gulo luscus*). However, no federally threatened or endangered wildlife species have been recorded in the Rock Island Project area.

The nearest core habitat for the Columbia Basin pygmy rabbit[47] is located approximately 3 miles east of the Rock Island Project in the sagebrush-dominated areas of Douglas and Grant counties. Canada lynx have designated critical habitat[48] in the subalpine forest north and west of the Rock Island Project, approximately 2.5 miles northwest at its closest. The nearest grizzly bear recovery zone[49] is located in the North Cascades, considerably outside of the Rock Island Project Boundary. The North American wolverine primarily inhabits alpine and subalpine forest habitats in Washington and is unlikely to be found within the Rock Island Project Boundary.

Of those five federally listed mammal species, only one - the gray wolf - is included in the USFWS IPaC report, indicating its potential presence in the Rock Island Project Boundary (see Appendix H) (USFWS 2023a). While lone wolves have been reported throughout the Chelan and Douglas counties,[50] the closest packs to the Rock Island Project Boundary, the Teanaway and the Maverick, are located several miles away in the Wenatchee and Entiat Mountains.[51]

[47] Pygmy rabbit core habitat: https://fws.gov/species/pygmy-rabbit-brachylagus-idahoensis/map.
[48] Canada lynx designated habitat: https://fws.gov/species/canada-lynx-lynx-canadensis/map.
[49] Grizzly bear recovery zones: https://www.fws.gov/media/grizzlybeardistributionrzmap2022jpg.
[50] Wolf observations: https://wdfw.wa.gov/species-habitats/at-risk/species-recovery/gray-wolf/observations.
[51] Known gray wolf packs: https://wdfw.wa.gov/species-habitats/at-risk/species-recovery/gray-wolf/packs.

State Listed Species

In total, there are six species of mammals categorized as state threatened or endangered that are known to inhabit the greater Chelan and Douglas counties (Table 5.4-2) (WDFW 2023a). These species include the Columbia Basin pygmy rabbit (state endangered) (WDFW 2021b), Canada lynx (state threatened) (WDFW 2021c), western gray squirrel (*Sciurus griseus*) (state threatened; WDFW 2021d), gray wolf (state endangered) (WDFW 2021e), Cascade red fox (*Vulpes vulpes cascadensis*) (state endangered) (WDFW 2023b) and grizzly bear (state endangered) (WDFW 2023c).

Five species are state candidates within Chelan and Douglas counties: the Washington ground squirrel (*Urocitellus washingtoni*), Townsend big-eared bat (*Corynorhinus townsendii*), black-tailed jackrabbit (*Lepus californicus*), white-tailed jackrabbit (*Lepus townsendii*), and the North American wolverine (WDFW 2021f-2021g; WDFW 2023d-2023g).

Western EcoSystems Technology, Inc. (West, Inc.) conducted surveys for pygmy rabbit and Washington ground squirrel for the Mid-Columbia Line. No evidence of pygmy rabbits was found while the only Washington ground squirrel observation was greater than a mile from the Rock Island Project in Douglas County (Douglas PUD 2015).

No state threatened or endangered mammal species have been recorded in the Rock Island Project area. The habitat conditions are generally not suitable for any of the mammal species listed within Chelan and Douglas counties, and none of the listed mammal species are year-round residents (NMFS 2002a; V. Pope, Chelan PUD, personal communication, May 12, 2021).

Table 5.4-2 includes federal and state-listed, candidate and BLM sensitive species,[52] along with their county of occurrence.

Table 5.4-2 Listed and Candidate Mammal Species that are Known to Inhabit the Greater Chelan and Douglas Counties (with Associated Habitat)

SCIENTIFIC NAME	COMMON NAME	STATUS[1]	COUNTIES OF OCCURRENCE
Brachylagus idahoensis	Columbia Basin Pygmy Rabbit	FE, SE	Douglas (Sagebrush Flat area in southern county)
Canis lupus	Gray Wolf	FE, SE	Chelan and Douglas

[52] Criteria for determining BLM-sensitive status: https://www.blm.gov/sites/default/files/docs/2021-08/OR-P-IM-2021-004-att2.pdf.

SCIENTIFIC NAME	COMMON NAME	STATUS[1]	COUNTIES OF OCCURRENCE
Corynorhinus townsendii	Townsend Big-eared Bat	SC	Chelan and Douglas (shrubsteppe and riparian)
Gulo gulo luscus	Wolverine	SC	Chelan (in alpine and subalpine forests)
Lepus californicus	Black-tailed Jackrabbit	SC, BLM-S	Chelan and Douglas (shrubsteppe)
Lepus townsendii	White-tailed Jackrabbit	SC	Chelan and Douglas (shrubsteppe)
Lynx canadensis	Canada Lynx	FT, SE	Chelan (in the northern region of the county)
Sciurus griseus	Western Gray Squirrel	ST, BLM-S	Chelan (pine, fir and oak forests)
Urocitellus washingtoni	Washington Ground Squirrel	SC	Douglas (shrubsteppe)
Ursus arctos	Grizzly Bear[2]	FT, SE	Chelan (North Cascades Ecosystem)
Vulpes vulpes cascadensis	Cascade Red Fox	SE, BLM-S	Chelan (alpine and subalpine meadows and open forests)

Sources: BLM 2021; USFWS 2017, USFWS 2019, USFWS 2021, USFWS 2023a; WDFW 2021a-2021g, WDFW 2023a-2023g
[1]BLM-S = BLM WA Sensitive; FE = Federal Endangered; FT = Federal Threatened; SE = State Endangered; ST = State Threatened; SC = State Candidate
[2]Considered extirpated in most of the state.

5.4.1.2 Other Priority Species Lists

Data from the Washington State Department of Natural Resources (WADNR) Natural Heritage Program (WNHP), the WDFW PHS, and SWAP suggest that a couple of Priority Species may frequent the area of the Rock Island Project (WADNR 2019; WDFW 2015 and 2023g).

Excluding bats (see the Bats section below), two mammal species are known to occur: the bighorn sheep (*Ovis canadensis*) (Photo 5-1) and the mule deer (*Odocoileus hemionus*) (V. Pope, Chelan PUD, personal communication, May 12, 2021; WDFW 2023g; WADNR 2019).

Source: Specht 2021

Photo 5-1 Bighorn Sheep

Bats

The conservation and protection of 15 bat species in Washington is managed under the state of Washington Bat Conservation Plan (WDFW 2013). Bats may utilize shoreline areas along the Columbia River and its associated tributaries in the vicinity of Rock Island Project (NMFS 2002a). In 2013, visual and acoustic bat surveys were conducted by WEST, Inc. to the south of the Rock Island Project. These surveys identified 13 bat species, including Townsend's big-eared bat, which is a SGCN, WNHP, PHS and is a Washington state candidate species (Douglas PUD 2015; WADNR 2019; WDFW 2021g; WDFW 2023a and 2023g).

Table 5.4-3 provides a list of bat species, along with their respective statuses, that were identified during the 2013 Northern Mid-Columbia Joint Project surveys.

Table 5.4-3 Bat Species Identified During 2013 Wildlife Studies for the Northern Mid-Columbia Joint Project

SCIENTIFIC NAME	COMMON NAME	LISTING STATUS[1]
Antrozous pallidus	Pallid Bat	SM, WNHP, PHS
Corynorhinus townsendii	Townsend's Big-eared Bat	SC, WNHP, PHS, SGCN
Eptesicus fuscus	Big Brown Bat	WNHP, PHS
Lasionycteris noctivagans	Silver-haired Bat	WNHP, SGCN
Lasiurus cinereus	Hoary Bat	WNHP, SGCN
Myotis californicus	California Bat	WNHP, PHS
Myotis ciliolabrum	Western Small-footed Bat	SM, WNHP, PHS
Myotis evotis	Western Long-eared Bat	SM, PHS
Myotis lucifugus	Little Brown Bat	WNHP, PHS
Myotis thysanodes	Fringed myotis	SM, WNHP, PHS
Myotis Volans	Long-legged Bat	SM, WNHP, PHS
Myotis yumanensis	Yuma Bat	WNHP, PHS
Parastrellus Hesperus	Canyon Bat	SM, WNHP

Sources: Douglas PUD 2015; WDFW 2021g, WDFW 2023a and 2023g; WADNR 2019
[1]WNHP= WA Natural Heritage Program; PHS= Priority Habitat & Species Program; SC= State Candidate; SGCN= Species of Greatest Conservation Need; SM= State Monitored

In 2020 and 2021, Chelan PUD conducted spotted bat (*Euderma maculatum*) surveys for the Rocky Reach Wildlife Forum, and they were detected at a sampling station below the Rocky Reach Dam (Cordell and Pope 2021). Spotted bats are identified as SGCN under SWAP (WDFW 2023h).

5.4.2 Birds

The area of the Rock Island Project consists of diverse habitat types that support a variety of avian species. Raptors forage in and around the Rock Island Reservoir, upland game birds and songbirds occupy areas along the Rock Island Project shoreline, and waterfowl nest on islands within the Rock Island Reservoir.

Table 5.4-4 provides a list of upland gamebirds, passerines, non-passerines, and allies that have been observed in the Rock Island Project Boundary (eBird 2022).

Table 5.4-4 Upland Gamebirds, Passerines, Non-passerines, and Allies in the Rock Island Project Boundary

SCIENTIFIC NAME	COMMON NAME
PHEASANTS, GROUSE, QUAILS, AND ALLIES	
Alectoris chukar	Chukar
Bonasa umbellus	Ruffed Grouse
Callipepla californica	California Quail
Dendragapus obscurus	Dusky Grouse
Meleagris gallopavo	Wild Turkey
Phasianus colchicus	Ring-necked Pheasant
PIGEONS AND DOVES	
Columba livia	Rock Dove
Patagioenas fasciata	Band-tailed Pigeon
Streptopelia decaocto	Eurasian Collared Dove
Zenaida macroura	Mourning Dove
NIGHTJARS AND ALLIES	
Chordeiles minor	Common Nighthawk
Phalaenoptilus nuttallii	Common Poorwill
SWIFTS	
Aeronautes saxatalis	White-throated Swift
Chaetura vauxi	Vaux's Swift
Cypseloides niger	Black Swift
HUMMINGBIRDS	
Archilochus alexandri	Black-chinned Hummingbird
Calypte anna	Anna's Hummingbird
Selasphorus calliope	Calliope Hummingbird
Selasphorus rufus	Rufous Hummingbird
KINGFISHERS	
Megaceryle alcyon	Belted Kingfisher
WOODPECKERS	
Colaptes auratus	Northern Flicker
Dryobates pubescens	Downy Woodpecker
Dryobates villosus	Hairy Woodpecker
Melanerpes lewis	Lewis's Woodpecker
Picoides arcticus	Black-backed Woodpecker
Sphyrapicus nuchalis	Red-naped Sapsucker
Sphyrapicus thyroideus	Williamson's Sapsucker
GNATCATCHERS AND TYRANT FLYCATCHERS	
Contopus cooperi	Olive-Sided Flycatcher

SCIENTIFIC NAME	COMMON NAME
Contopus sordidulus	Western Wood-Pewee
Empidonax difficilis	Pacific-slope Flycatcher
Empidonax hammondii	Hammond Flycatcher
Empidonax oberholseri	Dusky Flycatcher
Empidonax traillii	Willow Flycatcher
Empidonax wrightii	Gray Flycatcher
Myiarchus cinerascens	Ash-throated Flycatcher
Polioptila caerulea	Blue-gray Gnatcatcher
Sayornis saya	Say's Phoebe
Tyrannus tyrannus	Eastern Kingbird
Tyrannus verticalis	Western Kingbird
VIREOS	
Vireo cassinii	Cassin's Vireo
Vireo gilvus	Warbling Vireo
Vireo olivaceus	Red-eyed Vireo
SHRIKES	
Lanius borealis	Northern Shrike
Lanius ludovicianus	Loggerhead Shrike
JAYS, MAGPIES, CROWS, AND RAVENS	
Aphelocoma californica	California Scrub-Jay
Corvus brachyrhynchos	American Crow
Corvus corax	Common Raven
Cyanocitta stelleri	Steller's Jay
Pica hudsonia	Black-billed Magpie
Nucifraga columbiana	Clark's Nutcracker
CHICKADEES	
Poecile atricapillus	Black-capped Chickadee
Poecile gambeli	Mountain Chickadee
Poecile rufescens	Chestnut-backed Chickadee
LARKS	
Eremophila alpestris	Horned Lark
SWALLOWS	
Hirundo rustica	Barn Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Progne subis	Purple Martin
Riparia riparia	Bank Swallow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Tachycineta bicolor	Tree Swallow
Tachycineta thalassina	Violet-green Swallow
KINGLETS	
Regulus calendula	Ruby-crowned Kinglet
Regulus satrapa	Golden-crowned Kinglet

SCIENTIFIC NAME	COMMON NAME
NUTHATCHES	
Sitta canadensis	Red-breasted Nuthatch
Sitta carolinensis	White-breasted Nuthatch
Sitta pygmaea	Pygmy Nuthatch
TREECREEPERS	
Certhia americana	Brown Creeper
WRENS	
Catherpes mexicanus	Canyon Wren
Cistothorus palustris	Marsh Wren
Salpinctes obsoletus	Rock Wren
Thryomanes bewickii	Bewick's Wren
Troglodytes aedon	House Wren
Troglodytes pacificus	Pacific Wren
DIPPERS	
Cinclus mexicanus	American Dipper
STARLINGS	
Sturnus vulgaris	European Starling
MOCKINGBIRDS AND THRASHERS	
Dumetella carolinensis	Gray Catbird
Oreoscoptes montanus	Sage Thrasher
THRUSHES AND ALLIES	
Catharus fuscescens	Veery
Catharus guttatus	Hermit Thrush
Catharus ustulatus	Swainson's Thrush
Ixoreus naevius	Varied Thrush
Myadestes townsendi	Townsend's Solitaire
Sialia Mexicana	Western Bluebird
Turdus migratorius	American Robin
WAXWINGS	
Bombycilla cedrorum	Cedar Waxwing
Bombycilla garrulus	Bohemian Waxwing
OLD AND NEW WORLD SPARROWS	
Chondestes grammacus	Lark Sparrow
Junco hyemalis	Dark-eyed Junco
Melospiza georgiana	Swamp Sparrow
Melospiza lincolnii	Lincoln's Sparrow
Melospiza melodia	Song Sparrow
Passer domesticus	House Sparrow
Passerculus sandwichensis	Savannah Sparrow
Passerella iliaca	Fox Sparrow
Pipilo maculatus	Spotted Towhee
Pooecetes gramineus	Vesper Sparrow

SCIENTIFIC NAME	COMMON NAME
Spizella breweri	Brewer's Sparrow
Spizella pallida	Clay-colored Sparrow
Spizella passerine	Chipping Sparrow
Spizelloides arborea	American Tree Sparrow
Zonotrichia albicollis	White-throated Sparrow
Zonotrichia atricapilla	Golden-crowned Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Zonotrichia querula	Harris's Sparrow
WAGTAILS AND PIPITS	
Anthus rubescens	American Pipit
FINCHES, EUPHONIAS AND ALLIES	
Acanthis flammea	Common Redpoll
Coccothraustes vespertinus	Evening Grosbeak
Haemorhous cassinii	Cassin's Finch
Haemorhous mexicanus	House Finch
Haemorhous purpureus	Purple Finch
Loxia curvirostra	Red Crossbill
Pinicola enucleator	Pine Grosbeak
Spinus pinus	Pine Siskin
Spinus psaltria	Lesser Goldfinch
Spinus tristis	American Goldfinch
YELLOW-BREASTED CHAT	
Icteria virens	Yellow-breasted Chat
TROUPIALS AND ALLIES	
Agelaius phoeniceus	Red-winged Blackbird
Euphagus cyanocephalus	Brewer's Blackbird
Icterus bullockii	Bullock's Oriole*
Molothrus ater	Brown-headed Cowbird
Sturnella neglecta	Western Meadowlark
Xanthocephalus xanthocephalus	Yellow-headed Blackbird
WARBLERS	
Cardellina pusilla	Wilson's Warbler
Geothlypis tolmiei	MacGillivray's Warbler
Geothlypis trichas	Common Yellowthroat
Leiothlypis ruficapilla	Nashville Warbler
Parkesia noveboracensis	Northern Waterthrush
Setophaga coronate	Yellow-rumped Warbler
Setophaga fusca	Blackburnian Warbler
Setophaga nigrescens	Black-throated Gray Warbler
Setophaga petechia	Yellow Warbler
Setophaga townsendi	Townsend's Warbler
Vermivora celata	Orange-crowned Warbler

SCIENTIFIC NAME	COMMON NAME
TANAGERS AND ALLIES	
Passerina amoena	Lazuli Bunting
Pheucticus melanocephalus	Black-headed Grosbeak
Piranga ludoviciana	Western Tanager

Source: eBird 2022
*Wintering migratory birds

5.4.2.1 Waterfowl and Shorebirds

Waterfowl use the Rock Island Reservoir and the surrounding habitat for foraging, nesting, and wintering. Common winter residents include American Coots (*Fulica americana*), American Wigeons (*Anas americana*), Canada Geese (*Branta canadensis*), Greater Scaup (*Aythya marila*), Lesser Scaup (*Aythya affinis*), Mallards (*Anas platyrhynchos*), and Ring-necked Ducks (*Aythya collaris*) (NMFS 2002a). Nesting waterbirds include Canada Geese (*Branta canadensis*), Common Mergansers (*Mergus merganser*), Great Blue Herons (*Ardea Herodias*), Killdeer (*Charadrius vociferus*), Mallards, and Wood Ducks (*Aix sponsa*). Refer to Table 5.4-5 for a comprehensive list of waterbirds in the Rock Island Project Boundary, including nesting and wintering birds (eBird 2022).

Chelan PUD monitors and maintains Wood Duck nest boxes along the Rock Island Reservoir as required under Article 407 of the FERC License (FERC 1989). In 2020, during the monitoring of 81 nest boxes, 10 boxes were occupied by Wood Ducks nests, with a total of 119 eggs observed (Figure 5.4-1 and Figure 5.4-2) (Chelan PUD 2021a; Cordell and Pope 2019).

From 1975 to 2013, Chelan PUD conducted Canada Goose nesting surveys at the Rock Island Reservoir. The minimum number of Canada Goose nests recorded was 38 (in 1975 and 1979), while the maximum number of nests recorded was 178 in 1996 (Cordell-Stine and Pope 2013). Since the pool raise in 1978, the average number of Canada Goose nests along the Rock Island Reservoir has been 83 nests, compared to the pre-flood average of 44 nests (Cordell-Stine and Pope 2013).

Table 5.4-5 Waterbirds in the Rock Island Project Boundary

SCIENTIFIC NAME	COMMON NAME
DUCKS, GEESE AND WATERFOWL	
Aix sponsa	Wood Duck
Anas acuta	Northern Pintail*
Anas crecca	Green-winged Teal*
Anas platyrhynchos	Mallard
Anser albifrons	Greater White-fronted Goose*
Anser rossii	Ross's Goose*
Aythya affinis	Lesser Scaup*
Aythya americana	Redhead*
Aythya collaris	Ring-necked Duck*
Aythya marila	Greater Scaup*
Aythya valisineria	Canvasback*
Branta bernicla	Brant*
Branta canadensis	Canada Goose
Branta hutchinsii	Cackling Goose*
Bucephala albeola	Bufflehead*
Bucephala clangula	Common Goldeneye*
Bucephala islandica	Barrow's Goldeneye*
Cairina moschata	Muscovy Duck
Chen caerulescens	Snow Goose *
Clangula hyemalis	Long-tailed Duck*
Cygnus buccinator	Trumpeter Swan*
Cygnus columbianus	Tundra Swan*
Histrionicus histrionicus	Harlequin Duck*
Lophodytes cucullatus	Hooded Merganser*
Mareca americana	American Wigeon*
Mareca penelope	Eurasian Wigeon*
Mareca strepera	Gadwall*
Melanitta deglandi	White-winged Scoter*
Melanitta perspicillata	Surf Scoter*
Mergus merganser	Common Merganser
Mergus serrator	Red-breasted Merganser*
Oxyura jamaicensis	Ruddy Duck*
Spatula clypeata	Northern Shoveler*
Spatula cyanoptera	Cinnamon Teal*
Spatula discors	Blue-winged Teal*
GREBE	
Aechmophorus clarkia	Clark's Grebe*
Aechmophorus occidentalis	Western Grebe*
Podiceps auratus	Horned Grebe*
Podiceps grisegena	Red-necked Grebe*

SCIENTIFIC NAME	COMMON NAME
Podiceps nigricollis	Eared Grebe*
Podilymbus podiceps	Pied-billed Grebe*
CRANES	
Antigone canadensis	Sandhill Crane*
RAILS, GALLINULES AND COOTS	
Fulica americana	American Coot
Porzana Carolina	Sora
Rallus limicola	Virginia Rail
STILTS AND AVOCETS	
Himantopus mexicanus	Black-necked Stilt*
Recurvirostra americana	American Avocet *
PLOVERS AND LAPWINGS	
Charadrius vociferus	Killdeer
Pluvialis squatarola	Black-bellied Plover*
SANDPIPERS AND ALLIES	
Actitis macularius	Spotted Sandpiper
Calidris alba	Sanderling*
Calidris alpina	Dunlin*
Calidris bairdii	Baird's Sandpiper*
Calidris himantopus	Stilt Sandpiper *
Calidris mauri	Western Sandpiper*
Calidris melanotos	Pectoral Sandpiper*
Calidris minutilla	Least Sandpiper*
Calidris pusilla	Semipalmated Sandpiper*
Gallinago delicata	Wilson's Snipe*
Limnodromus griseus	Short-billed Dowitcher*
Limnodromus scolopaceus	Long-billed Dowitcher*
Numenius phaeopus	Whimbrel*
Phalaropus lobatus	Red-necked Phalarope*
Tringa flavipes	Lesser Yellowlegs*
Tringa melanoleuca	Greater Yellowlegs*
Tringa solitaria	Solitary Sandpiper*
GULLS, TERNS, JAEGERS, AND SKIMMERS	
Chlidonias niger	Black Tern*
Chroicocephalus philadelphia	Bonaparte's Gull*
Hydroprogne caspia	Caspian Tern
Larus argentatus	Herring Gull*
Larus brachyrhynchus	Short-billed Gull*
Larus californicus	California Gull
Larus delawarensis	Ring-billed Gull
Larus fuscus	Lesser Black-backed Gull
Larus glaucescens	Glaucous-winged Gull*

SCIENTIFIC NAME	COMMON NAME
Larus glaucoides	Iceland Gull*
Leucophaeus pipixcan	Franklin's Gull
Parasitic Jaeger	Parasitic Jaeger*
Sterna forsteri	Forester's Tern*
Sterna hirundo	Common Tern*
Xema sabini	Sabine's Gull*
LOONS	
Gavia adamsii	Yellow-billed Loon*
Gavia immer	Common Loon
Gavia pacifica	Pacific Loon*
Gavia stellata	Red-throated Loon*
CORMORANTS	
Phalacrocorax auratus	Double-crested Cormorant
PELICANS	
Pelecanus erythrorhynchos	American White Pelican
HERONS, EGRETS AND BITTERNS	
Ardea alba	Great Egret
Ardea Herodias	Great Blue Heron
Butorides virescens	Green Heron
Nycticorax nycticorax	Black-crowned Night Heron

Source: eBird 2022
*Wintering migratory birds

Figure 5.4-1 Wood Duck Boxes Within or Near the Rock Island Project Boundary (1 of 2)

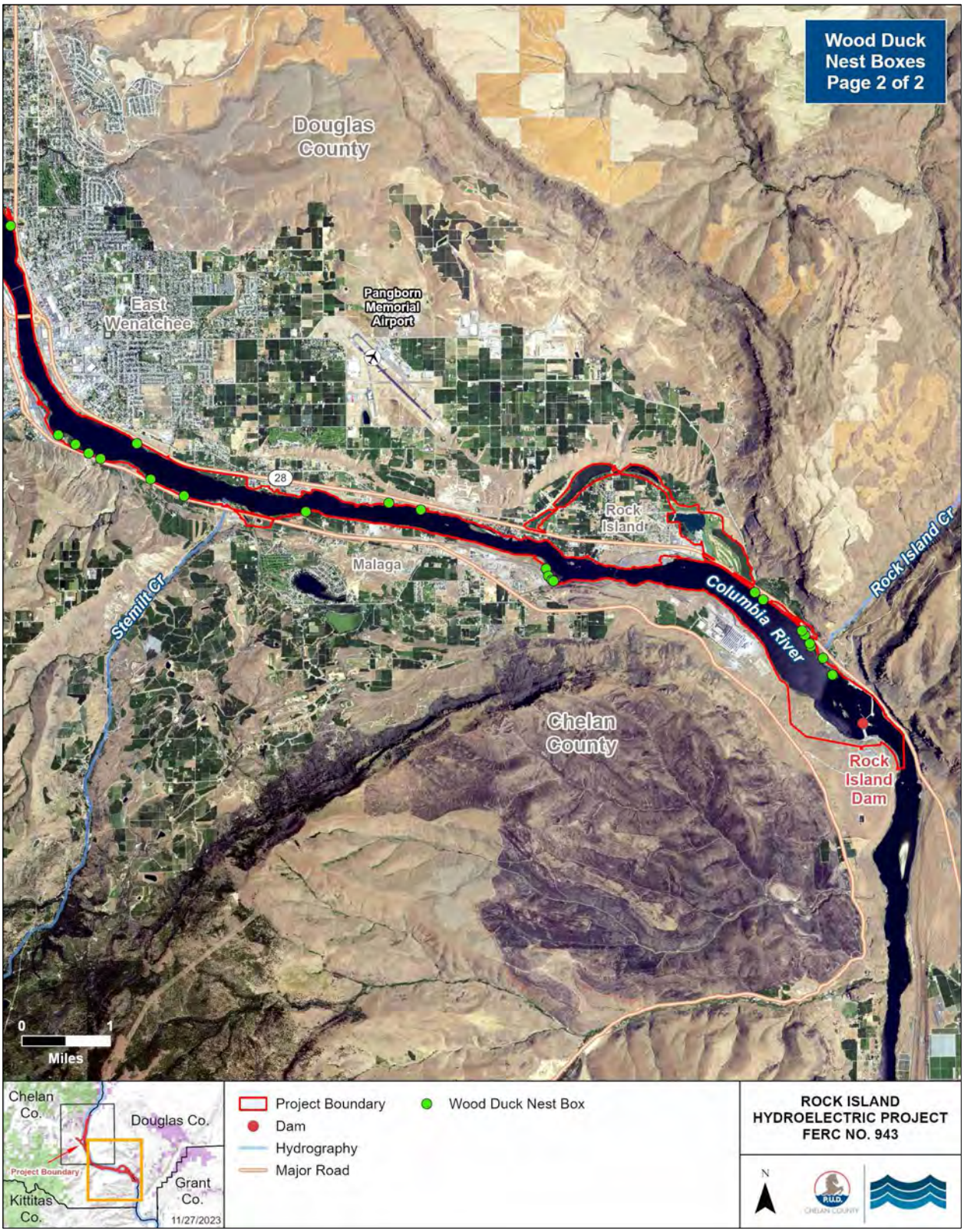


Figure 5.4-2 Wood Duck Boxes Within or Near the Rock Island Project Boundary (2 of 2)

5.4.2.2 Piscivorous Birds

The Rock Island HCP (NMFS 2002b) requires Chelan PUD to conduct control efforts for piscivorous bird populations to protect juvenile Plan Species (see Appendix E.4) (Chelan PUD 2023a). Between 2002 and 2004, Chelan PUD partnered with the University of Washington (UW) to study piscivorous birds at the Rock Island and Rocky Reach dams (Parrish 2006). The purpose of the study was to understand the impacts of piscivorous bird on salmonid smolts and identify management options within the Rock Island and Rocky Reach projects. The study effort focused on five piscivorous bird species known to frequent the Mid-Columbia River and prey on salmon smolt: Ring-billed Gulls (*Larus delawarensis*), California Gulls (*Larus californius*), Double-crested Cormorants (*Phalacrocorax auritus*), Caspian Terns (*Sterna caspia*), and Common Mergansers. While 15 species of piscivorous birds were sighted over 3 years of surveys, gulls and Common Mergansers accounted for almost 85 percent of all sightings (Parrish 2006). Thirty different species of fish, including four salmonoids, were found in the stomachs of birds taken from the study area. Overall, piscivorous birds removed less than 1 percent of the estimated salmon smolt populations (by species) moving through the study area (Parrish 2006).

The majority of avian predation (over 85 percent) occurred along the reaches, away from the immediate vicinity of the dams. The results of the study suggested that avian predation on salmonid smolts was relatively low, and control efforts were successful in reducing bird abundance and foraging efforts in the tailrace at Rock Island Dam (Parrish 2006).

Based on the results of the UW study (Parrish 2006), Chelan PUD implemented several management actions to monitor and manage piscivorous birds along the Rock Island Project, including:

- Piling cap installations;
- Piscivorous bird monitoring at the Rock Island Reservoir;
- Piscivorous bird monitoring at the Rock Island Dam tailrace;
- Double-crested Cormorant roost monitoring (including annual PIT-tag recovery efforts); and
- Maintenance of the wire array in the Rock Island tailrace.

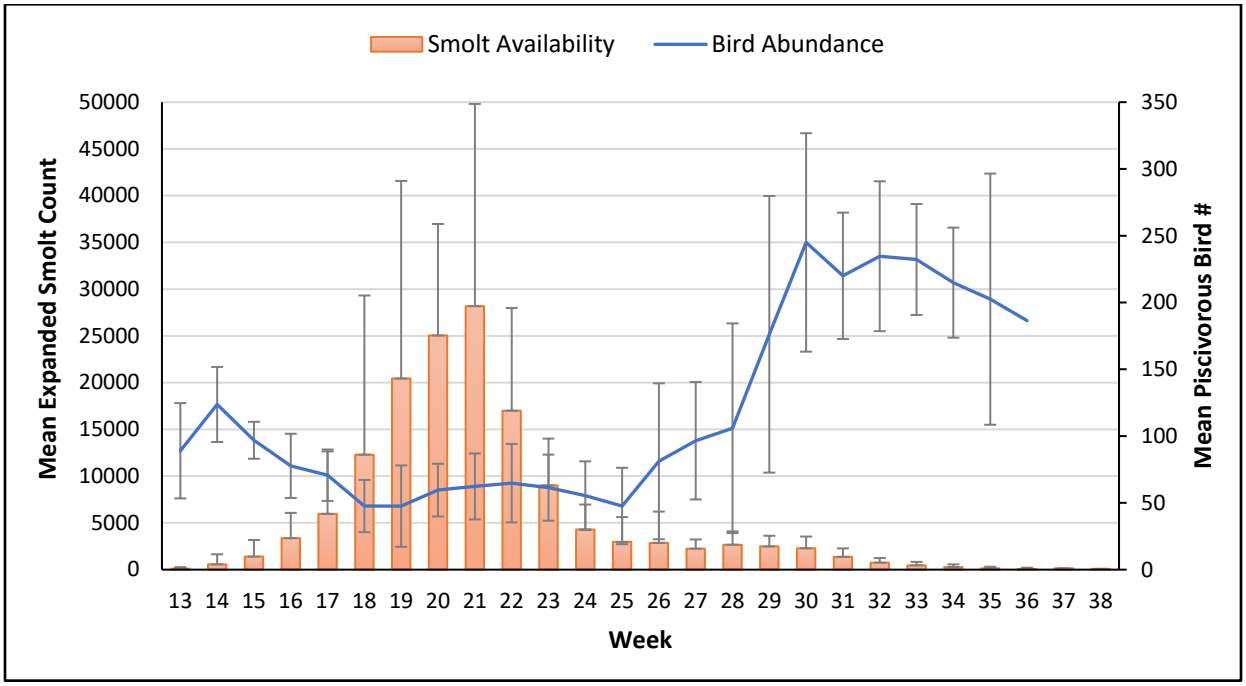
Piling Cap Installations

Parrish (2006) noted that dock and swim bay piles in Chelan PUD's parks provided a perch from which gulls and terns could forage. In 2005, Chelan PUD installed 118 piling caps on dock and swim bay pilings located in Chelan PUD's parks to deter piscivorous birds from using these sites.

Bird monitoring at the Rock Island Reservoir

Following the UW study, Chelan PUD continued the survey efforts to monitor temporal and spatial distribution of piscivorous birds from 2005 to 2018. These surveys were done on a routine basis to document piscivorous bird abundance and distribution along the Rock Island and Rocky Reach reservoirs. The species composition and temporal and spatial distribution of piscivorous birds remained very similar to results reported by Parrish (2006).

Early in the smolt migration period (April to mid-June), Common Mergansers and Double-crested Cormorants were the dominant species but occurred in relatively low numbers. During the late smolt migration period (mid-June to August) Chelan PUD recorded a 4-fold increase in piscivorous birds driven primarily by post-breeding gulls (see Appendix E.4) (Chelan PUD 2023a). While avian predation does occur at the Rock Island Project, the overall effect is relatively small since few avian predators are present when the bulk of smolts are passing through the Rock Island Project. When gull numbers increased in July, the number available smolt decreased, resulting in limited avian predation effects on migrating smolt (Figure 5.4-3).



Source: Chelan PUD 2023a

Figure 5.4-3 Smolt Availability and Bird Abundance at the Rock Island Project, 2006 to 2018

Piscivorous Bird Abundance at the Rock Island Dam Tailrace

From 2011 to 2021, Chelan PUD monitored the presence of piscivorous birds in the Rock Island tailrace, as avian predation in the tailrace of dams is a documented occurrence (Evans et al. 2016). During the smolt migration season from 2011 to 2020, Chelan PUD conducted 1,633 daily counts

of piscivorous birds in the tailrace of Rock Island Dam and found that piscivorous bird abundance in the Rock Island tailrace is low (see Appendix E.4) (Chelan PUD 2023a). The average number of observed piscivorous birds for all years was 1.6 birds per day. The piscivorous bird species composition was similar to the reservoir surveys, including species that breed locally, such as Common Mergansers, Great Blue Herons, and Double-crested Cormorants. However, the temporal distribution of piscivorous birds in the Rock Island tailrace was opposite to the reservoir survey findings, with more piscivorous birds in the tailrace in the spring and early summer (see Appendix E.4) (Chelan PUD 2023a).

Double-crested Cormorant Roost Monitoring

Parrish (2006) noted that, although Double-crested Cormorants existed in relatively low numbers during the study, their smolt consumption rates were among the highest per bird reported for the study. As a result, Chelan PUD began to monitor the known Double-crested Cormorant colony located in the Rock Island forebay. Double-crested Cormorants have been using the lattice towers that support transmission lines in the Rock Island forebay as a night roost. The numbers of Double-crested Cormorant at this location ranged from 0 to 247 during evening roost counts (n = 230) between 2006 and 2021. Double-crested Cormorant numbers were low during the winter months and peaked in late summer (see Appendix E.4) (Chelan PUD 2023a).

This constant presence of Double-crested Cormorants in the Rock Island forebay was managed by Chelan PUD using both indirect (hazing) and direct (take) methods. Indirect methods included hazing with cracker shells and propane cannons and placing perch deterrents on the towers. Chelan PUD also contracted with the USDA Wildlife Services to conduct lethal control in conjunction with federal take permits. Between 2006 and 2021, the USDA lethally removed 1,643 Double-crested Cormorants from the Rock Island forebay. This removal was aimed at reducing nesting attempts in the lattice transmission towers and smolt predation.

In addition to Double-crested Cormorants, Great Blue Herons also used the lattice towers in the Rock Island forebay as a nesting colony. The combination of roosting/nesting cormorants and Great Blue Herons constitutes a waterbird colony where PIT-tags from PIT-tagged fish eaten by piscivorous birds from the colony may be deposited. From 2007 to 2021, Chelan PUD recovered and/or read 9,633 PIT-tags on the islands in the Rock Island forebay with lattice towers (see Appendix E.4) (Chelan PUD 2023a).

Maintenance of the Wire Array in the Rock Island Tailrace

One of the tools implemented was an aggressive predator control program for piscivorous bird populations to reduce mortality to smolts from avian foraging during the outmigration season (see Appendix E.4) (Chelan PUD 2023a). Specifically, piscivorous birds, which include Caspian Terns,

Double-crested Cormorants, and various gull species, were hazed through techniques including wire arrays in the tailrace, propane cannons, pyrotechnics, lethal control and perching deterrents. The wire array, as shown in Photo 5-2, is designed to deter plunge foraging on smolts by piscivorous birds (i.e., gulls and terns) in the Rock Island Project tailrace.

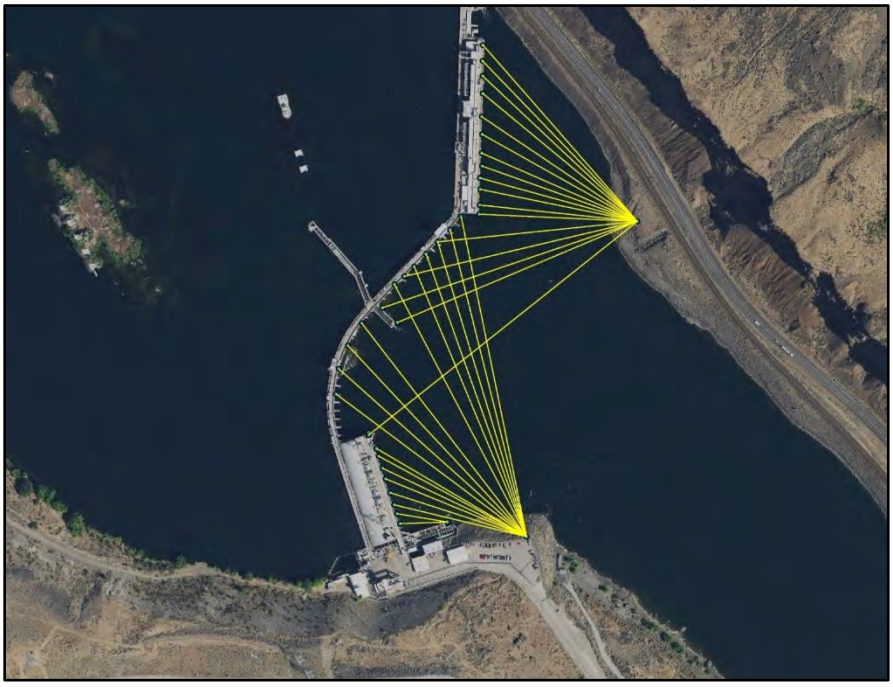


Photo 5-2 Bird Wire Array at the Rock Island Tailrace.

5.4.2.3 Raptors and Allies

In 2013, an aerial raptor nest survey was conducted in the vicinity of the Rock Island Project. The survey was conducted within 2 miles of the river near the Rock Island Dam. Ten active (occupied) raptor nests were located, including eight Red-tailed Hawk (*Buteo jamaicensis*) nests, one Golden Eagle (*Aquila chrysaetos*) nest, and one Prairie Falcon (*Falco mexicanus*) nest. Four inactive Golden Eagle nests and 21 other inactive nests of other raptor and/or corvid species were also located and mapped. Nearly all the nests observed were located along the Columbia River and its tributaries (Douglas PUD 2015).

Bald Eagle (*Haliaeetus leucocephalus*), Golden Eagle and Osprey (*Pandion haliaetus*) are known to nest along the banks of Columbia River. Chelan PUD opportunistically monitors eagle and osprey nests within or near the Rock Island Project Boundary and many of those nests were found to be occupied (Chelan PUD 2021b) (Figure 5.4-4 and Figure 5.4-5).[53]

[53] Nests of other raptor species may occur within the Rock Island Project Boundary.

Table 5.4-6 provides a list of raptors and allies in the Rock Island Project Boundary.

Table 5.4-6 Raptors and Allies in the Rock Island Project Boundary

SCIENTIFIC NAME	COMMON NAME
EAGLES, HAWKS, OSPREY AND ALLIES	
Accipiter cooperii	Cooper's Hawk
Accipiter gentilis	Northern Goshawk
Accipiter striatus	Sharp-shinned Hawk
Aquila chrysaetos	Golden Eagle
Buteo jamaicensis	Red-tailed Hawk
Buteo lagopus	Rough-legged Hawk*
Buteo swainsoni	Swainson's Hawk
Cathartes aura	Turkey Vulture
Circus hudsonius	Northern Harrier
Haliaeetus leucocephalus	Bald Eagle
Pandion haliaetus	Osprey
FALCONS	
Falco columbarius	Merlin*
Falco mexicanus	Prairie Falcon
Falco peregrinus	Peregrine Falcon
Falco sparverius	American Kestrel
OWLS	
Aegolius acadicus	Northern Saw-whet Owl
Asio flammeus	Short-eared Owl
Bubo virginianus	Great Horned Owl
Glaucidium gnoma	Northern Pygmy-Owl*
Megascops kennicottii	Western Screech Owl
Strix varia	Barred Owl*
Tyto alba	Barn Owl

Source: eBird 2022
*Wintering migratory birds

Figure 5.4-4 Raptor Nest Locations Within or Near the Rock Island Project Boundary (1 of 2)

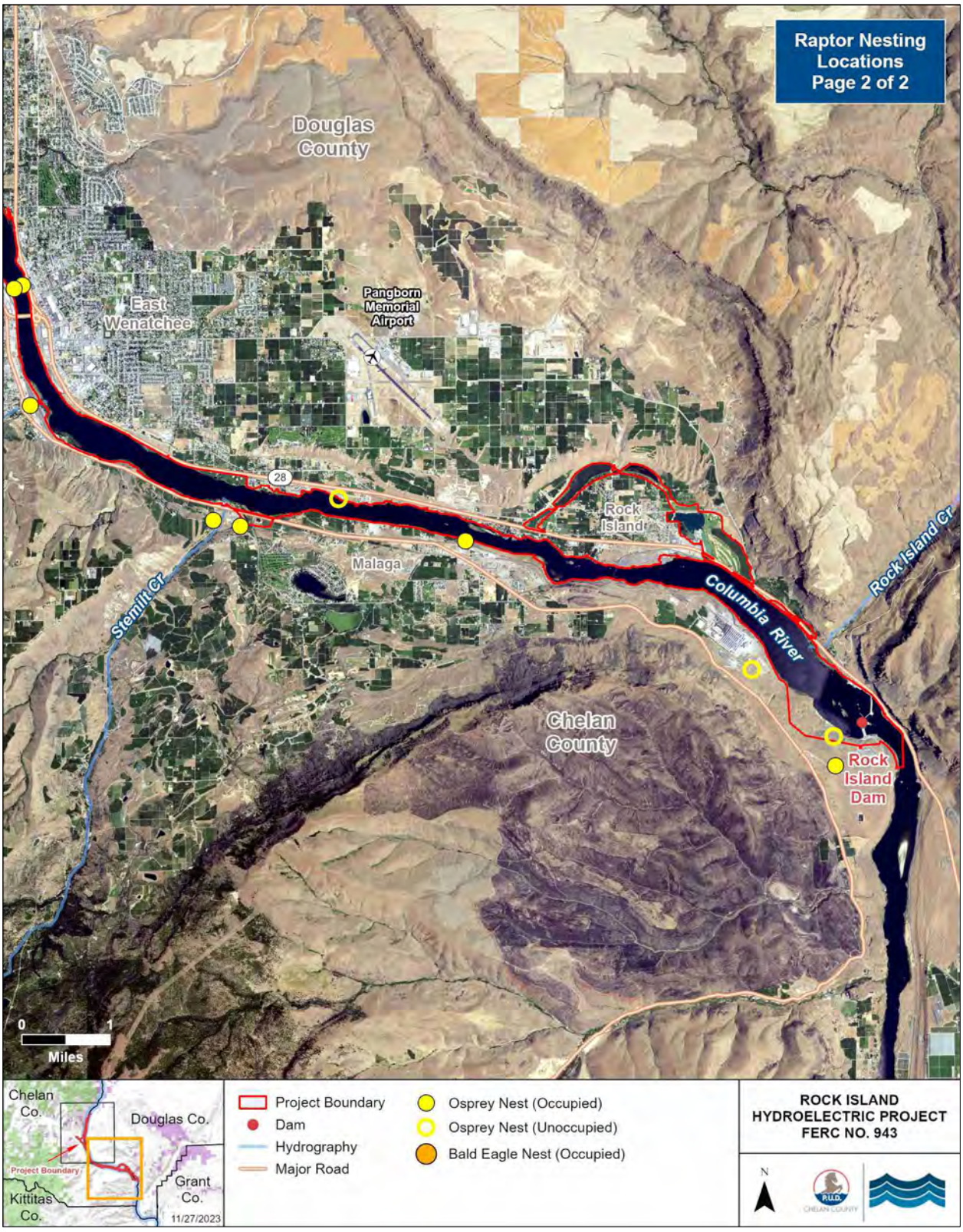


Figure 5.4-5 Raptor Nest Locations Within or Near the Rock Island Project Boundary (2 of 2)

5.4.2.4 Rare, Threatened, and Endangered Birds

Three federal laws protect a large number of native avian species and prohibit "taking" them. The Migratory Bird Treaty Act (MBTA) protects over 1,000 species of native North American migratory birds. The Bald and Golden Eagle Protection Act (BGEPA) protects both Bald Eagles and Golden Eagles. The ESA applies to species that are federally listed.

Chelan PUD has an Avian Protection Plan (APP)[54] that was developed in 2005 and updated in 2020, consistent with the USFWS guidance. The purpose of Chelan PUD's APP is to reduce risks to avian species that can result from electrocutions and collision with powerlines and equipment. Electrocution is a particular threat to birds with large wingspans, such as eagles, hawks and owls, and other species protected under the MBTA and BGEPA. Over the last 20 years, Chelan PUD has taken a variety of actions to minimize avian electrocution risk on the lattice towers in the Rock Island forebay, using design retrofits and deterrents. Chelan PUD continues to diligently implement the APP and assess opportunities to minimize avian impacts and improve system reliability.

Since the early 2000s, the transmission structures in the Rock Island forebay have been retrofitted several times to reduce outages related to bird use on these lattice tower structures. First, before 2005, the center phase jumper was moved to cross over the structure, rather than passing through the center, as originally designed. Around 2005, plastic spike strips (3-inch spikes) were added to deter birds from perching on the structures. However, the spike strips only lasted a few years before the fasteners failed, and they began to fall off. In 2017, perch deterrents (18-inch spikes) were placed in select locations on the towers to discourage cormorants from perching. These devices proved ineffective at keeping the cormorants off the towers. In 2018, additional perch deterrents were installed on the remaining uncovered portions of the top area of all transmission towers.

Due to a high frequency of outages (20) expected to be associated with cormorants and herons between 2015 and 2017, the center phase conductor was moved back to its original configuration, passing through the towers rather than over them, and guano shields were added to the center phase insulators to protect the insulator from bird guano. However, in 2019, the perch deterrents were removed since they actually facilitated nest building and bird presences in the towers. Since their removal, cormorant nesting in the towers has declined significantly.

[54] Available online: https://www.chelanpud.org/docs/default-source/default-document-library/avian-protection-plan-updated-2023.pdf.

Federally Listed Species

The Northern Spotted Owl (*Strix occidentalis caurina*) and the Yellow-billed Cuckoo (*Coccyzus americanus*) are federally listed as threatened. However, these species are not known to occur locally. The Northern Spotted Owl inhabits conifer forests, and the closest critical habitat[55] is located more than 6 miles west of the Rock Island Project. The nearest Yellow-billed Cuckoo critical habitat[56] is located in southeast Idaho, approximately 470 miles southeast of the Rock Island Project.

Only the Yellow-billed Cuckoo is included in USFWS IPaC report for the Rock Island Project Boundary (USFWS 2023a). Nevertheless, the Yellow-billed Cuckoo is now functionally considered extirpated in Washington state (WDFW 2023i).

State Listed Species

Washington state-listed bird species in Chelan and Douglas counties include the Northern Spotted Owl (state endangered), Ferruginous Hawk (*Buteo regalis*) (state endangered), and the Yellow-billed Cuckoo (state endangered) (WDFW 2021a and 2023a). Additionally, there are two state-sensitive species, the American White Pelican (*Pelacanus erythrorhynchos*) and the Common Loon (*Gavia immer*) (WDFW 2023j and 2023k).

Several Washington state candidate species of birds are found within the two counties, including the Western Grebe (*Aechmophorus occidentalis*), Clark's Grebe (*Aechmophorus clarkia*), Northern Goshawk (*Accipiter gentilis*), Golden Eagle, Flammulated Owl (*Psiloscops flammeolus*), Burrowing Owl (*Athene cunicularia*), White-headed Woodpecker (*Picoides albolarvatus*), Black-backed Woodpecker (*Picoides arcticus*), Loggerhead Shrike (*Lanius ludovicianus*), Sage Thrasher (*Oreoscoptes montanus*) and Sagebrush Sparrow (*Artemisiospiza nevadensis*) (WDFW 2023a).

Table 5.4-7 summarizes federal and state-listed and candidate bird species that may be found in the greater Chelan and Douglas counties. Of these, only the Common Loon and the American White Pelican have been observed within the Rock Island Project Boundary (eBird 2022).

[55] Northern Spotted Owl critical habitat: https://ecos.fws.gov/ecp/species/1123#crithab.
[56] Yellow-billed Cuckoo critical habitat: https://ecos.fws.gov/ecp/species/3911#crithab.

Table 5.4-7 Federal and State Listed Bird Species Potentially Present in Chelan and Douglas Counties (with Associated Habitat)

SCIENTIFIC NAME	COMMON NAME	STATUS[1]	COUNTIES OF POTENTIAL OCCURRENCE
Buteo regalis	Ferruginous Hawk	SE, BLM-S	Douglas (shrubsteppe)
Centrocercus urophasianus	Greater Sage-grouse	SE, BLM-S	Douglas (shrubsteppe)
Coccyzus americanus	Yellow-billed Cuckoo*	FT, SE, BLM-S	Chelan and Douglas (riparian)
Gavia immer	Common Loon	SS, BLM-S	Chelan and Douglas (freshwater lakes/reservoirs, marine shorelines)
Pelecanus erythrorhynchos	American White Pelican	SS, BLM-S	Chelan and Douglas (rivers, marine shorelines)
Strix occidentalis caurina	Northern Spotted Owl**	FT, SE, BLM-S	Chelan (coniferous forests, east slope of Cascade Range)
Tympanuchus phasianellus	Columbian Sharp-tailed Grouse	SE, BLM-S	Chelan and Douglas (shrubsteppe, riparian)

Sources: BLM 2021; USFWS 2023a; WDFW 2023a and 2023g
[1] BLM-S = BLM WA Sensitive; FT = Federal Threatened; SE = State Endangered; ST = State Threatened; SS = State Sensitive
*Very rare migrant; considered extirpated in WA
**Uncommon

5.4.2.5 Other Priority Species Lists

Several species of birds known to occur in the Rock Island Project Boundary are identified in the WNHP, PHS and/or SGCN lists. These birds include Wood Duck, Chukar (*Alectoris chukar*), Golden Eagle, Great Blue Heron, Peregrine Falcon (*Falco peregrinus*), Bald Eagle, and Osprey, American White Pelican, Clark's Grebe, Western grebe, Common Loon, Black-crowned Night-heron (*Nycticorax nycticorax*), Bufflehead (*Bucephala albeola*), Common Goldeneye (*Bucephala clangula*), Barrow's Goldeneye (*Bucephala islandica*), Tundra Swan (*Cygnus columbianus*), Prairie Falcon, Northern Goshawk, Ring-necked Pheasant (*Phasianus colchicus*), Black-necked Stilts (*Himantopus mexicanus*), American Avocets (*Recurvirostra americana*), Vaux's Swift (*Chaetura vauxi*), Black-backed Woodpecker, Loggerhead Shrike, and Sage Thrasher (eBird 2022; WADNR 2019; WDFW 2023g).

5.4.3 Reptiles and Amphibians

Amphibians in the Rock Island Project Boundary may use shallow backwater areas and temporary pool habitat. Some of the reptile species observed in the Rock Island Project Boundary are associated with wetlands (i.e., painted turtles [*Chrysemys picta*]) whereas others are more

commonly found along rocky shorelines (i.e., rubber boas (*Charina bottae*) (NMFS 2002a), including the HNA. Table 5.4-8 provides a list of amphibians and reptiles that are known to occur in Chelan and Douglas counties.

Table 5.4-8 Amphibians and Reptiles Present in Chelan and Douglas Counties

SCIENTIFIC NAME	COMMON NAME
Ambystoma macrodactylum	Long-toed Salamander
Anaxyrus boreas	Western Toad
Charina bottae	Rubber Boa
Chrysemys picta	Painted Turtle
Crotalus viridis	Western Rattlesnake
Eumeces skiltonianus	Western Skink
Hyla regilla	Pacific Treefrog
Pituophis catenifer	Gopher Snake
Rana catesbiana	American Bullfrog
Rana luteiventris	Columbia Spotted Frog
Scaphiopus intermontanus	Great Basin Spadefoot
Sceloporus occidentalis	Western Fence Lizard
Thamnophis elegans	Western Terrestrial Garter Snake
Thamnophis sirtalis	Common Garter Snake

Sources: NMFS 2002a; WA Herp Atlas 2009; WDFW 2021a

5.4.3.1 Rare, Threatened and Endangered Amphibians and Reptiles

There are no federal or state threatened or endangered amphibian and reptile species known to occur in the Rock Island Project Boundary, and none are included in USFWS IPaC report (USFWS 2023a). However, there are four state candidate species that occur in Chelan and Douglas counties. They include the western toad (*Anaxyrus boreas*), the Columbia spotted frog (*Rana luteiventris*), the sharp-tailed snake (*Contia tenuis*), and the northern sagebrush lizard (*Sceloporus graciosus*) (WA Herp Atlas 2009; WDFW 2021a and 2023a).

5.4.3.2 Other Priority Habitat and Species

The western toad, Columbia spotted frog, northern sagebrush lizard and sharp-tailed snake are all designated as SGCN and are part of the WNHP and/or the PHS lists (WADNR 2019; WA Herp Atlas 2009; WDFW 2021a and 2023g).

5.4.4 Invertebrates

The Monarch butterfly (*Danaus plexippus*) is a federal candidate species that may be found in and near the Rock Island Project. It is included in the USFWS IPaC report (USFWS 2023a; WDFW 2023l) and identified as a SGCN and part of the WNHP list (WADNR 2019; WDFW 2021a and 2023g). In

Washington, Monarch butterflies are found east of the Cascades where showy milkweed (*Asclepias speciosa*) occurs. Monarchs do not overwinter in the state but can be found along the major river courses of the Columbia and Snake rivers during their southward migration.

5.4.5 Introduced Wildlife Species

Introduced bird species observed in the area of the Rock Island Project include European Starlings (*Sturnus vulgaris*), Rock Doves (*Columba livia*), English Sparrows (*Passer domesticus*), and Eurasian Collared doves (*Streptopelia decaocto*) (V. Pope, Chelan PUD, personal communication, May 21, 2021).

It is likely that introduced amphibians, such as the American bullfrog (*Rana catesbeiana*), are present in the Rock Island Project Boundary (V. Pope, Chelan PUD, personal communication, May 21, 2021). American bullfrogs are invasive in Washington and are listed as a "Priority Species" by the Washington Invasive Species Council (WSRCO 2023). Native to the eastern United States and Canada, the American bullfrog's presence in the region has led to the decline of native amphibian species in Washington.

Painted turtles, while native to Washington, do not naturally occur in this stretch of the Columbia River. However, they are present in the Rock Island Project Boundary in areas with a ponded environment, which the turtles prefer (V. Pope, Chelan PUD, personal communication, May 21, 2021).

Eastern gray squirrels have recently invaded the Wenatchee and East Wenatchee areas, resulting in a significant increase in wildlife-related power outages caused by these introduced squirrels (V. Pope, personal communication, August 9, 2022).

5.4.6 Upland Habitat and Botanical Resources

The Rock Island Project lies within the East Cascades Physiographic Province (Franklin and Dyrness 1973). This physiological province is dominated by a "big sagebrush/bluebunch wheatgrass or shrubsteppe vegetation zone."

Most of the Columbia River in eastern Washington, including the portion occupying the Rock Island Project area, is associated with the *Artemisia/Agropyron* community. This community occupies the center of the Columbia Basin Province and extends to the foothills of the Cascade Range below transitional pine zone habitat. Within the Rock Island Project area, this community extends from the uplands to the shorelines of the reservoir, and in areas of riparian or wetland habitats, this community is found immediately upland of these habitats.

Its primary components include the following:

- A shrub layer composed principally of basin big sagebrush, other Artemisia species, and bitterbrush. Other shrubs dominating this layer include rabbitbrush (*Chrysothamnus* spp.), serviceberry (*Amelanchier alnifolia*), blue elderberry (*Sambucus cerulea*), and mock orange (*Philadelphus lewisii*);
- A layer of caespitose perennial grasses dominated by bluebunch wheatgrass and other wheatgrasses (*Agropyron* and *Elymus* spp.), needlegrasses (Stipa spp.), Great Basin wildrye (*Leymus cinerus*), Indian ricegrass, Sandberg bluegrass (*Poa secunda*), and squirreltail (*Sitanion hystrix*);
- Perennial forbs adapted to the dry climate such as arrowleaf balsamroot (*Balsamorhiza sagittata*), lupine (*Lupinus* spp.), western yarrow (*Achillea millefolium*), and buckwheats (*Eriogonum* spp.);
- A layer of annual and perennial forbs and grasses within 4 in. of the soil surface, including species such as large-flowered collomia (*Collomia grandiflora*), small-flower blue-eyed Mary (*Collinsia parviflora*), Nuttall's larkspur (*Delphinium nuttallianum*), and invasive grasses such as cheatgrass (*Broumus tectorum*) and bulbous bluegrass (*Poa bulbosa*); and
- A surface crust typically composed of crustose lichens and acrocarpous mosses (such as *Tortula brevipes*, *Tortula princeps*, and *Alonia rigida*) (Franklin and Dyrness 1973).

A geographic information system (GIS) analysis of NatureServe land cover data revealed that a majority of the undeveloped landcover within one-half mile of the Rock Island Project Boundary consist of sagebrush steppe, forest, shrublands and herbaceous habitat (Table 5.4-9) (NatureServe 2014). Within the Rock Island Project Boundary, there are small areas of wetland and riparian habitat located primarily along the shoreline, near the Wenatchee River confluence, and at Putters Pond, Porters Pond, and Blue Heron Pond (see Section 5.5 for more information on wetlands). The pockets of riparian communities include stands of native black cottonwood (*Populus balsamifera ssp. Trichocarpa*). These black cottonwoods exist within disjunct riparian patches between the upland agricultural and developed sites and the shoreline and in areas of undeveloped shoreline. A total of 139 individual black cottonwood polygons were mapped on 2022 representing 89.2 acres of cottonwood stands of varying age classes within the Rock Island Project Boundary (see Appendix E.5) (Chelan PUD 2023b).

Agricultural lands are present in the area of the Rock Island Project. They are primarily located on the Columbia River's east bank (just north of East Wenatchee), on the banks of the Wenatchee River, and along the river corridor between Wenatchee/East Wenatchee and the city of Rock Island. There is also agricultural land around the city of Rock Island. Approximately 18.2 percent of the land within the Rock Island Project area is considered some degree of agricultural land

(NatureServe 2014). Notably, according to Multi-Resolution Land Characteristics (MRLC) (2016) agricultural areas include apple, pear, and cherry orchards. Aside from agricultural land, developed land, and open water, the NatureServe (2014) raster data identified 20 botanical communities within one-half mile of the Rock Island Project Boundary (Figure 5.4-6 and Figure 5.4-7). Twelve of these communities individually make up less than 1 percent of the land in that portion of the Rock Island Project.

Much of that land is developed ranging from "Developed-High Intensity" to "Developed-Open Space." The developed land cover is primarily around the communities of Wenatchee, East Wenatchee, and the city of Rock Island. Based on data from NatureServe, approximately 32 percent of the land within one-half mile of the Rock Island Project Boundary is classified as some degree of "developed" (NatureServe 2014).

Table 5.4-9 provides the approximate percentage of cover of each of the six statistically significant botanical communities and land cover types.

Table 5.4-9 Botanical Communities and Associated Land Cover Types Within 0.5 Mile of the Rock Island Project Boundary

BOTANICAL COMMUNITY	APPROXIMATE PERCENTAGE
Total Developed	32.0
Total Agriculture	18.2
Open Water	17.2
Inter-Mountain Basins Big Sagebrush Steppe	12.7
Inter-Mountain Basins Big Sagebrush Shrubland	7.5
East Cascades Transitional Pine Forest	4.4
Columbia Basin Foothill and Canyon Dry Grassland	2.4
Introduced Riparian Vegetation	1.8
Inter-Mountain Basins Cliff and Canyon	1.5
Total of "Others" with less than 1% per category	2.3
Total	100

Source: NatureServe 2014

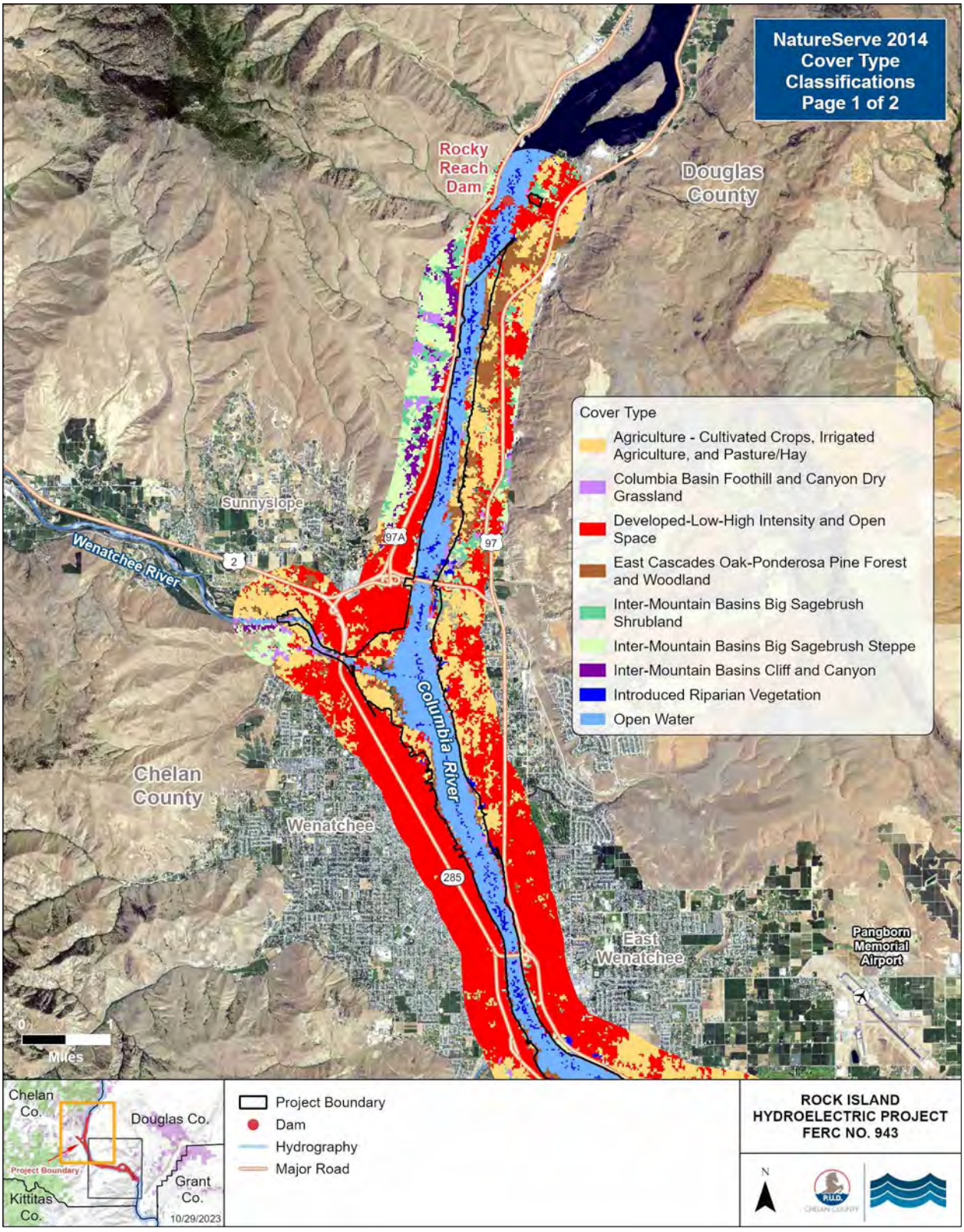


Figure 5.4-6 Cover Type Classifications in Chelan and Douglas Counties Within 0.5 Mile of the Rock Island Project Boundary

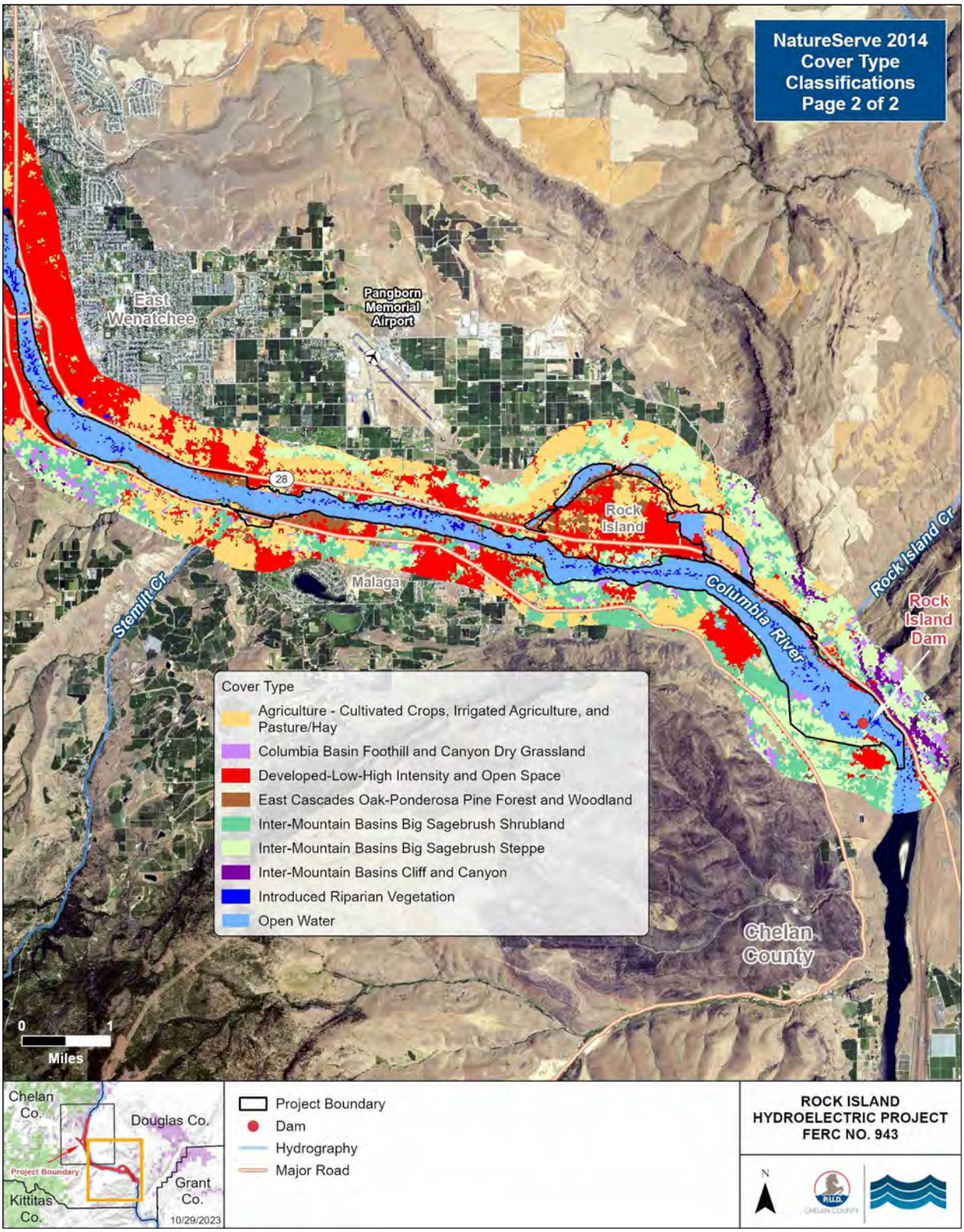


Figure 5.4-7 Cover Type Classifications in Chelan and Douglas Counties Within 0.5 Mile of the Rock Island Project Boundary

5.4.6.1 Rare, Threatened, and Endangered Plants

Federally Listed Species

A review of the 2021 Status of Federally Listed Plant Taxa in Washington State includes a federally threatened plant, the Ute ladies'-tresses (*Spiranthes diluvialis*) (ULT), which is known to occur in the Rock Island Project Boundary (see Appendices G.5 and I.1) (Beck Botanical Services 2023; USFWS 1992; WADNR 2021a). While ULT is currently listed as threatened under the ESA, USFWS recently completed a species status assessment and 5-year status review for ULT (USFWS 2023b and 2023c). USFWS recommended in the 5-year status review that ULT be delisted under the ESA due to recovery.

The USFWS IPaC report (USFWS 2023a) includes endangered showy stickseed (*Hackelia venusta*) and Wenatchee mountains checkermallow (*Sidalcea oregana var. calva*), but neither of these species were found during the most recent RTE plant surveys within the Rock Island Project Boundary (see Appendix I.1) (Beck Botanical Services 2023). Wenatchee mountains checkermallow critical habitat[57] is located more than 10 miles west of the Rock Island Project in mid-elevation wetlands and moist meadows. No critical habitat has been designated for showy stickseed (USFWS 2023a).

The Wormskiold's northern wormwood (*Artemisia borealis var. wormskioldii*) is a federal candidate that may occur within the Rock Island Boundary (WADNR n.d.) but was not found during the most recent RTE plant surveys (see Appendix I.1) (Beck Botanical Services 2023). See Table 5.4-10 for federal species status and associated habitats.

State Listed Species

A review of the 2021 Washington Vascular Plant Species of Conservation Concern list identified several RTE and sensitive plant species with the potential to be found along the Rock Island Project (WADNR 2021b). State threatened plant species are the Palouse milkvetch (*Astragalus arrectus*), pauper milkvetch (*Astragalus misellus var. pauper*), gray cryptantha (*Cryptantha leucophaea*), Wenatchee larkspur (*Delphinium viridescens*), inch-high rush (*Juncus uncialis*), Whited's fuzzytongue penstemon (*Penstemon eriantherus var. whitedii*), sticky phacelia (*Phacelia lenta*), Columbia yellowcress (*Rorippa columbiae*) and Thompson's clover (*Trifolium thompsonii*). State endangered plants species are the Wormskiold's northern wormwood, Whited's milkvetch (*Astragalus sinuatus*), showy stickseed, Rone's biscuitroot (*Lomatium roneorum*), Chelan rockmat (*Petrophyton cinerascens*), Wenatchee mountains checkermallow, ULT, and navel lichen

[57] Wenatchee mountains checkermallow critical habitat: https://ecos.fws.gov/ecp/species/7222#crithab.

(*Umbilicaria phaea var. coccinea*). See Table 5.4-10 for state species status and associated habitats.

Table 5.4-10 Plant Species of Conservation Concern Including RTE Species with Highest Potential in the Rock Island Project

SCIENTIFIC NAME	COMMON NAME	LISTING STATUS[1]	HABITAT
Anemone patens var. multifida	Pasqueflower	SS, BLM-S	Prairies, open slopes, ridges, open forests.
Artemisia borealis var. wormskioldii	Wormskiold's Northern Wormwood	FC, SE, BLM-S	Basalt, compact cobbles, near riparian areas in Columbia River Basin.
Astragalus arrectus	Palouse Milkvetch	ST, BLM-S	Grassy hillsides, sage flats, river bluffs, openings in pine forest.
Astragalus misellus var. pauper	Pauper Milkvetch	ST, BLM-S	Open ridgetops, and gentle upper slopes, rarely middle and lower slopes, mostly along the western margin of the Columbia River Basin.
Astragalus sinuatus	Whited's Milkvetch	SE, BLM-S	Rocky hillsides in shrubsteppe.
Cryptantha gracilis	Narrow-stem Cryptantha	SS, BLM-S	Basalt talus, dry rocky drainages in sagebrush habitats.
Cryptantha leucophaea	Gray Cryptantha[2]	ST, BLM-S	Sandy substrates, particularly sand dunes that have not been completely stabilized.
Cryptantha scoparia	Desert Cryptantha	SS, BLM-S	South-facing slopes and ridges, in silt and talus in shrubsteppe.
Cryptantha spiculifera	Snake River Cryptantha	SS, BLM-S	Dry open shrubsteppe areas in habitats with low vegetative cover.
Delphinium viridescens	Wenatchee Larkspur	ST, BLM-S	Moist meadows in tree thickets and coniferous forests, springs, seeps, riparian areas.
Eremogone franklinii var. thompsonii	Thompson's Sandwort	SS	Low elevation, stabilized to partially stabilized sand dunes.
Eremothera pygmaea	Dwarf Mooncup	SS, BLM-S	Unstable soil in steep talus, dry washes, roadcuts; in shrubsteppe.
Erythranthe suksdorfii	Suksdorf's Monkeyflower	SS, BLM-S	Open moist to dry habitats, vernal pools, swales, in shrubsteppe
Githopsis specularioides	Common Bluecup	SS, BLM-S	Low elevation, dry open places, balds, talus, gravelly prairies.
Hackelia hispida var. disjuncta	Sagebrush Stickseed	SS, BLM-S	Basalt talus, cliffs, outcrops; sparely vegetated dry sites.
Hackelia venusta	Showy Stickseed	FE, SE	Cliffs, canyons and bedrock.

SCIENTIFIC NAME	COMMON NAME	LISTING STATUS[1]	HABITAT
Hypericum majus	Large St. John's-wort	SS	Low wet places, ponds, lakes, riparian habitat; submerged for part of the growing season.
Juncus uncialis	Inch-high Rush	ST, BLM-S	Vernal pools and pond edges, in lithosol habitats in shrubsteppe.
Lathrocasis tenerrima	Delicate Gilia	SS, BLM-S	Rocky outcrops, bare gravelly openings in big sage shrubsteppe.
Lomatium roneorum	Rone's Biscuitroot	SE	Steep, sparsely vegetated slopes, sandstone soils, open pine forests.
Nicotiana attenuata	Coyote Tobacco	SS, BLM-S	Dry, sandy bottomlands, rocky washes, and other dry places.
Ophioglossum pusillum	Adder's Tongue	SS-BLM-S	Seasonally wet areas, meadows, grassy swales, flood plains.
Pediocactus nigrispinus	Dark-spine Ball Cactus	SS, BLM-S	Thin, rocky soils on slopes, ridgetops, valleys in shrubsteppe.
Penstemon eriantherus var. whitedii	Whited's Fuzzytongue Penstemon	ST, BLM-S	Slopes, ridgetops, dry rocky areas in Cascades foothills.
Petrophyton cinerascens	Chelan Rockmat	SE, BLM-S	In crevices and on ledges of open, exposed cliffs and rock outcrops along the Columbia River.
Phacelia lenta	Sticky Phacelia	ST, BLM-S	Arid Columbia Basin basalt cliff crevices, ledges, adjacent open rocky habitats. Occasionally on talus below rock outcrops.
Rorippa columbiae	Columbia Yellowcress	ST, BLM-S	Riverbanks, lakes and streams with extended periods of dryness.
Schizachyrium scoparium var. scoparium	Little Bluestem[2]	SS, BLM-S	Open places in sand, silt, cobble, and gravel, above and below the high-water line of the Columbia River, often in riparian communities.
Sidalcea oregana var. calva	Wenatchee Mountains Checkermallow	FE, SE	Alpine, montane wet meadow.
Silene scouleri ssp. scouleri	Scouler's Catchfly	SS, BLM-S	Grassy bluffs, rocky ridges, timbered slopes, upland meadows.

SCIENTIFIC NAME	COMMON NAME	LISTING STATUS[1]	HABITAT
Sisyrinchium montanum var. montanum	Strict Blue-eyed Grass	SS, BLM-S	Moist meadows, streambanks, open woods, in steppe and montane areas.
Spiranthes diluvialis	Ute Ladies'-tresses	FT, SE	Low-elevation wetlands, moist meadows, temporarily flooded sites with low vegetation cover.
Trifolium thompsonii	Thompson's Clover	ST, BLM-S	Lower mountain slopes and ridges in grasslands dominated by bunchgrasses and herbs.
Umbilicaria phaea var. coccinea	Navel Lichen	SE, BLM-S	Exposed to partly shaded basalt, on steep slopes, low to moderate elevations, in arid habitats.

Sources: BLM 2021; USFWS 1992 and 2023a; WADNR 2021a, 2021b and 2021c

[1] BLM-S = BLM WA Sensitive; FC = Federal Candidate; FE = Federally Endangered; FT = Federally Threatened; SE = State Endangered; ST = State Threatened; SC = State Candidate; SS = State Sensitive

[2]Element Occurrence recorded within the Rock Island Project Boundary prior to 2022.

5.4.6.2 Rare, Threatened, and Endangered Plants Study

A RTE plants study was conducted in 2022 to survey suitable habitat within the Rock Island Project Boundary (including a 100-foot buffer on adjacent public lands), the Home Water Wildlife Preserve, and lands within the Rock Island Project's primary transmission corridor. RTE plant species were defined to include all vascular plant, bryophyte, and lichen taxa with federal or state protective status or proposed federal status (see Appendices G.5 and I.1) (Beck Botanical Services 2023). Plant species for which surveys were conducted included, but were not limited to, those listed in Table 5.4-10. During the 2022 RTE plant surveys, six occurrences of federal and state listed RTE plant species (including sensitive) have been documented (see Appendix I.1) (Beck Botanical Services 2023).

Ute ladies'-tresses

A small population of ULT (federally threatened and state endangered) was identified during the 2022 RTE plants surveys (see Appendix I.1) (Beck Botanical Services 2023). While no new populations of ULT were discovered during the second year of surveys, 72 ULT plants were documented in 2023, a 188 percent increase from the ULT plants first recorded in 2022 (see Appendices I.1 and I.2) (Beck Botanical Services 2023; Chelan PUD 2023c). As recommended in the USFWS 1992 "Interim Survey Requirements for Ute Ladies'-tresses Orchid", a third year of monitoring for ULT in suitable habitat in the Rock Island Project Boundary will be conducted in 2024 (see Appendix I.2) (Chelan PUD 2023c).

ULT are small, perennial orchids known from open wetland and seasonally inundated riparian habitats in western states such as Utah, Colorado, Wyoming, Nebraska, Montana, Washington, and Idaho (WADNR 2023). The ULT plants are located along a steep bank that is seasonally inundated during spring runoff (typically May to June). ULT were previously discovered within the nearby Rocky Reach Project Boundary in 2000 (Calypso 2000) during a RTE plants survey and have since been monitored annually in that area (Pope and Cordell 2022).

Canadian St. John's-wort

A population of Canadian St. John's-wort (*Hypericum majus*) (state sensitive) was located during the 2022 RTE plants surveys (see Appendix I.1) (Beck Botanical Services 2023). This population was not previously known to be present in the Rock Island Project Boundary. Canadian St. John's-wort is a perennial herb with short leafy rhizomes that grows in areas that are either completely submerged or periodically inundated for much of the growing season (WADNR 2023). The population is estimated to be approximately 1,000 plants and was located in a small, shallow, protected inlet that is seasonally inundated by high flows.

Little bluestem

Little bluestem (*Schizachyrium scoparium var. scoparium*) (state sensitive) has been known in the Rock Island Project Boundary since 2001 when it was discovered and mapped in one Element Occurrence (EO).[58] At the time of its discovery, the population was estimated to be well over 1,000 plants across a 3.25-mile-long stretch of habitat. In the Rock Island Project Boundary, little bluestem grows in sand, gravel, and cobble substrates above and below the high-water line in open habitats (WADNR 2023). During the 2022 RTE plants surveys, this EO was revisited, and the population was found to be reduced in number to approximately 350 plants (see Appendix I.1) (Beck Botanical Services 2023).

Suksdorf's monkeyflower Beck Botanical Services 2023;

Suksdorf's monkeyflower (*Erythranthe suksdorfii*) (state sensitive) is a small annual herb that occurs in seasonally moist swales, drainages, or vernal pools within sagebrush steppe vegetation and its microhabitats are often disturbed by small erosive events (i.e., slumps, slides, bioturbidity, or frost boils) (WADNR 2023). Population numbers and locations may vary from year to year relative to seasonal weather conditions. Approximately 275 Suksdorf's monkeyflower plants were observed at two sites during the 2022 RTE plants surveys (see Appendix I.1) (Beck Botanical Services 2023).

Whited's fuzzytongue penstemon

Whited's fuzzytongue penstemon (state threatened) is a perennial herb that inhabits sparsely vegetated, west-facing slopes of small canyons, ridgetops, and dry rocky places in the foothills of the Cascades and in the Columbia Basin; sometimes with an abundance of caliche fragments (WADNR 2023). Two populations of Whited's fuzzytongue penstemon were observed in upland habitat during the 2022 RTE plants surveys (see Appendix I.1) (Beck Botanical Services 2023). Both populations combined consisted of approximately 270 plants.

Gray cryptantha

Gray cryptantha (state threatened) is a regional endemic in central Washington, restricted to areas where there is still some wind-derived movement of open sand (WADNR 2023). An EO of gray cryptantha was known to exist at one site in the Rock Island Project Boundary. Discovered in 2010, 14 plants were recorded in semi-stabilized sand dune habitat. In 2017, only three plants were

[58] WNHP defines "Element Occurrence" (EO) as an area of land and/or water in which a species or natural community is, or was, present.

observed in this EO. None of the gray cryptantha plants were observed during the 2022 RTE Plants surveys (see Appendix I.1) (Beck Botanical Services 2023).

5.4.6.3 Noxious Weeds

The area of the Rock Island Project has been subjected to long-term human occupation and land use. These land use practices have included residential and commercial development, irrigated orchards (predominantly apple, pears, and cherries), and rangeland grazing. Often, these land use practices have resulted in the change from native plant communities to communities dominated by non-native plants (NMFS 2002a).

Pre-flood vegetation studies along Rock Island Reservoir (WDG 1978) documented a variety of weed species that were present in the mid-1970s, including: tree-of-heaven (*Ailanthus altissima*), Russian olive (*Elaeagnus angustifolius*), Siberian elm (*Ulmus pumila*), diffuse knapweed (*Centaurea diffusa*), Russian thistle (*Salsola tragus*), and cheatgrass.

Noxious weeds include non-native and invasive grasses, flowering plants, shrubs and trees, and aquatic plants. Those commonly found within and around the Rock Island Project include diffuse knapweed, cheatgrass, whitetop (*Lepidium draba*), and Dalmatian toadflax (*Linaria dalmatica*; Table 5.4-11). Some of these noxious weeds are also associated with wet areas and are described further in Section 5.5.4.

Table 5.4-11 Terrestrial Noxious Weeds Recorded in the Area of the Rock Island Project

SCIENTIFIC NAME	COMMON NAME	WA STATE NOXIOUS WEED LIST CLASSIFICATION[1]
Alhagi maurorum	Camelthorn*	Class B
Amorpha fruticosa	Indigo-bush	Class B
Bassia scoparia	Kochia (Burning Bush)	Class B
Centaurea diffusa	Diffuse Knapweed	Class B
Chondrilla juncea	Rush skeletonweed	Class B
Fallopia × bohemica	Bohemian Knotweed	Class B
Fallopia japonica	Japanese Knotweed	Class B
Lepidium latifolium	Perennial (Broad-leaved) Pepperweed	Class B
Linaria dalmatica	Dalmatian Toadflax	Class B
Phragmites australis	Common Reed	Class B
Rhaponticum repens	Russian Knapweed (Hardhead)	Class B
Ailanthus altissima	Tree-of-Heaven	Class C
Cirsium arvense	Canada Thistle	Class C
Convolvulus arvensis	Field Bindweed	Class C
Crataegus monogyna	English Hawthorn	Class C

SCIENTIFIC NAME	COMMON NAME	WA STATE NOXIOUS WEED LIST CLASSIFICATION[1]
Elaeagnus angustifolia	Russian Olive	Class C
Gypsophila paniculate	Babysbreath	Class C
Hypericum perforatum	Common St. John's-wort	Class C
Lepidium draba	Whitetop	Class C
Rubus armeniacus	Himalayan Blackberry	Class C
Secale cereale	Cereal Rye	Class C
Tanacetum vulgare	Common Tansy	Class C
Tribulus terrestris	Puncturevine	Class C

Sources: Chelan PUD 2021c; K. Cordell, pers. comm. 2022; Wooten and Morrison 2008; WSNWCB 2021; WSRCO 2023
*Previously observed at Horan Natural Area, now believed to be extirpated due to control efforts (K. Cordell, pers. comm. 2022).
[1]Class B noxious weeds are those noxious weeds not native to the state that are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region.
Class C are any other noxious weeds (see: https://app.leg.wa.gov/WAC/default.aspx?cite=16-750-003).

Chelan PUD has implemented several terrestrial noxious weed control efforts along the Rock Island Project. Chelan PUD has controlled terrestrial weedy invasives on fee title properties and rights-of-way in accordance with easement and county noxious weed control requirements. Chelan PUD has also coordinated weed control efforts with Washington State Parks for the Wenatchee Confluence including the NHA. Camelthorn (*Alhagi maurorum*), a class B designated species,[59] was previously documented and subsequently controlled within the HNA. The small infestation was treated with herbicide over a number of years, and is considered extirpated from the site, according to regular monitoring, which has not located any additional plants (K. Cordell, personal communication, May 21, 2022).

Chelan PUD has also coordinated with the UW Douglas County Extension to release biological controls for weed control efforts along Rock Island Reservoir. Biological controls released include insects to control Dalmatian toadflax and diffuse knapweed.

Included within Chelan PUD's Integrated Weed Management Plan for the Home Water Wildlife Preserve are measures to utilize a contracted licensed pesticide applicator. Chelan PUD has partnered with the Chelan-Douglas Land Trust (CDLT), the Chelan County Noxious Weed Control Board, and adjacent public and private property owners to coordinate efforts to control noxious weed populations at the Home Water Wildlife Preserve (Chelan PUD 2021c).

[59] Class B designated species means those Class B noxious weeds whose populations in a region or area are such that all seed production can be prevented within a calendar year (WAC 16-750-004).

5.4.7 Lands Managed for Wildlife Under the Current License

5.4.7.1 Home Water Wildlife Preserve

Chelan PUD owns and manages the Home Water Wildlife Preserve for wildlife habitat mitigation for the Rock Island Project, as required by FERC in the 1989 license. The 960-acre preserve is primarily upland habitat with some small ephemeral streams and springs that contain riparian habitat. The Home Water Wildlife Preserve is located in the foothills just west of Wenatchee, approximately 2.5 miles inland from the west bank of the Columbia River (Figure 5.4). As stipulated in Article 403, the property is managed to preserve existing wildlife values (FERC 1989) for wildlife habitat (Chelan PUD 2007 and 2017). There are no formal (FERC-approved) management plans for the preserve. The habitat is generally composed of shrubsteppe, which is particularly valuable for wintering mule deer. This area contains some of the last remaining low elevation winter range for the mule deer that has not been impacted by residential or agricultural development within the vicinity of the Rock Island Project.

The upper elevation slopes of the Home Water Wildlife Preserve are used by Dusky Grouse (*Dendragapus obscurus*) for nesting and early brood rearing. Year-round resident species known to utilize the Home Water Wildlife Preserve include species such as California Quail (*Callipepla californica*), Chukar, Red-tailed Hawk, American Kestrel (*Falco sparverius*), coyote (*Canis latrans*), and a variety of rodents, bats, and songbirds (Chelan PUD 2007).

In 2007, FERC approved Chelan PUD's proposal to permit the city of Wenatchee[60] to construct a segment of public trail across the Home Water Wildlife Preserve that connects a broader community trail system located outside the Rock Island Project Boundary. The trail system within the Home Water Wildlife Preserve contains approximately 2.2 miles of authorized trails and 8 miles of remnant roads and trails. The Home Water Wildlife Preserve is closed to public access between December 1 and March 31 to protect wintering deer and other wintering wildlife (Chelan PUD 2017). In addition to Chelan PUD closing the preserve, the city of Wenatchee and CDLT closed adjacent trails and trailheads on either side of the Home Water Wildlife Preserve to provide a much larger winter wildlife preserve each winter.

In 2022, FERC approved[61] an application for CDLT to construct a multi-use, non-paved public trail in the Home Water Wildlife Preserve. CDLT will enhance 4.61 miles of old road and trail areas and restore 4.45 miles of old road and trail areas to natural conditions. These restoration activities will

[60] FERC Accession Number 20070318-3030.
[61] FERC Accession Number 20220202-3000.

provide benefits to wildlife by keeping members of the public on only designated trails during limited portions of the year.

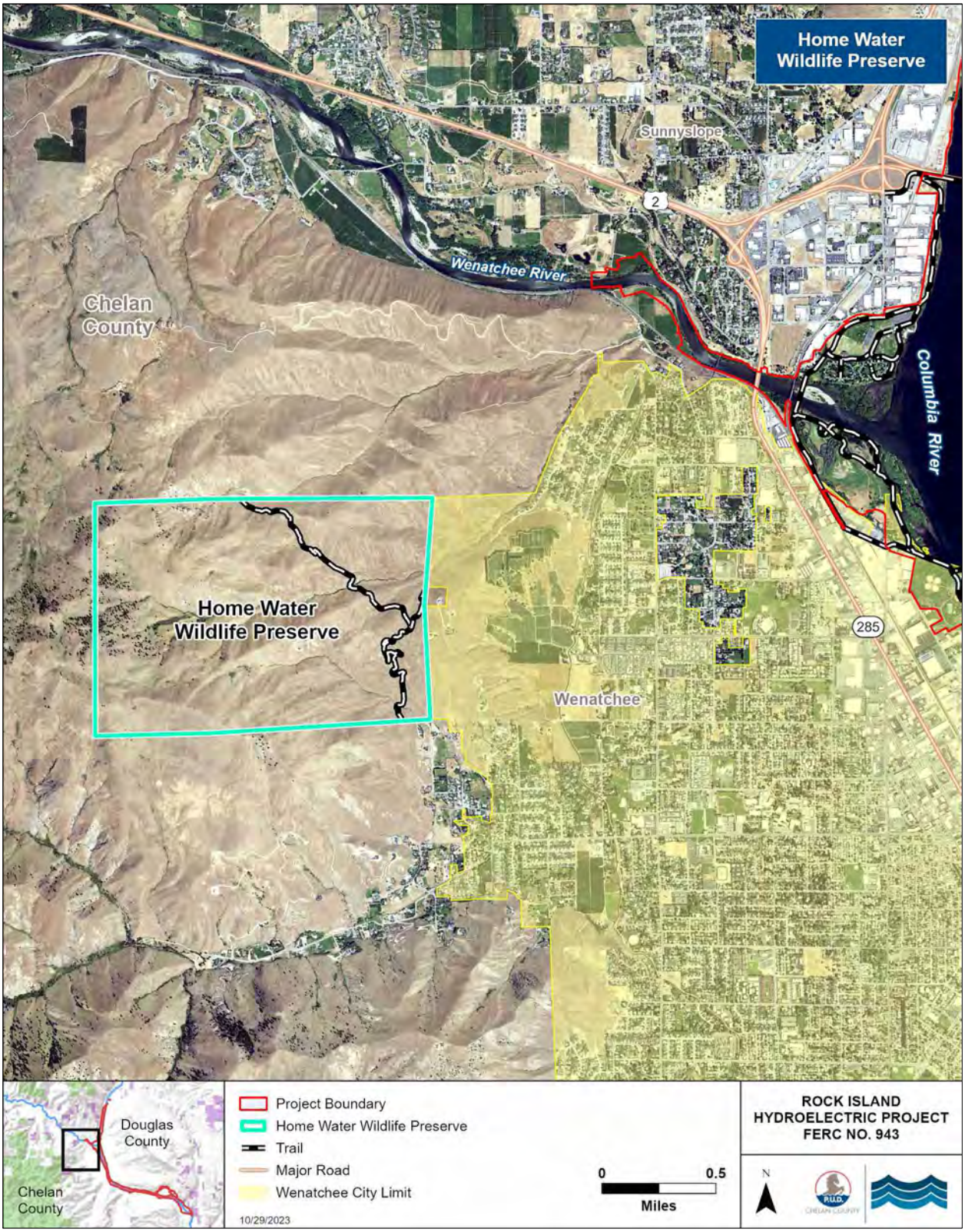


Figure 5.4-8 Home Water Wildlife Preserve

5.4.8 Commercially, Recreationally and Culturally Significant Species

Recreationally (Sections 3.6.4 and 5.6.5), culturally (Sections 5.3.6.2 through 5.3.7.2) and economically (Section 5.11.4) important species, as they are currently known to Chelan PUD, are identified in several sections of this document.

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5.5 Wetland, Riparian and Littoral Habitat

As specified in 18 CFR § 5.6(d)(3)(vi), this section describes wetlands, riparian, and littoral habitat that can be found in the area of the Rock Island Project.

5.5.1 Wetland and Littoral Areas

Wetlands are defined as soils that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support vegetation typically adapted for life in saturated soil conditions. According to Cowardin et al. (1979), wetlands must have one or more of the following three attributes:

- At least periodically, the land supports predominantly hydrophytes;
- The substrate is predominantly undrained hydric soil; and
- The substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of the year.

Similarly, Ecology defines wetlands[62] as:

"[A]reas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites including, but not limited to, irrigation and drainage ditches, grass-filled swales, canals, detention facilities, wastewater treatment facilities, farm ponds, landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway Wetland may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands…"

Wetlands provide many important functions and values. Hydrologic functions include slowing and storing floodwaters, maintaining stream flows, shoreline stabilization, and groundwater discharge and recharge. Wetlands maintain biodiversity by providing nesting, feeding, and breeding habitat for wildlife and fish, as well as providing native plant reserves. Other wetland functions include improving water quality by filtering sediments, nutrients, and toxins from surrounding areas.

[62] WAC 173-201A-020 definition of wetlands: https://app.leg.wa.gov/wac/default.aspx?cite=173-201A-020.

Wetlands provide many human-defined values, such as recreation opportunities, including birding and wildlife viewing, aesthetic appreciation of the natural landscape, and heritage value (Canning and Stevens 1990). Chelan PUD developed a SMM designed to protect and enhance the scenic, recreational, and environmental values of the lands and shorelines of the Rock Island Project. These areas include riparian environments and wetlands (Chelan PUD 2023a).

According to the USFWS NWI there are approximately 3,660 acres of aquatic resources within the Rock Island Project Boundary (Figure 5.5-1 and Figure 5.5-2) (USFWS 2023). Most resources are open water habitats. The remaining aquatic resources are palustrine wetlands followed by freshwater ponds (Table 5.5-1).

Table 5.5-1 Wetland Types within the Rock Island Project Boundary

WETLAND TYPE	NATIONAL WETLANDS INVENTORY CLASSIFICATION	ACRES
Freshwater Emergent Wetland	Palustrine Emergent	42.20
Freshwater Forested/Shrub Wetland	Palustrine Forested/Scrub Shrub	29.76
Freshwater Pond	Palustrine Unconsolidated Bottom	18.10
Lacustrine (Lake)	Lacustrine Unconsolidated Bottom	3,552.45
Riverine	Riverine	17.42
Total		3,659.93

Source: USFWS 2023

Figure 5.5-1 National Wetland Inventory Wetlands within the Rock Island Project Boundary (1 of 2)

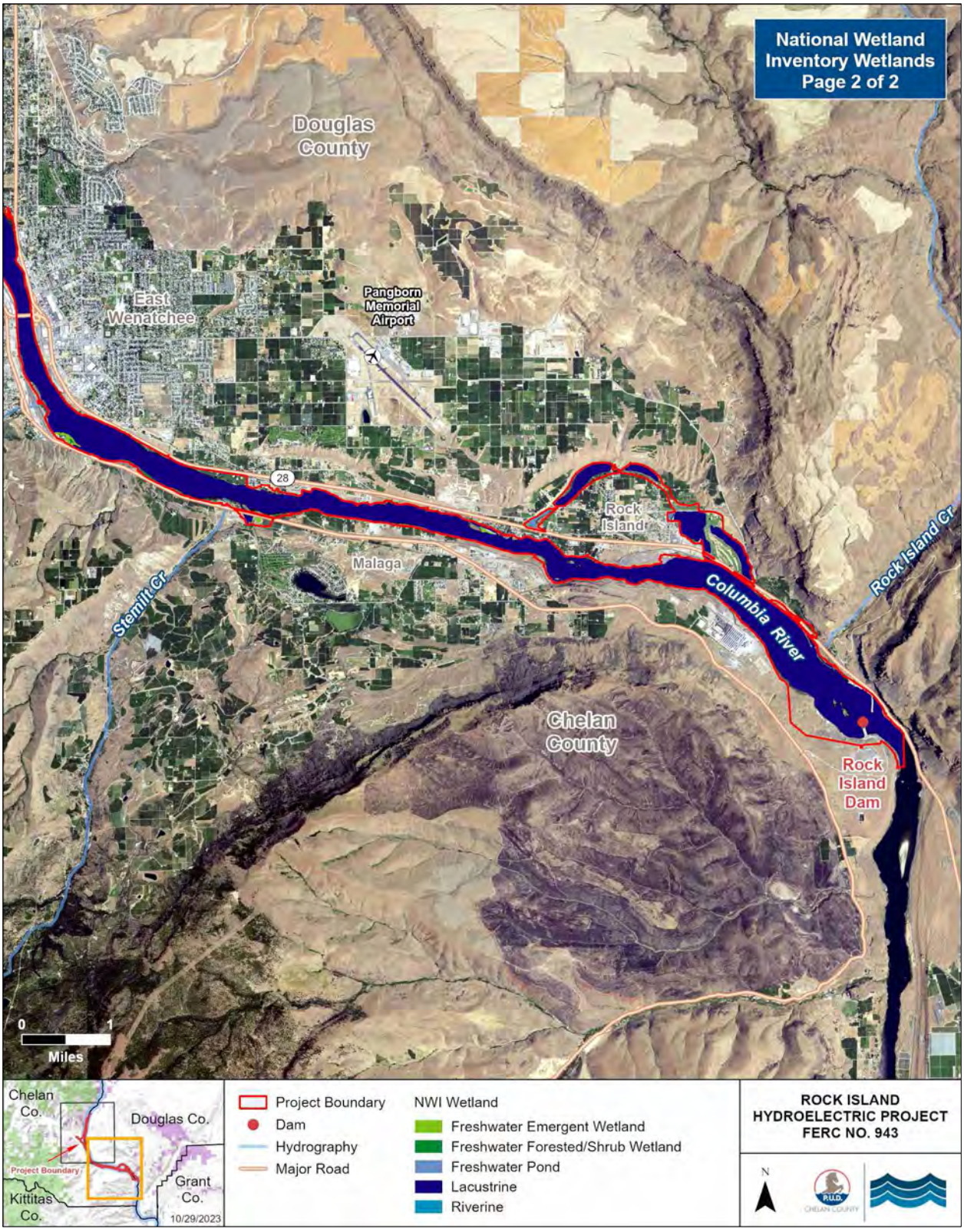

Figure 5.5-2 National Wetland Inventory Wetlands within the Rock Island Project Boundary (2 of 2)

5.5.1.1 Freshwater Emergent Wetland/Palustrine Emergent

Palustrine emergent wetlands are defined by their characteristics as "erect, rooted, herbaceous hydrophytes, with the exception of mosses and lichens" (Cowardin et al. 1979). These wetlands may experience surface water inundation that range from relatively brief (less than 3 months) to permanent. However, the water depth is typically shallow, usually less than 3 ft, allowing rooted plants to emerge in at least part of the wetland. Emergent wetlands represent the most abundant type of palustrine wetlands within the Rock Island Project Boundary, with a significant concentration near the confluence of the Wenatchee River, the HNA, and the Columbia River (Table 5.5-1, Figure 5.5-1 and Figure 5.5-2). Common species in these emergent wetlands may include reed canarygrass (*Phalaris arundinacea*), hardstem bulrush (*Scirpus acutus*), softstem bulrush (*Scirpus validus*), three-square bulrush (*Scirpus americanus*), and cattail (*Typha latifolia*) (Canning and Stevens 1990).

5.5.1.2 Freshwater Shrub Wetland/Palustrine Scrub Shrub

Scrub shrub wetlands are characterized by the prevalence of woody vegetation reaching heights of less than 20 ft (Cowardin et al. 1979). These species include true shrubs, young trees, and trees or shrubs that are small or stunted due to environmental conditions. In the Eastern Cascades ecoregion, scrub shrub wetlands are primarily restricted to river and stream corridors. Within the Rock Island Project Boundary, scrub shrub wetlands are sporadically situated along the impoundment shore, at Porters Pond, Stemilt Creek, and along the mouth of the Wenatchee River (Table 5.5-1, Figure 5.5-1 and Figure 5.5-2). Dominant species may include willows (*Salix lasiandra, S. exigua, S. amygdaloides*), red osier dogwood (*Cornus sericea*), Douglas hawthorn (*Cratagus douglasii*), wood rose (*Rosa woodsii*), Nootka rose (*Rosa nutkana*), currant (*Ribes* spp.), serviceberry, water birch *(Betula occidentalis*), and introduced species like Russian olive and Himalayan blackberry (*Rubus armeniacus*) (Canning and Stevens 1990; NMFS 2002).

5.5.1.3 Freshwater Forested/Palustrine Forested

Palustrine forested wetland habitat is distinguished by the presence of woody vegetation reaching a height of 20 ft tall or more (Cowardin et al. 1979). These palustrine forested wetland areas are primarily situated along the impoundment in the central region of the Rock Island Project Boundary. Additionally, there are smaller wetland areas along the shore of the Wenatchee River and a limited section along the shore of Putters Pond near the city of Rock Island (Table 5.5-1, Figure 5.5-1, and Figure 5.5-2). These wetlands are predominately characterized by broad-leaved deciduous trees. Typical native species may encompass maple (*Acer* sp.), thin-leaved alder (*Alnus incana var. tenuifoliamale*), aspen (*Populus* spp.), water birch, and black cottonwood (Canning and

Stevens 1990). Introduced species, such as Siberian elm, tree-of-heaven, black locust (*Robinia pseudoacacia*), and sycamore (*Platanus* sp.), are also commonly observed along the reservoir.

5.5.1.4 Lake/Lacustrine Unconsolidated Bottom

Lacustrine environments constitute the majority of the aquatic resources within the Rock Island Project Boundary, accounting for over 97 percent of such resources. They are primarily associated with the impoundment and the Rock Island Ponds, which include Big Bow Pond, Hammond Pond, Hideaway Pond and Putters Pond (Table 5.5-1, Figure 5.5-1 and Figure 5.5-2). These environments represent deepwater habitats where the presence of vegetation is generally confined to the littoral zone. The littoral zone spans from the shoreline to an approximate depth of 8 ft or to the extent of non-persistent vegetation, should it extend beyond depths exceeding 8 ft (Cowardin et al. 1979). This zone may be devoid of vegetation, featuring a substrate of cobble-gravel, sand, mud, or organic material, or it may host non-persistent species that grow either at or below the water surface, forming an aquatic bed wetland. Common species in this habitat include arrowhead (*Sagittaria latifolia*), water-plantain (*Alisma gramineum*), smartweed (*Polygonum amphibium*), yellow water lily (*Nuphar lutea*), common mare's-tail (*Hippuris vulgaris*), and pondweed (*Potomogeton* spp.) (Canning and Stevens 1990).

5.5.1.5 Riverine

Riverine systems are wetlands or deepwater habitats that occur within a channel, unless the system is predominantly covered by vegetation, or the water contains ocean-derived salts at or above 0.5 parts per thousand (Cowardin et al. 1979). In the Rock Island Project Boundary, riverine systems are connected to the Wenatchee River and several small perennial and intermittent streams that flow into the impoundment (Table 5.5-1, Figure 5.5-1 and Figure 5.5-2). The Wenatchee River is characterized as an upper perennial stream with a steep gradient and a substrate consisting of rock, cobble, or gravel. Many wildlife species found in the Rock Island Project area are known to use the shoreline of the Columbia River (NMFS 2002). For a comprehensive list of wildlife species present in the Rock Island Project area, including the river shoreline, refer to Section 5.4.

5.5.2 Riparian Zone

The riparian habitat serves as a protective buffer zone between the upland vegetation community and the riverine environment. This zone is essential for streambank stability and sediment filtration, providing important support for the overall ecosystem. It also serves as habitat for upland game birds and songbirds offering feeding, breeding, and nesting ground. Riparian vegetation, especially black cottonwoods, willows (*Salix* spp.), and emergent plants in backwater

areas, offers important habitat for aquatic furbearers, such as beavers *(Castor canadensis*), muskrats (*Ondatra zibethicus*), mink (*Mustela vison*), and river otters (*Lutra canadensis*) (NMFS 2002). See Section 5.4 for a full list of wildlife and plant species that inhabit the Rock Island Project area, including the riparian zone.

During the 2022 RTE plants surveys, a population of ULT was identified (see Appendix I.1) (Beck Botanical Services 2023). Monitoring efforts in 2023 confirmed the presence of ULT in the same location (see Appendix I.2) (Chelan PUD 2023b).

Locations within the Rock Island Project area are predominately characterized by commercial and residential development associated with the cities of Wenatchee and East Wenatchee. Several state routes, including Routes 2, 28, 285, 97, and 97A, traverse the riparian zone of the Rock Island Project at various points in the southeast and northwest areas of the area. Agricultural fields are primarily concentrated in the northeast and central part of the Rock Island Project, extending to the vicinity of the city of Rock Island. Open grasslands and shrublands are distributed throughout the riparian zone, with a higher concentration in the northern and southern edges of the Rock Island Project (MRLC 2016).

5.5.3 Aquatic Plants

Aquatic plant surveys were conducted in the Rock Island Reservoir in the early 1990s (Chelan PUD 1990) and again in 2023 (see Appendix G.2) (EAS 2023). Table 5.5-2 provides a list of aquatic vegetation identified within the Rock Island Project for both the 1990 and 2023 surveys. These surveys indicated that water depth was the most consistent variable in predicting the distribution and density of aquatic plants, consistent with observations from previous aquatic plant surveys in the Wells Reservoir (Lê and Kreiter 2006). Notably, bi-annual surveys of nearby Rocky Reach Reservoir revealed regular and significant differences in both macrophyte distribution and composition when compared to the Rock Island Reservoir.

Table 5.5-2 Native Aquatic Vegetation Species Identified in the Rock Island Project

SCIENTIFIC NAME	COMMON NAME
Ceratophyllum demersum	Coontail
Elodea conadaensis	Common Waterweed*
Heteranthera dubia	Water Star-grass
Potamogeton nodosus	Long Leaf Pondweed
Potamogeton praelongus	White-stemmed Pondweed
Potamogeton pussilus	Small Pondweed*
Potamogeton zosteriformis	Flat-stemmed Pondweed

Source: EAS 2023; Chelan PUD 1990
*Species historically observed but not present in 2023.

5.5.4 Invasive Plant Species

Invasive plant species, including noxious weeds,[63] are commonly found within riparian areas and associated wetlands around the Rock Island Project. Riparian emergent noxious weeds include reed canarygrass (Class C), yellow flag iris (*Iris pseudacorus*) (Class C), Himalayan blackberry (Class C), and purple loosestrife (*Lythrum salicaria*) (Class B). Submergent noxious weeds consist of Eurasian watermilfoil (*Myriophyllum spicatum*) (Class B), curly leaf pondweed (*Potamogeton crispus*) (Class C) and flowering rush (*Butomus embellatus*) (Class A) (Chelan PUD 2018 and 2020; NMFS 2002; USDA 2022; WSNWCB 2021a and 2021b).

In 2008, the Pacific Biodiversity Institute conducted a rare plant and vegetation survey of Wenatchee Confluence State Park for the Washington State Parks and Recreation Commission (Wooten and Morrison 2008). The most common noxious weed found in wetland areas was reed canarygrass, with yellow flag iris and Eurasian watermilfoil also present (Wooten and Morrison 2008).

As shown in Table 5.2-7, both Putters Pond and Pit Pond are listed by Ecology as water quality impaired for non-native aquatic plants. Surveys conducted by Ecology between 2006 and 2017 identified Eurasian watermilfoil in both ponds. A 2005 Determination of Non-significance from WDFW authorized the introduction of triploid grass carp (*Ctenopharyngodon idella*) into Pit Pond to control aquatic vegetation.

During the 2023 macrophytes study (see Appendix G.2) (EAS 2023), Eurasian watermilfoil and curly leaf pondweed were documented in the Rock Island Reservoir. Notably, no flowering rush was observed despite targeted surveys (see Appendix G.2) (EAS 2023).

5.5.5 References

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[63] Class A Weeds: are those noxious weeds not native to the state that are of limited distribution or are unrecorded in the state and that pose a serious threat to the state.
Class B Weeds: are those noxious weeds not native to the state that are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region.
Class C Weeds: are any other noxious weeds.
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Wooten, G., and P. H. Morrison. 2008. Rare Plant and Vegetation Survey of the Wenatchee Confluence State Park. Pacific Biodiversity Institute.

5.6 Recreation Resources

As specified in 18 CFR §5.6(d)(3)(viii), this section summarizes readily available information on recreation resources in and surrounding the Rock Island Project, and regional recreation opportunities in the vicinity of Chelan PUD's existing parks.

5.6.1 Background

Along the Rock Island Project's 20-mile reservoir, Chelan PUD owns and manages 1,500 acres of land with public access, including approximately 400 acres of public parks developed within the Rock Island Project Boundary. The Rock Island Project's FERC-approved recreation sites consist of Wenatchee Confluence State Park, which includes the HNA,[64] Walla Walla Point Park, Wenatchee Riverfront Park, Kirby Billingsley Hydro Park, and the Coyote Dunes Natural Area. Construction of the existing park system began in the 1980s and continued into the 1990s, with numerous public-supported additions and enhancements since then. Today the Rock Island Project provides for a wide diversity of year-round recreational opportunities and reservoir access.

On March 29, 1974[65] the Federal Power Commission, now FERC, issued an amendment to the original license for the Rock Island Project that approved the construction of a second powerhouse, modifications to the existing dam to raise the reservoir level, and provisions for recreational amenities. Article 55 of the prior license (as amended) required Chelan PUD to prepare and file a Recreation Plan (Exhibit R) in accordance with applicable federal regulations.

In response to that order, and following a public participation and planning effort, on March 1, 1978, Chelan PUD filed with FERC a Recreation Plan (1978 Plan; Exhibit R)[66] for the Rock Island Project, in which Chelan PUD proposed to develop six recreation sites along the shoreline of the Rock Island Project:

- Dam Overlook (ultimately not developed);
- Douglas County Park (became Rock Island Hydro Park and is now called Kirby Billingsley Hydro Park);
- Wenatchee Riverfront (now Wenatchee Riverfront Park);
- Walla Walla Point (now Walla Walla Point Park);

[64] The Horan Natural Area or HNA is located within Wenatchee Confluence State Park.
[65] FERC Accession Number 19880109-1177.
[66] FERC Accession Number 19880109-1286.

- Wenatchee River Confluence North (now combined with Confluence South as Wenatchee Confluence State Park); and
- Wenatchee River Confluence South (now combined with Confluence North as Wenatchee Confluence State Park; this southern portion is also commonly known as the HNA).

The Recreation Plan addressed two additional sites available for future development that were not developed as FERC-approved Recreation Sites, including the Porters Pond and the Olds Station Bridge site (later developed as the Coyote Dunes Natural Area, see Section 5.6.2.5).

In the 1978 Plan, Chelan PUD proposed development of the Dam Overlook site, located on a bluff south of the Rock Island Project; in its 1979 Order Approving Exhibit R[67] however, FERC determined that the Dam Overlook site was not necessary. Rather, FERC recommended that Chelan PUD retain the site for potential future development. Chelan PUD still owns the Dam Overlook site however; this area has been developed as a staging and storage yard to support utility operations. Porters Pond is a passive recreation site owned and managed by the city of East Wenatchee, Douglas County, and WADNR (see Section 5.6.3.3); it is not a FERC-approved recreation facility.

FERC's 1979 Order approved the Recreation Plan in part and included other recreation requirements, including the expansion of the Walla Walla Point Park and Wenatchee River Confluence North sites. Following several amendments to the 1978 Plan,[68] construction started on the five parks identified for development.

On December 8, 1992, Chelan PUD filed an application to amend the Recreation Plan for the Rock Island Project. On June 24, 1993, FERC approved this amendment,[69] which authorized additional recreation facilities at the existing parks, minor adjustments in the Exhibit R and Rock Island Project Boundary, and approval of as-built drawings for completed park facilities.

[67] Exhibit R of the project license, "Recreation Plan for the Rock Island Project" was approved in ordering paragraph (B) of the Commission's Order on Remand Issuing License (Major) and Approving Settlement Agreement (FERC Accession Number 19890125-0490).
[68] Order Approving Revised Recreation Plan, and Revised Exhibits G and R As-built Drawings (FERC Accession Number 19930624-0129). Order Amending Project Boundary and Project Recreation Plan and Approving Change in Project Land Rights (FERC Accession Number 20080902-3022).
[69] FERC Accession Number 19930624-0129.

On March 15, 2018, FERC issued an Order approving development of the Coyote Dunes Natural Area[70] for passive recreation. On March 15, 2023, FERC approved a Final Coyote Dunes Natural Area Management Plan.[71]

Following all the above FERC-approved changes, Chelan PUD's FERC-approved recreation sites now include:

- Wenatchee Confluence State Park and the HNA;
- Walla Walla Point Park;
- Wenatchee Riverfront Park;
- Kirby Billingsley Hydro Park; and
- Coyote Dunes Natural Area.

The following table provides a history of the relevant Rock Island Project Recreation Orders, Amendments, Submissions, etc., since the 1978 original Rock Island Project Recreation Plan (Table 5.6-1).

Table 5.6-1 Rock Island Project Recreation Orders, Amendments, and Submissions

NAME	DATE ISSUED OR FILED	ACCESSION NUMBER	CITATION (IF APPLICABLE)
Exhibit R Recreation Plan (original)	03/01/1978	19880109-1286	
FERC Memo Regarding Exhibit R	10/19/1979	19880109 -1928	
Revised Exhibit R Recreation Plan (Walla Walla Point and Wenatchee River Confluence North)	10/22/1980	20000108-0026	
Order Approving Amendment to Exhibit R	01/05/1981	19880109-1436	
Order Issuing New License	05/13/1981	19880109-1432	14 FERC ¶ 62,187
Application for approval of revised Exhibit R Recreation Use Plan	05/18/1983	19830520-0107; 19830520-0102	
Order approving revisions to Exhibit R Recreation Use Plan	09/08/1983	19830912-0067	24 FERC ¶ 62,281
Order on Remand Issuing New License (Major) and Approving Settlement Agreement	01/18/1989	19890125-0490	46 FERC ¶ 61,033
Design drawings of relocated hiking trails for bald eagle nesting	08/18/1989	19890821-0273	

[70] FERC Accession Number 20180315-3058.
[71] FERC Accession Number 20230315-3011.

NAME	DATE ISSUED OR FILED	ACCESSION NUMBER	CITATION (IF APPLICABLE)
Order Approving Recreation Drawings (re-aligned hiking trails)	05/25/1990	19900530-0189	51 FERC ¶ 62,183
Submitted status of Exhibit R Recreation Plan	12/03/1992	19921213-0284	
Order Approving Revised Recreation Plan and Revised Exhibits G and R As-built Drawings (Rock Island Hydro Park [Kirby Billingsley Hydro Park], Walla Walla Point Park, Wenatchee Confluence State Park, Wenatchee Riverfront Park	06/18/1993	19930624-0129	63 FERC ¶ 62,299
Submitted Exhibit R as-built drawings for Walla Walla Point and Confluence Park	12/24/1996	19970103-0359	
Order approving Exhibit R as-built drawings of Walla Walla Point and Confluence Park	10/07/1997	19971009-0374	81 FERC ¶ 62,012
Request for Concurrence to Proceed with Addition of a New Day-use Boat Moorage and Support Facilities (Wenatchee Riverfront Park)	12/18/2006	20061221-0209	
Request to remove 1.01 acres (Wenatchee Riverfront Park)	10/05/2007	20071010-0038	
Amendment to Exhibit R to modify Project Boundary (Wenatchee Confluence State Park)	12/21/2007	20071228-0101	
Revised Exhibit R to rename Rock Island Hydro Park to Kirby Billingsley Hydro Park	01/11/2008	20080111-5106	
Order Amending Recreation Plan (Wenatchee Riverfront Park)	02/28/2008	20080228-3016	122 FERC ¶ 62,192
Order Amending Project Boundary (Wenatchee Confluence State Park)	06/05/2008	20080605-3022	123 FERC ¶ 62,195
Revised Exhibit R drawings (Wenatchee Confluence State Park)	07/30/2008	20080730-4000	
Order Amending Project Boundary and Project Recreation Plan and Approving Change in Project Land Rights (Wenatchee Riverfront Park)	09/02/2008	20080902-3022	124 FERC ¶ 62,164
Order Approving Revised Exhibit R (Wenatchee Confluence Park)	12/04/2008	20081204-3031	125 FERC ¶ 62,227
Approved Exhibit R Drawing (Wenatchee Confluence Park)	01/21/2009	20090126-0298; 20090121-4008	
Revised Exhibit R Drawing (Wenatchee Riverfront Park)	12/24/2009	20091224-5031	

NAME	DATE ISSUED OR FILED	ACCESSION NUMBER	CITATION (IF APPLICABLE)
Revised Exhibit R Drawing (Wenatchee Riverfront Park)	12/22/2010	20101222-5167; 20101222-5166	
Order Approving As-built Drawing (Wenatchee Riverfront Park)	04/12/2011	20110412-3033	135 FERC ¶ 62,026
Errata Notice Order Approving As-Built Drawing (Wenatchee Riverfront Park)	04/14/2011	20110414-3055	
Revised Exhibit R Recreation Plan to the Olds Bridge recreation site (Coyote Dunes Natural Area)	01/09/2018	20180109-5208	
Order Amending Recreation Plan and Amending Project Boundary	03/15/2018	20180315-3058	162 FERC ¶ 62,165
Submitted Coyote Dunes Natural Area Management Plan and As-Built Drawings	09/30/2022[72]	20220930-5389; 20220930-5390	
Order Approving Coyote Dunes Natural Area Management Plan	03/15/2023	20230315-3011	182 FERC ¶ 62,153
Submitted Non-Capacity Amendment for Wenatchee Riverfront Park	04/17/2023	20230417-5267	
Submitted Non-Capacity Amendment Walla Walla Point Park	05/17/2023	20230517-5222	
Order Amending Recreation Management Plan for Walla Walla Point Park	07/06/2023	20230706-3016	184 FERC ¶ 62,010
Order Amending Recreation Management Plan for Wenatchee Riverfront Park	07/20/2023	20230720-3004	184 FERC ¶ 62,034

5.6.2 FERC Approved Recreation Sites, Facilities and/or Amenities within the Rock Island Project Boundary

Chelan PUD implemented the Rock Island Project Recreation Plan (Exhibit R) to improve public access and develop recreation sites in the Rock Island Project Boundary. As part of the Recreation Plan, Chelan PUD developed and maintains five recreation sites and facilities in the Rock Island Project Boundary (Table 5.6-2 and Figure 5.6-1).

Table 5.6-2 Rock Island Project Recreation Facilities

RECREATION SITE NAME	RECREATION AMENITIES
Wenatchee Confluence State Park	picnic shelters sports courts sports field restrooms

[72] Filed as Privileged.

RECREATION SITE NAME	RECREATION AMENITIES
	designated group campsite area designated camp areas designated swim area gravel hiking/walking trail paved hiking/walking/biking trail boat launch and dock (2 boat launch lanes) Interpretive signage Interpretive Kiosks day use and boat launch parking playgrounds
Walla Walla Point Park	picnic shelters sports courts sports fields restrooms paved hiking/walking/biking trail designated swim area playground day use parking
Wenatchee Riverfront Park	restrooms day use moorage paved hiking/walking/biking trail boat launch access (2 boat launch lanes) day use parking
Kirby Billingsley Hydro Park	picnic shelter sports courts sports fields paved hiking/walking/biking trail restrooms designated swim area boat launch and dock (2 boat launch lanes) day use and boat launch parking
Coyote Dunes Natural Area	Interpretive signage (described in the Final Coyote Dunes Natural Area Management Plan) natural surface trail system

Source: Kleinschmidt 2023

The following sections summarize the FERC-approved Rock Island Project recreation sites and facilities in Chelan PUD's Rock Island Project Recreation Plan. For more information, please see the Recreation Inventory Study (Appendix G.6).

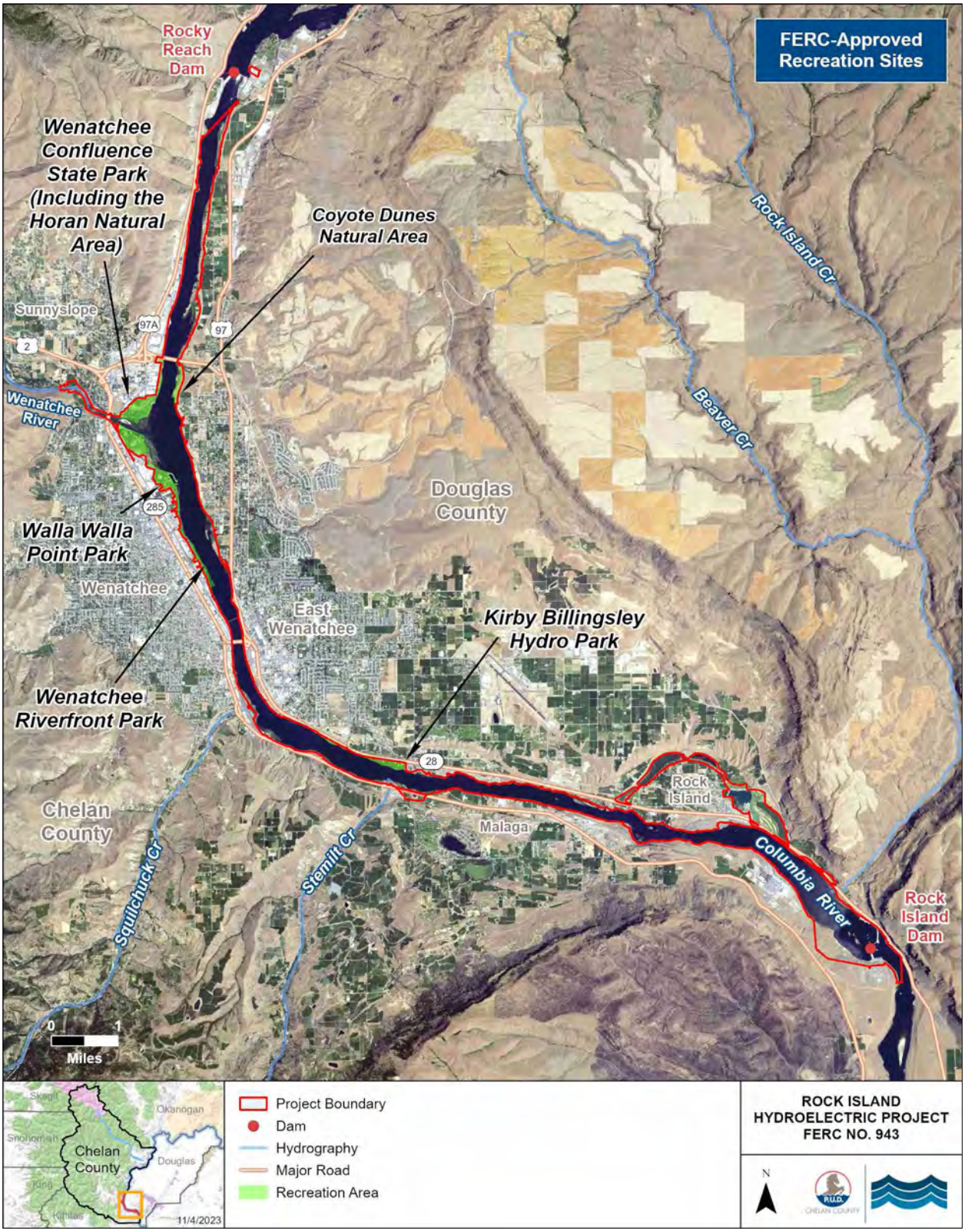

Figure 5.6-1 FERC-Approved Recreation Sites in the Rock Island Project Recreation Plan

5.6.2.1 Wenatchee Confluence State Park

Wenatchee Confluence State Park sits at the confluence of the Wenatchee and Columbia rivers, approximately 17 miles north of the Rock Island Dam. The park is comprised of Wenatchee Confluence State Park North and Wenatchee Confluence State Park South. Confluence State Park North is managed as a developed recreation site with a multitude of day-use and overnight amenities. Confluence State Park South, locally known as the Horan Natural Area or HNA, is preserved and managed as a passive recreation natural area. Both the Apple Capital Loop Trail (ACLT) connect areas of the park[73] Bridge, a pedestrian footbridge over the Wenatchee River. The park is accessible to vehicles via Old Station Road, a two-lane paved road. The park is accessible to pedestrians and bicyclists via the ACLT, and to boaters via the boat launch and dock. Chelan PUD owns the site, and Washington State Parks manages the site. The day use areas of the park are operated from dawn until dusk, year-round; operational times may vary seasonally. The campground area of the park remains open overnight.

[73] The ACLT is a 10-mile-long picturesque loop along the east and west shores of the Columbia River in the Wenatchee and East Wenatchee areas. It is well used for walking, jogging, skating and riding bicycles. The ACLT is a series of connecting pedestrian and bicycle paths that is co-owned and co-managed by Chelan PUD, the city of Wenatchee, Washington State Department of Transportation, Douglas County, and the Washington State Parks and Recreation Commission. The ACLT meanders both inside and outside of the Rock Island Project Boundary. Chelan PUD owns and operates only the segments of the ACLT that are within the Rock Island Project FERC-approved recreation sites. Where the ACLT is not within a FERC-approved recreation site under the Rock Island Project Recreation Plan, it is not considered a Rock Island Project feature or a Rock Island Project-approved recreation amenity; see Section 5.6.3.1 for details.

Figure 5.6-2 Wenatchee Confluence State Park

Wenatchee Confluence State Park North

Wenatchee Confluence State Park North (Photo 5-3) requires a fee and primarily consists of a designated campground, hard-surface two-lane boat launch and preparation area, swimming area, and multiple picnic facilities including grills. This area also includes approximately 1.95 miles of the ACLT, which allows for foot-traffic and cycling. Fishing is allowed during open season. The campground consists of eight standard campsites and 51 full-hookup recreational vehicle (RV) sites, one group site, and a dump station. All sites include a picnic table and a firepit/ring. Visitors have access to restrooms, benches, water fountains, bike racks, and trash receptacles. Restrooms include urinals for the men, and Americans with Disabilities Act (ADA) compliant flush toilets and showers stalls for both men and women. A sports field is available for activities such as football, baseball, and rugby with goal posts. Sports courts within the park include tennis, basketball, and pickleball. For added recreation, the park provides volleyball courts, horseshoe pits, picnic shelters and ADA compliant playgrounds. There is parking for approximately 72 vehicles with trailers, 176 without trailers, and 11 ADA parking spots within five lots. The ACLT is ADA accessible throughout the park. There are signs marking boating safety, Rock Island Project information, pet policies, Washington State Park access pass options, and bicycling rules, in both English and Spanish.

Photo 5-3 Walking Trail and Amenities at Wenatchee Confluence State Park North

Wenatchee Confluence State Park South

Wenatchee Confluence State Park South (Photo 5-4) primarily consists of the HNA. The HNA is managed as a passive recreation area that is protected for its unique location, serenity, cultural

resources, and environmental features, and is a popular area for year-round wildlife viewing. Washington State Park staff patrol the HNA and perform maintenance, as necessary. No fee is required to visit the HNA. Parking is provided near the entrance of Wenatchee Confluence State Park North and available for recreationists to use and walk to the HNA via the ACLT pedestrian bridge that spans the Wenatchee River. Recreationists can also park at Walla Walla Point Park and walk to the HNA via the ACLT. Visitors have access to an ADA compliant pit toilet restroom, trash receptacles, benches, bicycle racks and nature viewing areas. The Horan Nature Trail is an approximately 1.35-mile pedestrian only loop gravel trail connected to the ACLT. The trail includes interpretive signage. The HNA is open year-round, however, portions of the trail system can be closed intermittently to protect sensitive wildlife.

Photo 5-4 Trail in Horan Natural Area at Wenatchee Confluence State Park South

5.6.2.2 Walla Walla Point Park

The ACLT continues south from Wenatchee Confluence South along the west side of the Columbia River and into Walla Walla Point Park (Photo 5-5). Walla Walla Point Park includes an

approximately 1.2-mile-long segment of the ACLT. The site is also accessible to vehicles via Walla Walla Avenue, a two-lane paved road, as well as via stairs and a path from a nearby hotel and its parking area. Chelan PUD owns and manages the site, which operates from dawn until dusk, year-round; operational times may vary seasonally and public access to the park is free. Walla Walla Point Park primarily consists of an illuminated multi-sport field complex, providing for a multitude of sporting activities such as softball, baseball, soccer, football, and lacrosse. There are also several picnic areas, a scenic overlook, a pet relief area, a sandy beach with a designated swim area, and art installations. Picnic areas include electricity, water, and sinks. Visitors have access to picnic tables, benches, trash receptacles, water fountains, and grills. Restrooms include urinals for the men, and ADA compliant flush toilets for both men and women. Sports courts are available for basketball, pickleball, and handball. There are also two volleyball courts available for recreationists. An ADA compliant playground, and adult fitness stations are also available. There are safety, informational, and educational signs throughout the site in English and Spanish. Benches, multi-use sports fields and courts, water fountains, restrooms, picnic facilities, and trash receptacles provided are suitable for persons with disabilities to participate in recreation opportunities. The Wenatchee Row and Paddle Club (WRPC) operates and maintains a non-Project recreation amenity that provides public access to the reservoir, details provided in Section 5.6.3.2. The park includes four parking lots with capacity for approximately 420 vehicles without trailers and 18 ADA vehicles.

On May 17, 2023, Chelan PUD filed an application to amend the approved Rock Island Project Recreation Plan to incorporate a new sports court and trail section within Walla Walla Point Park. On July 6, 2023, FERC issued an Order approving the amendment to the Rock Island Project Recreation Plan.

Figure 5.6-3 Walla Walla Point Park

Source: Chelan PUD 2021

Photo 5-5 Walla Walla Point Park

5.6.2.3 Wenatchee Riverfront Park

The ACLT continues south from Walla Walla Point Park along the west side of the Columbia River into Wenatchee Riverfront Park. The ACLT within Wenatchee Riverfront Park is approximately 1.1 miles long. The site is accessible to vehicles via Riverside Drive, and the entrance consists of a two-lane paved road. The city of Wenatchee and Chelan PUD owns and manages the site, which operates from dawn until dusk, year-round; operational times may vary seasonally and public access to this site is free. The Wenatchee Riverfront Park primarily consists of an interactive art and garden walk along the ACLT (Xeriscape Demonstration Garden), as well as several picnic areas and a boat launch. A boat dock is accessible alongside the boat launch (Photo 5-6). There is also a day use boat moorage dock just upstream from the boat launch parking area. Through an agreement with Chelan PUD, the city of Wenatchee installs and maintains art installations along the ACLT. The park includes a mini railroad featuring a locomotive display, railroad interpretive sign, and steam train demonstration (non-Project recreation, not managed by Chelan PUD). Visitors have access to picnic tables, benches, trash receptacles and water fountains. Restrooms include urinals for the men, and ADA compliant flush toilets for both men and women. There is parking for approximately 20 vehicles with trailers, 156 without trailers, and four ADA vehicles within five lots. Bike racks are available within the park as well. There are signs marking the information about the garden, park rules and regulations (including Part 8 details),[74] and safety information in both English and Spanish. Benches, water fountains, bike racks, picnic facilities, and trash receptacles provided are suitable for persons with disabilities to participate in recreation opportunities.

Source: Chelan PUD 2021

Photo 5-6 Riverfront Boat Launch

[74] 18 CFR § 8.2 Posting of project lands as to recreational use and availability of information: https://www.ecfr.gov/current/title-18/chapter-I/subchapter-B/part-8/section-8.2.

The Xeriscape Demonstration Garden is vegetated by native drought tolerant shrubs and flowers with informative placards describing plant details. The Xeriscape Demonstration Garden provides a showcase for more than 70 varieties of low-water-use plants and grasses.[75] The garden was designed and planted by the Washington State University Chelan-Douglas County Extension Master Gardeners and is maintained by volunteers. Chelan PUD co-sponsors the garden. The Xeriscape Garden serves as an exhibit to members of the public about the benefits of growing plants that are native to the regional microclimate (Photo 5-7).

On April 17, 2023, Chelan PUD filed an application to amend the approved Rock Island Project Recreation Plan to add eight conceptual recreation facilities and enhancements to Wenatchee Riverfront Park. On July 20, 2023, FERC issued an order approving the amendment to the Rock Island Project Recreation Plan.

[75] Riverfront Park Demonstration Garden: https://www.chelanpud.org/conservationhome/water-conservation/xeriscape/riverfront-park-demonstration-garden.

Figure 5.6-4 Wenatchee Riverfront Park

Source: Chelan PUD 2021

Photo 5-7 Native Plants and Shrubs Grown on Chelan PUD Portion of ACLT

5.6.2.4 Kirby Billingsley Hydro Park

Kirby Billingsley Hydro Park (Photo 5-8) is located on the east side of the Columbia River. The park is accessible to vehicles via a two-lane paved road and a pedestrian and bicycle trail extension from the ACLT to the north side of the site. Chelan PUD does not manage the trail extension, and it is not considered part of the FERC-approved Rock Island Project Recreation Plan. Chelan PUD owns and manages the site, which operates dawn until dusk, year-round; operational times may vary seasonally. The site primarily consists of a two-lane boat launch, picnic areas, sports courts that consist of tennis, pickleball, basketball and volleyball, multi-use lighted sports fields with benches, and designated swimming area with a sandy beach. Visitors have access to benches, grills, bleachers, picnic tables, trash receptacles, and water fountains. Restrooms include urinals for the men, and ADA compliant flush toilets for both men and women. There is parking for approximately 33 vehicles with trailers, 244 without trailers, and 6 ADA vehicles. There are signs marking park information, history and directions, safety, and beach rules in both English and Spanish. Benches, signage kiosks, picnic shelters, sports fields, water fountains, and trash receptacles provided are suitable for persons with disabilities to participate in recreation opportunities.

Figure 5.6-5 Kirby Billingsley Hydro Park

Source: Chelan PUD 2021

Photo 5-8 Ballfields and Swimming Area at Kirby Billingsley Hydro Park

5.6.2.5 Coyote Dunes Natural Area

The Coyote Dunes Natural Area (Figure 5.6-6) is located on the east side of the Columbia River, in Douglas County, approximately 17 miles north of the Rock Island Dam. The 26-acre site operates as a designated natural trail system and river viewing area with informational and safety signage in English and Spanish. The trail system is comprised of approximately 1.2 miles of authorized trails. The site is accessible via the ACLT. Chelan PUD owns and manages the site, per the Coyote Dunes Management Plan. The site operates from dawn until dusk, year-round; operational times may vary seasonally.

As discussed above, FERC's 1979 Order approving the Rock Island Project Recreation Plan reserved the site, which was formerly known as the Olds Station Bridge site, for future recreational development. The site extends south of State Route 2 east of the Richard Odabashian Bridge. The entire 49-acre parcel of land proposed for this development was owned by the Washington State Department of Transportation (WSDOT) (FERC 2018). WADNR owns the sandy beach and much of the shoreline area near Coyote Dunes Natural Area (Chelan PUD 2017a).

At the time of the 1978 Plan development, the site was scheduled to be part of a major highway interchange planned by WSDOT. Subsequently, WSDOT highway development plans changed substantially, and WSDOT decided to sell the lands not needed for the roadway interchange. In 2017, Chelan PUD began planning to purchase approximately 26 acres of land south of the Richard Odabashian Bridge from WSDOT. On January 9, 2018, Chelan PUD filed an Application for a Non-Capacity Amendment to revise the Exhibit R Recreation Plan (which, as noted above, was approved by FERC on March 18, 2018 (2018 Order) to make the following changes:

- Per public process, change the site name from Olds Station Bridge to Coyote Dunes Natural Area (Figure 5.6-6);
- Revise the Rock Island Project Boundary to include 26 acres designated as passive recreation area; and
- Remove approximately 23 acres from the originally described site from the Rock Island Project Boundary.

On March 15, 2023, FERC approved the Coyote Dunes Natural Area Management Plan, which describes measures to protect and preserve unique habitats and sensitive species, provide passive public recreation opportunities (i.e., walking trails, connection to the ACLT, a beach area, and interpretive and public safety signage), and protects cultural resources located in the Coyote Dunes Natural Area.

Figure 5.6-6 Coyote Dunes Natural Area

5.6.3 Non-Rock Island Project Public Recreation Sites within the Rock Island Project Boundary

In addition to the five FERC-approved Rock Island Project recreation sites, there are numerous non-Project public recreation opportunities (Figure 5.6-7) within the Rock Island Project Boundary. The following sections summarize the recreation opportunities within the Rock Island Project Boundary that are not part of the FERC-approved Rock Island Project Recreation Plan.

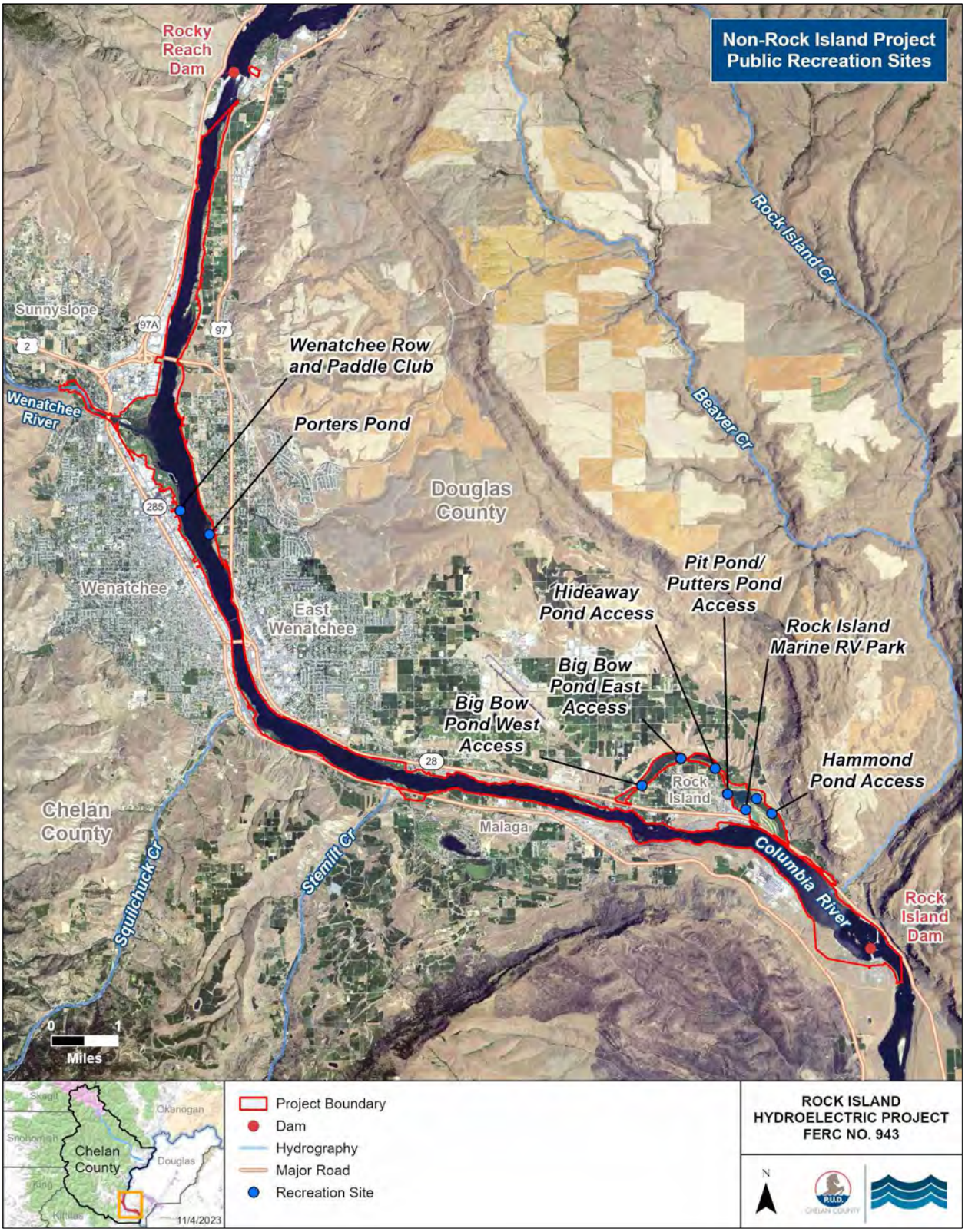

Figure 5.6-7 Non-Rock Island Project Public Recreation Sites within the Rock Island Project Boundary

5.6.3.1 Apple Capital Loop Trail

The 10-mile ACLT (Figure 5.6-8 and Photo 5-9) is a bidirectional series of connecting pedestrian and bicycle paths co-owned and co-managed by Chelan PUD, the city of Wenatchee, WSDOT, Douglas County, and the Washington State Parks and Recreation Commission. Chelan PUD owns and operates only the portions of the ACLT that are within recreation sites under the FERC-approved Rock Island Project Recreation Plan.

Mile marker 1 of the ACLT is located in the Chelan-managed portion of the ACLT where Worthen Street and Orondo Avenue intersect in front of the Pybus Public Market. Heading northwest, the ACLT proceeds through Wenatchee Riverfront Park and into Walla Walla Point Park (at mile marker 2). Consistent with the Rock Island Project license, Chelan PUD manages both the 1.1-mile portion of the ACLT in Wenatchee Riverfront Park, and a 1.2-mile portion in Walla Walla Point Park.

Prior to mile marker 3, the ACLT enters Wenatchee Confluence State Park and is managed by the Washington State Parks and Recreation Commission. Washington State Parks, through an agreement with Chelan PUD, manages the 1.95-mile portion of the trail in this park. Between mile markers 5 and 6, recreationists cross the Richard Odabashian Bridge, managed by the WSDOT.

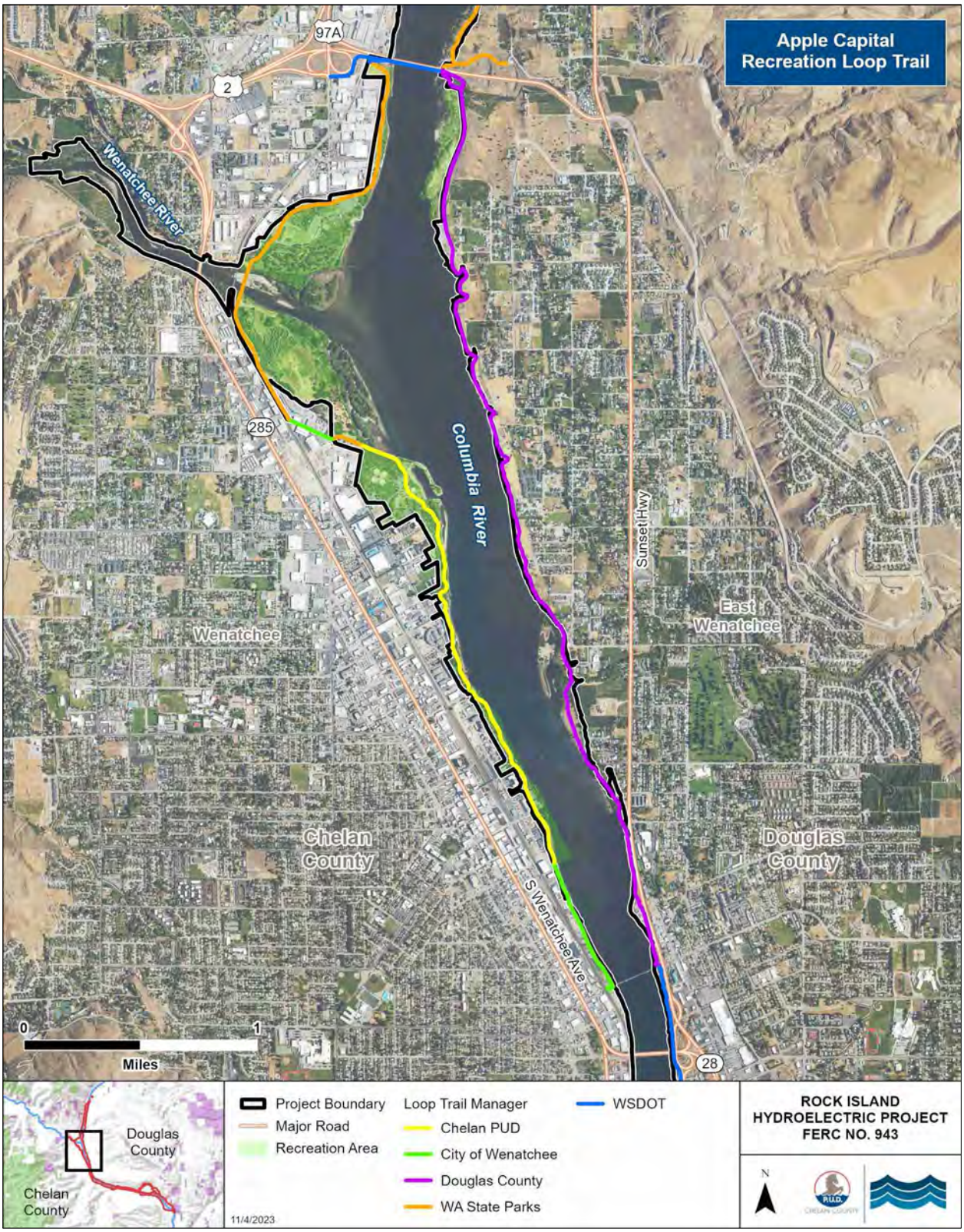

Figure 5.6-8 Apple Capital Loop Trail Map with Management Details

Source: Kleinschmidt 2021

Photo 5-9 Apple Capital Loop Trail Looking Southeast

Heading southeast, recreationists continue the loop on the east side of the Columbia River, near East Wenatchee. From mile marker 6 to approximately mile marker 10, the ACLT is managed by Douglas County. The ACLT continues towards the Hale Park/Dog Park on the west side of Wenatchee, where recreationists pass another portion of the loop managed by the city of Wenatchee, before reconnecting with the Riverfront Park portion of the ACLT.

There are two spur trails from the ACLT that connect Rock Island Project recreation sites to over 20 miles of additional paved trail throughout the Wenatchee Valley (Chelan PUD 2017b). The first spur trail connects Coyote Dunes Natural Area to Lincoln Rock State Park via a 5-mile paved, mixed use, ADA-accessible trail. The second spur trail connects Kirby Billingsley Hydro Park with the ACLT via a 2.2-mile trail to the north that ties into the ACLT at Old Wenatchee Bridge.

5.6.3.2 Wenatchee Row and Paddle Club

The WRPC owns and maintains (through an agreement with Chelan PUD) a publicly accessible non-motorized boat launch with access to the Columbia River within Walla Walla Point Park (Figure 5.6-7). The WRPC maintains a Chelan PUD owned boathouse within Walla Walla Point Park, which is available to its members for storage or access to over 25 club-owned boats (WRPC 2022).

5.6.3.3 Porters Pond

Porters Pond, an area of the Columbia River that creates a small pond of calm water on the east shoreline of the reservoir (Figure 5.6-7). The pond is located near the city of East Wenatchee within the Rock Island Project Boundary and is owned and managed by the city of East Wenatchee, Douglas County and WADNR. An informational kiosk is located at the site where it connects to the ACLT. Several foot paths provide access to the water. A sitting area is provided away from the water that is accessible from a footpath near the ACLT.

5.6.3.4 Big Bow Pond

Big Bow Pond is located near the city of Rock Island and has two access points at the east and west ends of the lake (Figure 5.6-7). Chelan PUD owns and manages both access points. The eastern point of entry consists of two unpaved lanes accessed via Center Street on the northeast side of the pond. Visitors have access to a trash receptacle, one portable restroom, a concrete non-motorized boat launch, and informational signage. The site is available year-round. An unpaved gravel lot allows parking for approximately 15 vehicles. The western point of entry consists of two paved lanes, accessed via Rock Island Road on the southwest side of the pond. Visitors have access to a trash receptacle, one portable restroom, a gravel surfaced non-motorized boat launch, and informational signage. An unpaved gravel lot allows parking for approximately 12 vehicles. The site is available year-round.

5.6.3.5 Hideaway Pond

Hideaway Pond is located near the city of Rock Island and has one access point on the east end of the lake (Figure 5.6-7). Chelan PUD owns the pond access site and Douglas County owns the access road and parking lot. Access to the pond is available via Idaho Avenue and an unpaved two-lane gravel entrance. Visitors have access to a trash receptacle, a gravel surfaced non-motorized boat launch, and one portable restroom. A gravel parking lot allows for approximately 12 vehicles. The site is available year-round.

5.6.3.6 Pit Pond/Putters Pond

Pit Pond and Putters Pond are located within the city of Rock Island and are accessible via an unpaved extended entrance on the northwest shoreline with two lanes that run between the two ponds via Saunders Avenue (Figure 5.6-7). The site is owned and managed by the city of Rock Island. The site consists of water access for non-motorized boats, informational signage, a trash receptacle, and four portable restroom facilities. Visitors have access to this site year-round.

5.6.3.7 Rock Island Golf Course

The Rock Island Golf Course is located southeast of Putters Pond (Figure 5.6-7) within the city of Rock Island. The golf course is owned by the city of Rock Island and leased to/managed by Alta Lake Golf, Inc. Land ownership consists of the city of Rock Island, Chelan PUD, and a private entity. Chelan PUD ownership is in land only, and the PUD has a use permit agreement with the city of Rock Island to operate the golf course.

5.6.3.8 Hammond Pond

Hammond Pond is located within the city of Rock Island and is accessible on the north side via a paved entrance with two lanes off Saunders Place Road (Figure 5.6-7). The site is owned by the city of Rock Island and managed by the Rock Island Ski Club. Visitors have access to a gravel surfaced boat launch as well as a trash receptacle. The site is available year-round. A gravel lot allows for parking for approximately seven vehicles.

5.6.3.9 Rock Island Marine Recreational Vehicle Park

The Rock Island Marine RV Park is located within the city of Rock Island on the southeast side of Putters Pond and is accessible via Parkway Drive (Figure 5.6-7). This campground is privately owned and operated.

5.6.4 Public Recreation Areas Surrounding the Rock Island Project

While the sections described above featured recreation sites located within the Rock Island Project Boundary, opportunities for outdoor recreation are equally abundant in the area surrounding the Rock Island Project (Table 5.6-3, Figure 5.6-9 and Figure 5.6-10). Situated at the base of the Cascade Mountain Range along the Columbia River, recreation areas located within Chelan, Douglas, and Grant counties offer a multitude of recreational opportunities for visitors and residents. The following table and figures highlight public recreation areas that are within approximately a 1-hour drive, or up to 60 miles, of the Rock Island Project. For further information about each recreation area, please see the Recreation Inventory Study (Appendix G.6).

Table 5.6-3 Public Recreation Opportunities Within 1-Hour Drive or 60 Miles of the Rock Island Project

COUNTY	SITE NAME
Chelan County	Wenatchee Foothills Trails
	Centennial Park
	Chase Park
	Hale Park
	Kiwanis Methow Park
	Lincoln Park
	Lions Locomotive Park
	Pennsylvania Park
	Pioneer Park
	Rotary Park
	Washington Park
	Western Hills Park
	Malaga Community Park
	Swakane Wildlife Area
	Yoyo Rock Boat Launch
	Squilchuck State Park
	Peshastin Pinnacles State Park
	Entiat Park
Douglas County	Eastmont Community Park
	Kenroy Park
	Tedford Park
	Lincoln Rock State Park
	Orondo Park
	Apricot Orchard Boat Launch
	Daroga State Park
Grant County	Crescent Bar Recreation Area

Source: Kleinschmidt 2023

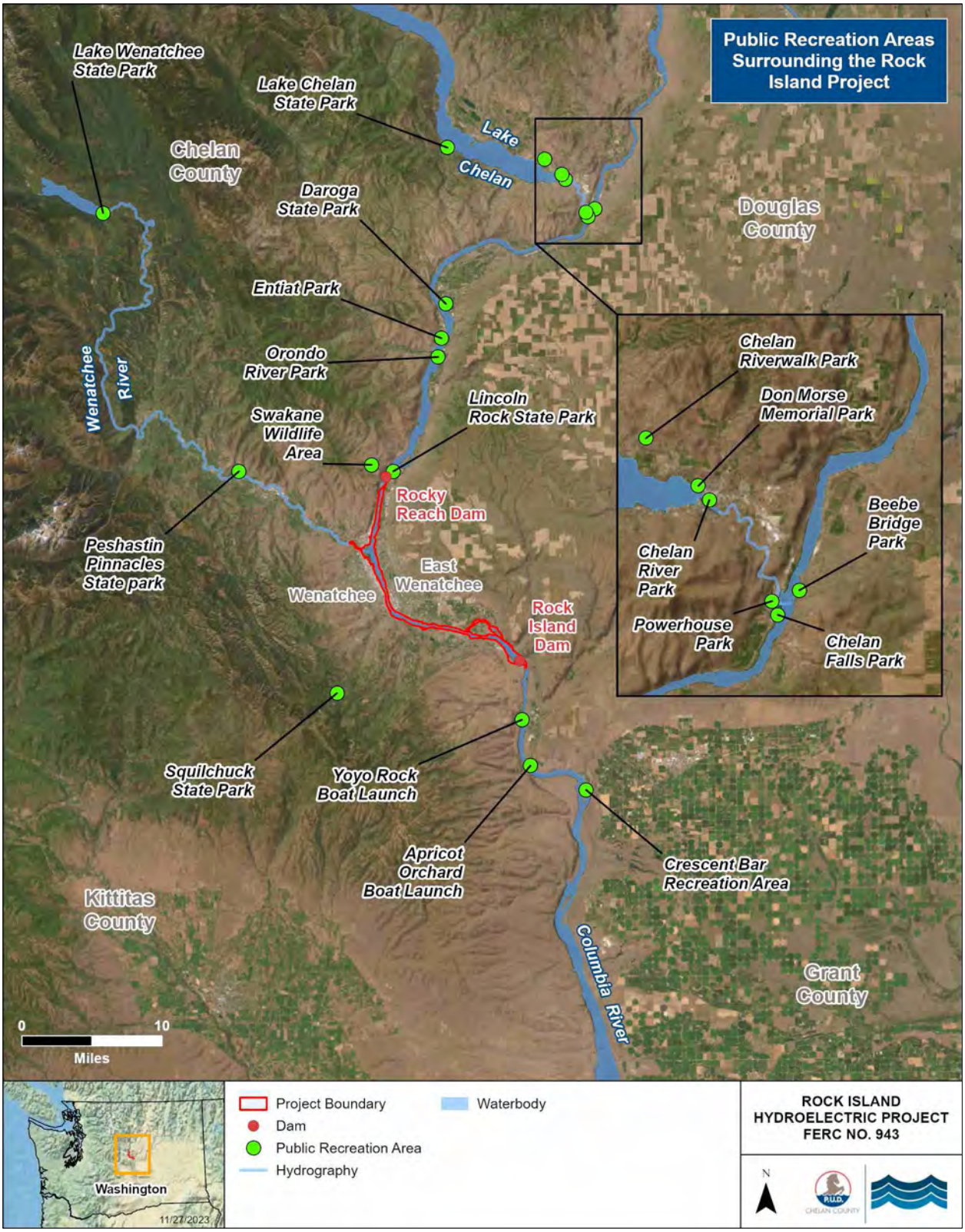

Figure 5.6-9 Public Recreation Areas Surrounding the Rock Island Project

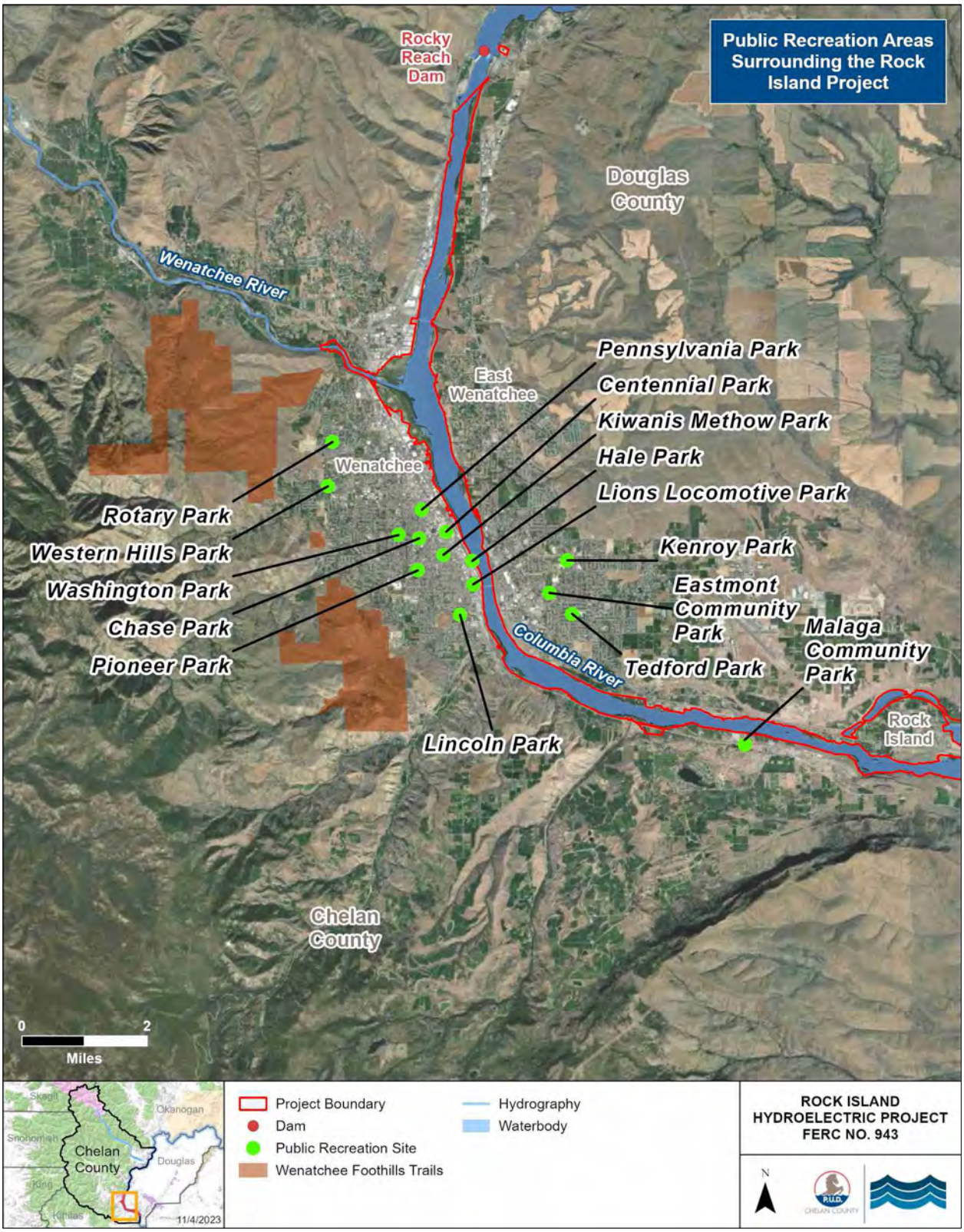

Figure 5.6-10 Public Recreation Areas Surrounding the Rock Island Project (Wenatchee and East Wenatchee Detail)

5.6.5 Recreation Use and Needs

Until 2019, per FERC Order 852, effective March 28, 2019, licensees were required to file the *Licensed Hydropower Development Recreation Report*, FERC Form No. 80 (Form 80) report for each project development every 6 years, unless the licensee obtained an exemption from FERC. Chelan PUD last filed the Form 80 with FERC, as required, on April 2, 2015.[76] The information provided by Chelan PUD was used to document overall recreational use of Rock Island Project lands and waters, as well as recreational use at all publicly available recreational amenities within the Rock Island Project Boundary, whether required by a license or not. Based on data collected during the previous FERC Form 80, Table 5.6-4 shows the amenities available at the Rock Island Project along with their associated capacity.

Table 5.6-4 2015 Form 80 Results

RECREATION AMENITY TYPE	NUMBER OF FERC-APPROVED RECREATION AMENITIES	TOTAL UNITS	CAPACITY UTILIZATION (PERCENT)
Boat Launch Areas	3	5 lanes	43
Reservoir Fishing	4		3
Swim Areas	3	5 acres	2
Trails	1	10 miles	21
Active Recreation Areas (e.g., playgrounds, ball fields, jogging tracks)	3	57 acres	22
Picnic Areas	4	11 sites	12
Overlooks/Vistas	2	1 acre	1
Campgrounds	1	23 acres	
Campsites	59		97
Group Camps	1	1 site	70
Access Points	2		2
Other	3	5.6	2

Source: Chelan PUD 2015

Since the discontinuation of the FERC Form 80 report, Chelan PUD has continued to collect use data at four of their facilities using traffic counters (Wenatchee Confluence State Park, Walla Walla Point Park, Wenatchee Riverfront Park, and Kirby Billingsley Hydro Park). Based on the traffic counter data, Chelan PUD used a multiplier of 2.5 to determine the number of visitors for Walla Walla Point Park, Wenatchee Riverfront Park, and Kirby Billingsley Hydro Park. For Wenatchee Confluence State Park, a multiplier of 3.5 was used to determine the number of visitors. From 2016-2020 there was an average of 483,184 visitors recorded per year. The most frequented

[76] FERC Accession Number 20150402-5151.

facility was Wenatchee Riverfront Park which had an average of 708,716 visitors per year from 2016-2020. The facility visited least frequently was Kirby Billingsley Hydro Park, which had an average of 189,124 visitors per year from 2016-2020.

5.6.5.1 Recreation Needs Identified in Management Plans

The 2023 Recreation and Conservation Plan for Washington State is the State Comprehensive Outdoor Recreation Plan (SCORP). The 2023 SCORP builds upon concepts and updates from the 2018-2022 Washington State Recreation and Conservation Plan (WSRCO 2023).

The Washington State Recreation and Conservation Office (WSRCO) commissioned a research team from Eastern Washington University (EWU) to conduct the 2022 Assessment of Outdoor Recreation Demand to assess demand and satisfaction with recreation opportunities in Washington State (WSRCO 2023). The participation rates for the top-ten outdoor recreation activities in Washington are presented in Table 5.6-5. EWU divided Washington into 10 regions, with Chelan County making up a portion of the North Cascades Region, and Douglas County a portion of the Columbia Plateau Region.

Table 5.6-5 Resident Participation Rates of the Top Ten Outdoor Recreation Activities

OUTDOOR RECREATION ACTIVITY	WASHINGTON STATE (PERCENT)	COLUMBIA PLATEAU REGION (PERCENT)	NORTH CASCADES REGION (PERCENT)
Walking (or using a mobility device) on Roads/Sidewalks	91	88	92
Walking/Day Hiking (or using a mobility device) on Trails	90	86	91
Wildlife/Nature Viewing	85	84	87
Scenic Driving and Sightseeing	85	89	86
Hanging Out	70	71	71
Picnic, BBQ, or Cookout	68	84	70
Community Garden or Farmers' Market	66	66	67
Visiting Outdoor Cultural/Historical Facilities and Attending Cultural Events	62	61	62
Swimming in a Natural Setting	61	72	66
Paddle Sports	52		56

Source: EWU 2017

In addition, EWU found that 75.8 percent of residents indicated they will continue to participate in all of their recreation activities from the year prior, 17.2 percent indicated they will participate in most of their recreation activities from the year prior but not all, 4.4 percent indicated they will continue to participate in some of their recreation activities from the year prior but not all, 0.5

percent indicated they will not participate in any of the recreation activities from the year prior, and 2.2 percent indicated they were undecided (EWU 2017).

The 2023 SCORP noted that residents and visitors spent nearly 600 million user-days recreating in 2019. Direct spending on outdoor recreation exceeds $26.5 billion to the state's economy annually. In addition, the state of Washington population is predicted to increase by nearly 2 million residents by 2050. The plan's goal is to ensure that the recreation and conservation needs of current and future populations are met by focusing on four core values: (1) provide meaningful access to outdoor recreation for all; (2) protect natural and cultural resources while managing increasing demand; (3) demonstrate the essential nature of parks, natural areas, and recreation infrastructure; and (4) support healthy, adaptable, and connected communities (WSRCO 2023).

5.6.5.2 Fishing and Boating

Beyond recreational use of the shorelines and adjacent lands, the Rock Island Reservoir is popular for general fishing and boating activities. As discussed in the previous sections, there are three public boat launches providing access to the Rock Island Reservoir, all of which are owned by Chelan PUD. Chelan PUD operates both Kirby Billingsley Hydro Park and Wenatchee Riverfront Park; however, Wenatchee Confluence State Park – including the boat launch – is operated and maintained under an agreement with the Washington State Parks and Recreation Commission (Table 5.6-6). All boat launches are operational throughout the operating range of the Rock Island Project. As river conditions may change, Chelan PUD provides real time data to the public regarding current reservoir levels, flows, water temperature, and the status of Chelan PUD-owned boat launches on both its website and the free *Currents* app (Chelan PUD 2017c).

Table 5.6-6 Public Boat Launches on the Rock Island Reservoir

SITE NAME	SITE MANAGER	# OF CONCRETE RAMPS
Kirby Billingsley Hydro Park	Chelan PUD	2
Wenatchee Confluence State Park[1]	WA State Parks	2
Wenatchee Riverfront Park	Chelan PUD	2

Source: Chelan PUD 2017d
[1]Fee or Discover Pass required

Based on data collected by Chelan PUD from 2016 to 2020 there were an average of 37,808 launches at Kirby Billingsley Hydro Park and 77,822 launches at Wenatchee Riverfront Park per year, respectively. Data for the number of launches at Wenatchee Confluence State Park were not collected during 2016-2020.

For hand-launched crafts such as kayaks, portage is available around both Rocky Reach and Rock Island dams, as indicated by appropriate signs at each take out and put in location. Traveling

downstream, portage around Rocky Reach Dam is available at the boat launches for Lincoln Rock State Park (take out) and Wenatchee Confluence State Park (put in). Portage around Rock Island Dam is available at the boat launches for Kirby Billingsley Hydro Park (take out) and Crescent Bar (put in) (Chelan PUD 2017d and 2017e).

Whether from the banks of the reservoir or a launched vessel, the Rock Island Reservoir is a popular recreational fishery.

5.6.6 Regionally or Nationally Important Recreation Areas

5.6.6.1 Wilderness Areas

There are no designated Wilderness Areas located within or near the Rock Island Project. There are Wilderness Areas within the region of the Rock Island Project, including the Lake Chelan-Sawtooth Wilderness, approximately 120 miles north of the Rock Island Dam. Located within Okanogan-Wenatchee National Forest, the Lake Chelan-Sawtooth Wilderness area consists of over 153,000 acres of forest, meadows, alpine slopes, and high country; and approximately 194 miles of trails and 18 trailheads. Recreation activities include hiking, horseback riding, and camping (USFS 2021d).

The Alpine Lakes Wilderness area is located approximately 110 miles from the Rock Island Dam within the Mt. Baker-Snoqualmie National Forest. The Alpine Lakes Wilderness area covers approximately 394,000 acres, and offers 47 trailheads and 615 miles of trails, including 67 trail miles of the Pacific Crest National Scenic Trail (PCT). The Enchantments are located within this wilderness area and are known for superb hiking and climbing. The Alpine Lakes Wilderness area entails a diverse landscape with over 700 lakes, glacier-carved mountain peaks, tree-covered valleys, and mountain meadows (USFS 2021e).

The Wild Sky Wilderness area is located approximately 95 miles northwest of the Rock Island Dam within the Mt. Baker-Snoqualmie National Forest. The Wild Sky Wilderness area was designated by Congress in 2008. It totals approximately 106,000 acres and offers opportunities for fishing, hiking, horse riding, and camping (USFS 2023a).

The Glacier Peak Wilderness area is located approximately 80 miles northwest of the Rock Island Dam and covers approximately 566,000 acres. It offers approximately 100 trails totaling 450 miles, including approximately 60 trail miles of the PCT. The Ptarmigan Traverse is located across 15 miles of the northern section of the Glacier Peak Wilderness area and is famous for its combination of glacier travel and rock-climbing opportunities (USFS 2023b).

5.6.6.2 National Park Service

There are no units of the National Park System (NPS) within or near the Rock Island Project. The NPS land nearest to the Rock Island Project is the 61,949-acre Lake Chelan National Recreation Area, located approximately 105 river miles upstream of the Rock Island Dam in the headwaters of Lake Chelan, west of the city of Chelan. The area is remote and only accessible by foot, boat, or plane (AllTrips 2021). The Stehekin River flows through the North Cascades National Park emptying into Lake Chelan and provides kayaking, whitewater rafting, and fly-fishing opportunities. The northernmost 4 miles of Lake Chelan are within the national recreation area (Washington State Parks 2021). The recreation area offers fishing, boating, and lakeshore camping as well as ranger-led explorations, interactive programs, and educational presentations (National Park Service 2023). Hiking trails range from easy to strenuous and include views of a spring-fed waterfall, the Stehekin River and Valley, and Lake Chelan, one of the nation's deepest lakes with a depth of 1,500 ft (AllTrips 2021; National Park Foundation 2023). In addition, private companies offer guided whitewater rafting and rock-climbing excursions.

5.6.6.3 National Trail System

No trails are designated as part of the National Trail System within the Rock Island Project Boundary. The nearest national trail to the Rock Island Project is the PCT, which traverses along the eastern side of the North Cascades through Okanogan-Wenatchee National Forest, approximately 40 miles west of Rock Island Project. The PCT extends approximately 2,650 miles from the Canadian border through Washington, Oregon, and California until reaching the Mexico border. The PCT is one of 11 national scenic trails and is considered one of the most remote long-distance trails, with over 54 percent of its path in designated wilderness (PCTA 2022a; 2022b). Approximately 940 miles of trail, including 26 miles of the PCT, are designated wilderness in the Okanogan-Wenatchee National Forest. An additional 615 miles of trails on the Okanogan-Wenatchee National Forest are outside of the wilderness designation, including 37 miles of the PCT (USFS 1989).

5.6.7 Other Recreation Sites in the Region

5.6.7.1 Bureau of Land Management and U.S. Bureau of Reclamation

BLM-owned lands and associated recreation sites are scattered throughout lands directly east of the Rock Island Project and include the Rock Island Creek Watchable Wildflowers (approximately 15 miles northeast), Duffy and Douglas Creek Recreation sites within the Duffy-Douglas Creek Unit (approximately 15 miles northeast), and the Moses Coulee Unit which includes the Hungate Canyon Trailhead (approximately 15-25 miles northeast). The Duffy and Douglas Creek Recreation

sites offer dispersed camping, hiking, horseback riding, fishing, wildlife viewing, and hunting opportunities (BLM 2020).

5.6.7.2 United States Forest Service

The nearest USFS lands to the Rock Island Project are the Okanogan-Wenatchee (Okanogan-Wenatchee) National Forest (approximately 70 miles northwest) and the Mount Baker-Snoqualmie National Forest (Mt. Baker-Snoqualmie) (approximately 75 miles northwest). The Okanogan-Wenatchee spans 3.8 million acres along the eastern slopes of the Cascade Range in Washington. Recreation at Okanogan-Wenatchee includes hiking, camping (developed or backcountry), fishing, hunting, horseback riding, mountain biking, off-road vehicle use, and climbing as well as winter activities such as skiing (cross-country and downhill) and snowmobiling (USFS 2021a). Located on the western slopes of the Cascade Mountain Range, Mt. Baker-Snoqualmie covers over 1.7 million acres extending from Seattle, Washington to Vancouver, British Columbia (USFS 2021b). Recreation at Mt. Baker-Snoqualmie includes bicycling, camping, climbing, fishing, hiking, horseback riding, hunting, nature viewing, off-road vehicle use, outdoor learning, picnicking, scenic driving, and water sports (USFS 2021c).

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5.7 Land Use

As specified 18 CFR § 5.6(d)(3)(viii), this section summarizes readily available information on land use in the surrounding region affected by the Rock Island Project.

5.7.1 Regional Land Use and Management

The Rock Island Project is part of the seven-dam Mid-Columbia River hydroelectric system, located in both Chelan (west of the Columbia River) and Douglas (east of the Columbia River) counties, and extends from the tailrace of Rocky Reach Dam (RM 473.7) approximately 20 miles downstream through the cities of Wenatchee, East Wenatchee, and Rock Island to the Rock Island Dam (RM 453.4) (Figure 3.5-1) (NMFS 2002). Both Chelan and Douglas counties are largely rural and undeveloped, with major populated areas concentrated along the Columbia River in the Wenatchee Valley, including the cities of Wenatchee and East Wenatchee adjacent to the Rock Island Project Boundary (Chelan County 2017, 2019).

Table 5.7-1 summarizes land use designations according to each county's tax parcel GIS data. Chelan County lands are predominantly classified as undeveloped land and water areas (57.72 percent); as well as services, specifically government services (30.47 percent). While Chelan County is large (approximately 1.9 million acres), approximately 78 percent of that land is in federal or state ownership. Most of these lands are within the nationally protected areas of Lake Chelan National Recreation Area, North Cascades National Park, and the Okanogan-Wenatchee National Forest. Populated areas are mostly along the eastern border of the county and adjacent to the Columbia River, such as Wenatchee and Malaga along the shoreline of the Rock Island Reservoir (Chelan County 2017).

Douglas County lands are predominantly classified as Resource Production and Extraction (92 percent) (Table 5.7-1), specifically for dryland agriculture and rural resources. Dryland agriculture includes lands used primarily for grain, feed, and crop production; livestock raising and grazing; and lands in conservation programs. Adjacent to these dryland agriculture resources are lands designated for rural resources, designed to encourage, and maintain the county's rural character. The purpose of this designation is to provide the opportunity for the development, redevelopment, and infill of existing intensely developed rural recreational areas for residential, recreation, and tourist development consistent with the rural character in the vicinity. Uses may include intensification of existing residential development or new development of small-scale recreational or tourist uses, provided uses rely on a rural location and setting and do not encourage urban-type development or services. Most of this land is found on the plateau areas of the county. Much like Chelan County, Douglas County's major populated areas are concentrated

adjacent to the Columbia River on the western border of the county, with the cities of East Wenatchee and Rock Island along the shoreline of Rock Island Reservoir (Douglas County 2021).

Table 5.7-1 Chelan and Douglas County Land Use Classification Percentages

COUNTY LAND USE CLASSIFICATION	DOUGLAS COUNTY (PERCENT)	CHELAN COUNTY (PERCENT)
Resource Production and Extraction	92.00	7.14
Residential	1.58	4.23
Undeveloped Land and Water Areas	5.74	57.72
Services	0.08	30.47
Transportation, Communication, and Utilities	0.26	0.15
Manufacturing	0.02	0.08
Trade	0.02	0.03
Cultural, Entertainment, and Recreational	0.08	0.19

Sources: Chelan County 2017 and Douglas County 2021

Chelan and Douglas counties' land use data were analyzed to provide an approximate representation of land use surrounding the Rock Island Project. As shown in Figure 5.7-1, this analysis results in three land uses dominating the 0.5 mile-area around the Rock Island Project: resource production and extraction (18.5 percent), residential (18.4 percent), and undeveloped land and water areas (42.6 percent). Based on land use, the lands in the Rock Island Project area may be generalized into three distinct sections (listed from upstream to downstream):

- RM 473.7 to RM 469.5: From the upstream-most extent of the Rock Island Project Boundary, just below Rocky Reach Dam, downstream to the Richard Odabashian Bridge, upland areas are largely dominated by undeveloped land and water areas and services (state lands) in the barren foothills to the west of the Columbia River and resource production and extraction (orchards and other agriculture) to the east.
- RM 469.5 to RM 464: Downstream of the Richard Odabashian Bridge, uplands are generally contained within the city boundaries of Wenatchee and East Wenatchee and thus are largely dominated by public parks and trails, as well as residential and trade lands on both sides of the river.
- RM 464 to RM 453.4: Between the southern boundaries of Wenatchee/East Wenatchee and Rock Island Dam, land use generally returns to a dominance by resource production and extraction, mixed with pockets of residential (Malaga and Rock Island); undeveloped

land and water areas (near Rock Island Project); and manufacturing (Alcoa Wenatchee Works)[77].

In 1990, Washington State Legislature passed the Growth Management Act (GMA) requiring fast-growing cities and counties to develop comprehensive plans to manage future population growth (MRSC 2021). Specifically, the GMA requires plans to address urban growth, sprawl, transportation, housing, economic development, property rights, permits, natural resource industries, open space and recreation, environment, citizen participation and coordination, public facilities, historic preservation, and shoreline management (Chelan County 2017). Chelan County is a fast-growing county under the GMA, requiring a comprehensive plan.

The Chelan County Comprehensive Plan includes a Land Use Element that was developed in accordance with the GMA and countywide planning policies. Chelan County's Land Use Element is divided into "sub-elements" relating to land uses (residential, commercial, industrial, and resource-based), open space and recreation, urban growth areas (UGAs), and natural systems/critical areas (Chelan County 2017). Chelan County is unique in that most of the land is owned by government agencies or has a tax-exempt status. Outside of those lands, only 14 percent, (approximately 279,000 acres) of Chelan County lands are currently available or used for development, mostly associated with the UGAs identified near Lake Chelan, the Entiat River, the Wenatchee River, and the Columbia River.

Located in the southeast portion of Chelan County and adjacent to the Rock Island Project Boundary, the city of Wenatchee and the Malaga Limited Area of More Intense Rural Development (LAMIRD) account for the largest populated areas of the county. Several rural areas in Chelan County have isolated areas of commercial or tourist activities and are referenced as a LAMIRD. Resource lands in Chelan County are those used for agriculture, such as orchards, vineyards, organic farms, and row-crops. Rural commercial areas provide necessary services and recreation support, while rural industrial lands support orchard processing and mining (Chelan County 2017).

The Douglas County Countywide Comprehensive Plan developed five land use designations in accordance with the GMA: UGAs, rural lands, resource lands, critical areas, and recreational areas. Each city/town, as well as unincorporated areas where urban services are provided or plan to be provided over a 20-year period, is designated as an urban growth area (1.2 percent), including Greater East Wenatchee and Rock Island; recreational areas also fall within this broader designation. Rural lands (39.1 percent) are those areas outside of UGAs that are not designated

[77] In November 2015, Alcoa announced it was curtailing the Alcoa Wenatchee Works facility in Malaga, laying off approximately 428 employees. The facility permanently closed in 2018.

resource lands of long-term commercial significance. Resource lands (59.7 percent) include agriculture and mineral lands that have been determined as having "long-term commercial significance."

Critical areas are located throughout the county and act as an overlay for administrative purposes, including wetlands, aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas. Recreational areas are located throughout the county. Chelan PUD provides several recreation facilities along the Columbia River including, but not limited to Kirby Billingsley Hydro Park, Lincoln Rock State Park, Daroga State Park, and Beebe Bridge Park (please see Section 5.6 for additional details). There are also several golf courses and regional trail systems in the area.

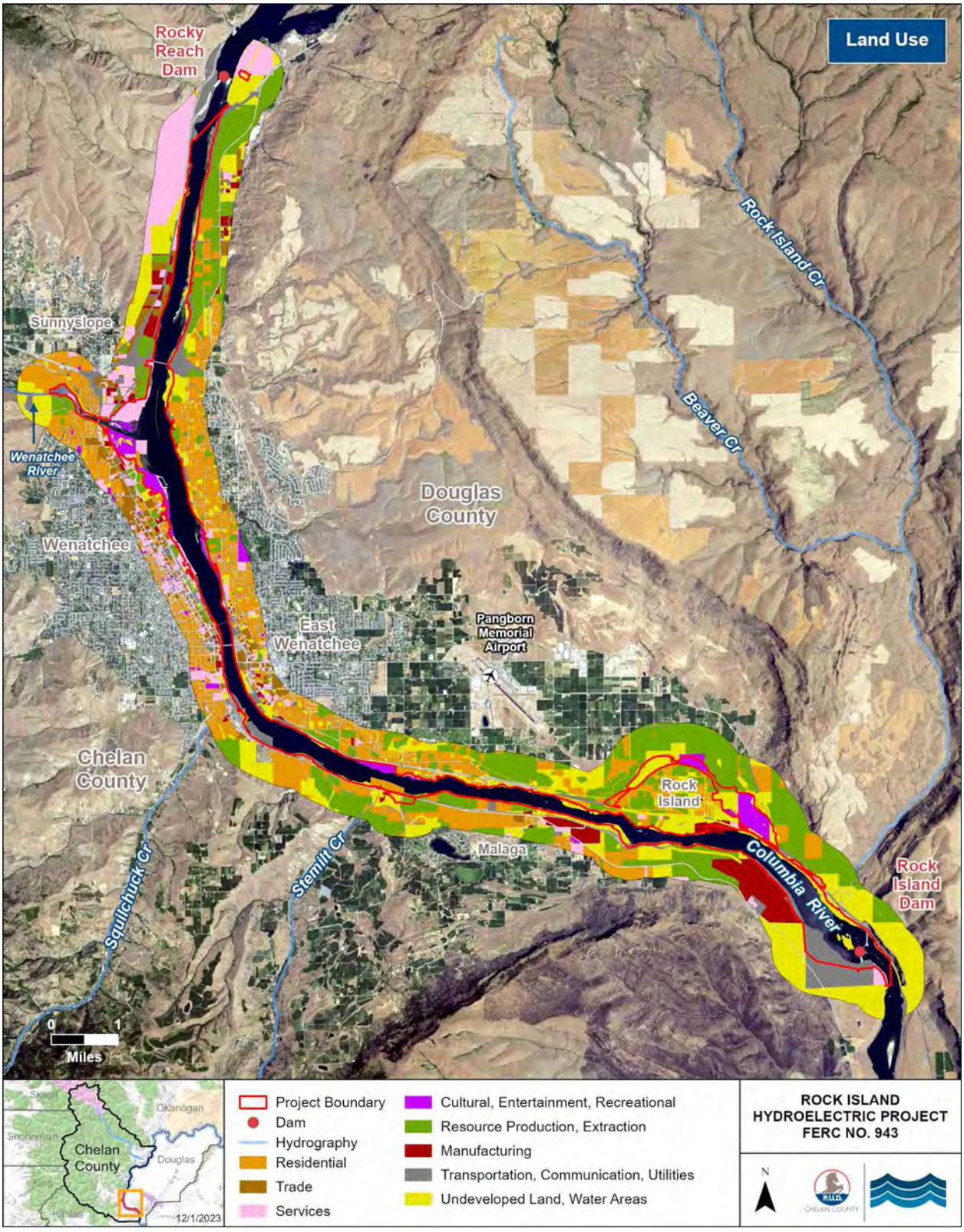

Figure 5.7-1 Land Use in the Rock Island Project Area within 0.5 Mile

5.7.1.1 Land Cover

Land use and cover was estimated by analyzing the Multi-Resolution Land Characteristics Consortium's 2019 National Land Cover Database (NLCD), which provides nationwide data on land cover and land cover change (MRLC 2019). As summarized in Table 5.7-2, the predominant land cover in Chelan County is classified as evergreen forest (44.1 percent), shrub/scrub (22.6 percent), and grassland/herbaceous (19.5 percent). The predominant land covers in Douglas County are classified as shrub/scrub (40.6 percent), cultivated crops (32.2 percent) and grassland/herbaceous (20.0 percent).

An analysis of land cover in the Rock Island Project area was performed, resulting in a predominant land cover of shrub/scrub (18.3 percent); open water (19.0 percent); developed, low intensity (10.7 percent); developed, medium intensity (11.4 percent); developed, open space (7.3 percent); pasture/hay (1.2 percent); 12.8 percent Cultivated Crops; 6.4 percent Developed, High Intensity; and grassland/herbaceous (11.3 percent) (Figure 5.7-2). Open water dominates the area given the footprint of the Columbia River, and to a lesser degree, its confluence with the Wenatchee River. Based on land cover, the lands in the Rock Island Project area may be generalized into three distinct sections (listed from upstream to downstream):

- RM 473.7 to RM 469.5: From the upstream-most extent of the Rock Island Project Boundary, just below Rocky Reach Dam, downstream to the Richard Odabashian Bridge, upland areas are largely dominated by shrub/scrub and grassland/herbaceous in the barren foothills to the west of the Columbia River and a mix of pasture/hay and emergent herbaceous wetlands to the east.
- RM 469.5 to RM 464: Downstream of the Richard Odabashian Bridge, uplands are generally contained within the city boundaries of Wenatchee and East Wenatchee and thus are largely dominated by developed lands on both sides of the river.
- RM 464 to RM 453.4: Between the Wenatchee/East Wenatchee and Rock Island Dam, land cover generally returns to a dominance by shrub/scrub, mixed with a high degree of hay/pasture and cultivated crops and small pockets of developed lands at the city of Rock Island on the north side of the river and Alcoa Wenatchee Works on the west side of the river.

Table 5.7-2 Land Cover Percentages in Chelan and Douglas Counties

NATIONAL LAND COVER DATABASE CLASSIFICATION	CHELAN COUNTY (PERCENT)	DOUGLAS COUNTY (PERCENT)
Shrub/Scrub	22.6	40.6
Open Water	2.6	1.7
Developed, Low Intensity	1.0	1.0
Developed, Medium Intensity	0.6	0.6
Developed, High Intensity	0.2	0.1
Developed, Open Space	1.2	2.0
Cultivated Crops	1.2	32.2
Pasture/Hay	0.4	0.4
Grassland/Herbaceous	19.5	20.0
Emergent Herbaceous Wetlands	0.1	0.1
Woody Wetlands	0.7	0.1
Evergreen Forest	44.1	1.0
Deciduous Forest	0.2	0.0
Barren Land (Rock/Sand/Clay)	4.6	0.1
Mixed Forest	0.3	0.0
Perennial Snow/Ice	0.7	0.0

Source: MRLC 2019

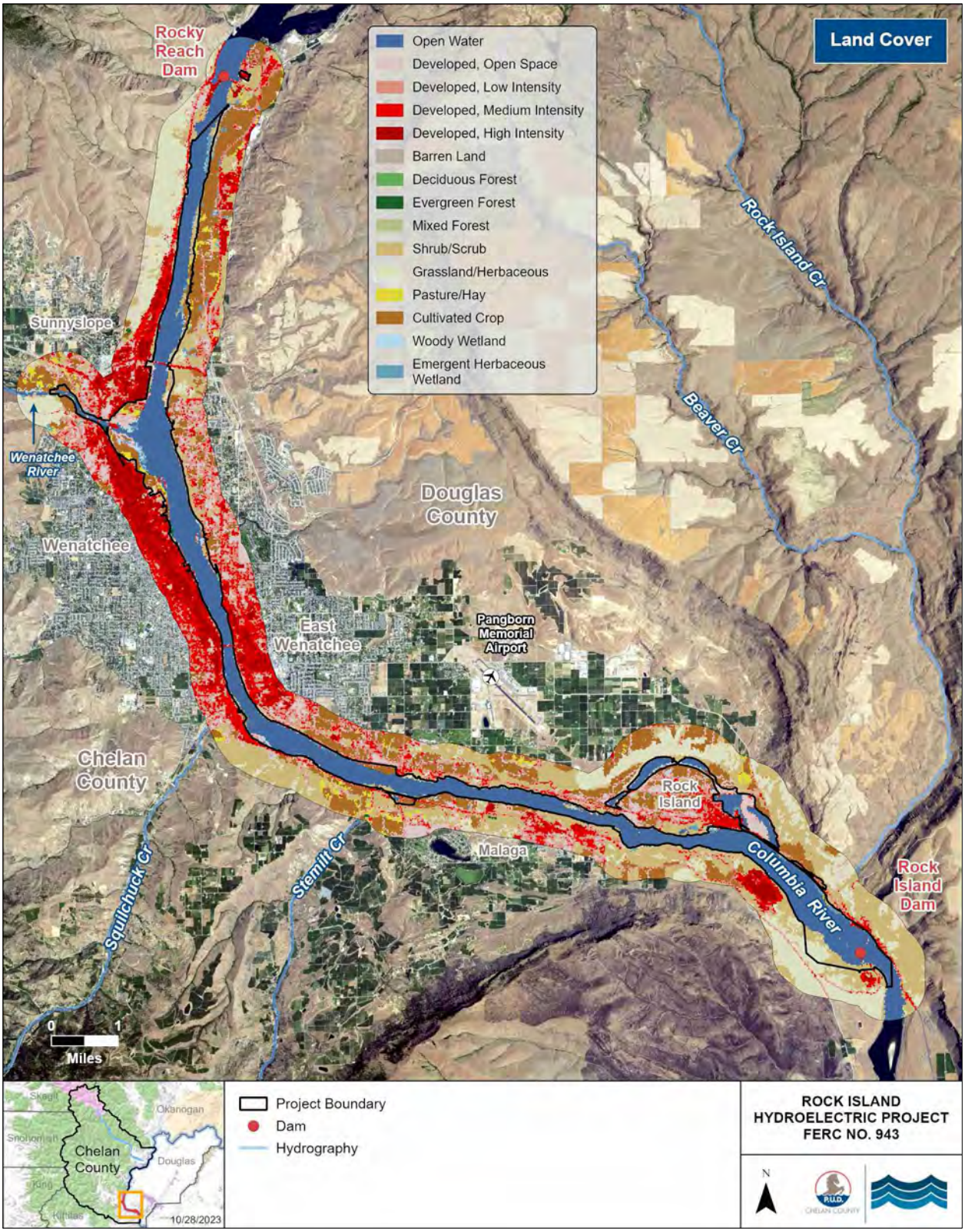

Figure 5.7-2 Land Cover in the Rock Island Project within the Rock Island Project Area

5.7.1.2 Shoreline Management

Passed by the legislature in 1971, the Washington State Shoreline Management Act (SMA) aims "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines" and regulates lands within 200 ft of the shoreline (Douglas County 2009). Both Chelan and Douglas counties maintain their own Shoreline Master Program (SMP) as do the cities of Wenatchee and East Wenatchee for shoreline developments within city limits.

All municipalities, counties, and towns near or in the Rock Island Project area recently developed management plans that may be relevant to Chelan PUD's SMM. These programs address shoreline development within a 200-foot buffer zone upland of the OHWM on non-federal lands. Chelan PUD implements its SMM in a manner that complements and is consistent with these plans. Refer to Section 5.1.4.1 for Chelan PUD's SMM programs/implementation of shoreline management practices.

The Chelan County SMP strives to assure an appropriate pattern of sound development in suitable locations without diminishing the quality of the environment along shorelines. It considers irrigated agriculture as a water-related use, with other shoreline uses not jeopardizing production on designated agriculture lands (Chelan County 2019). In addition to these two goals, the city of Wenatchee's SMP also encourages positive redevelopment that enhances the waterfront. The Chelan County SMP does not include shorelines within Wenatchee city limits which are covered in the city of Wenatchee SMP (City of Wenatchee 2014).

The Douglas County Regional Shoreline Master Program (Douglas County 2009) was developed in coordination with the cities of East Wenatchee and Rock Island and was adopted by the city of East Wenatchee becoming effective on August 27, 2009, and most recently amended on January 28, 2022. The Douglas County SMP aims to consider the use and development of shorelines and adjacent land areas for housing, business, industry, transportation, agriculture, forestry, natural resources, recreation, education, public buildings and grounds, utilities, and other categories of public and private land uses in relation to the natural environment while ensuring no net loss of ecological function (Douglas County 2009). East Wenatchee's SMP became effective on January 28, 2010, and was most recently amended on February 10, 2023 (City of East Wenatchee 2023).

5.7.2 Land Use and Management at the Rock Island Project

5.7.2.1 Project Lands

The Rock Island Project Boundary encompasses approximately 4,944 acres of lands, including approximately 10 acres of federal lands managed by the BLM.[78] These BLM lands are predominantly located downstream of Rock Island Dam (8.78 acres), though a small portion of BLM land (1.05 acres) is also located upstream of the dam. The remainder of Rock Island Project lands are owned by either Chelan PUD (approximately 1,226.6 acres) or are in state, county, municipal, or private ownership for which Chelan PUD has the necessary rights to operate the Rock Island Project. Most Rock Island Project lands are comprised of the Reservoir (approximately 3,120 acres of surface area at a normal maximum reservoir elevation of 613.0 ft NGVD 29). The remaining approximately 1,824 acres of Rock Island Project lands above the normal maximum reservoir level are primarily composed of Rock Island Project facilities such as Rock Island Dam, two powerhouses, transmission towers and lines (partial), maintenance facilities, offices, fishways, the Eastbank Hatchery (located just upstream of Rocky Reach Dam); flowage easements; and five developed recreation sites, as discussed in Section 5.6.[79] For more information about Rock Island Project lands, please see Section 3.0.

5.7.2.2 Rock Island Shoreline Management Manual

Pursuant to Articles 5 and 412 of the Rock Island Project license, Chelan PUD is directed to obtain sufficient ownership interest in Project lands, and to authorize certain non-Project uses by first obtaining FERC approval. In addition, the following management plans and agreements have been incorporated into the license and are considered in management of use and occupancy of Rock Island Project lands to protect and enhance the scenic, recreational, and environmental values of the Project: Wildlife Management Plan (Article 403), Bald Eagle Protection Plan (Article 404), Wildlife Mitigation Plan (Article 406 and 407), Endangered Species Plan (Article 408), Cultural Resources Management Plan (Article 409), Recreation Plan (Exhibit R), Anadromous Fish Agreement and Habitat Conservation Plan (Article 413), and the BTMP (Articles 414 and 415).

In addition to these license requirements, Chelan PUD developed a SMM in 2013, revised it in 2019 and again in 2023. Chelan PUD's Rock Island SMM was not incorporated into the current Rock Island Project license, but was developed in consultation with local, state, and federal

[78] FERC Accession Number 20090511-3059.
[79] The Home Water Wildlife Preserve – a 960-acre tract of mitigation lands associated with the Wildlife Management Plan that has been preserved for wildlife for the duration of the license. The Preserve is located off-site and not included in the Rock Island Project Boundary; therefore, not considered "Project Lands."

agencies to provide a mechanism for managing the multiple resources and uses of lands and shorelines within the Rock Island Project Boundary in a manner consistent with license requirements, while also anticipating future land and water uses (Chelan PUD 2023).

5.7.2.3 Best Management Practices

Chelan PUD is dedicated to employing BMPs when managing its properties, both within and outside the Rock Island Project Boundary. In some cases, specific BMPs may be a requirement of permits issued by Chelan PUD or other jurisdictional agencies and those BMPs shall be mandatory. Within the Rock Island Project Boundary, BMPs are required when implementing any land management measures on all Chelan PUD-owned lands and generally within the resource management areas. Chelan PUD does not mandate the use of BMPs on lands not owned by Chelan PUD (Chelan PUD 2023).

BMPs that support natural vegetation preservation or establishment along the shoreline include practices that (Chelan PUD 2023):

- Minimize clearing of native trees and vegetation;
- Minimize the removal of large trees along shorelines or other steep and erodible areas; and
- Provide temporary soil protection in disturbed areas through planting low maintenance, native grasses or other groundcovers recommended for site-specific conditions.

5.7.2.4 Shoreline Buffer Zones/Vegetation Management

BMPs that promote naturally vegetated shorelines are an integral part of efforts to maintain and improve water quality, shoreline stabilization, aesthetics, and wildlife habitat within the Rock Island Project Boundary. Removal of trees or other vegetation within 200 ft of the OHWM may be subject to local, state, and federal regulatory approval. Activities involving clearing, removing, or mowing vegetation, or planning to plant or landscape with vegetation or other materials, requires consultation with local governmental permitting staff. If the proposed activity occurs within the Rock Island Project Boundary, consultation with Chelan PUD staff may be necessary, as such actions may interfere with Project-specific resource management requirements (Chelan PUD 2023). Please refer to Section 5.1.4.1 for additional information on how the PUD manages the Rock Island Project's shorelines.

5.7.2.5 Erosion Control

Proposed erosion control measures are evaluated on a case-by-case basis depending on shoreline characteristics and classification during the permit review process. In general, bio-engineered

construction techniques and methods to minimize adverse effects to the riparian and nearshore aquatic environment are the preferred erosion control methodology. Chelan PUD's erosion control program at the Rock Island Project is described in detail in Section 5.1.5.

5.7.2.6 Non-Project Use Permitting Process

To begin the permitting process, Chelan PUD encourages applicants to contact their local city or county office for pre-application consultation, as well as other potential jurisdictional agencies to assess the feasibility of their proposed project before beginning the permitting process. To streamline the environmental permitting process, the state of Washington has a single application form that is mutually accepted by the jurisdictional agencies, called The Joint Aquatic Resource Permit Application (JARPA).[80] Applicants may also need to comply with SEPA or other local or state required authorizations for their project. If SEPA is required, it must be completed before local and state permits can be issued (Ecology 2022). Chelan PUD Real Estate Services staff are available to discuss project-specific considerations.

Chelan PUD will consider new non-Project use(s) if the proposed action has minimal effect on environmental/cultural resources, does not impede the Rock Island Project license and resource management plan requirements, or if other jurisdictional agencies approve mitigation plans to offset resource impacts as part of the regulatory approval process. Chelan PUD may require Rock Island Project-specific mitigation in some instances. Chelan PUD will not issue its permits/licenses unless applicants can provide proof of consultation, and where appropriate, receipt of permits from other jurisdictional agencies. Chelan PUD recommends that any proponent of a non-Project use contact Chelan PUD's Real Estate Services Department for pre-application consultation. This will help non-Project use proponents assess the feasibility of their proposals before entering the JARPA process (Chelan PUD 2023).

5.7.2.7 Shoreline Management Designations

To help differentiate between shoreline lands considered essential for Rock Island Project operations, necessary for environmental protection, and those likely appropriate for most private and commercial uses in its SMM, Chelan PUD has mapped lands within the Rock Island Project Boundary using three management designations: Integrated Use, Resource Management, and Project Operations. To protect resources, designations may change over time.

[80] The JARPA process is available online at www.epermitting.wa.gov/.

The Rock Island Project features approximately 58.0 miles of shoreline located either along the Columbia River (Rock Island Reservoir or below Rock Island Dam), Wenatchee River, or the "Rock Island Ponds" encircling the city of Rock Island. A public web map providing these shoreline designations is provided on Chelan PUD's website.[81] Descriptions of each management designation are provided in the following sections.

Integrated Use Area

Chelan PUD applies the integrated use designation (17.1 miles; 29.5 percent) to areas within the Rock Island Project Boundary with no known significant environmental resources, cultural resources, or associated resource management goals that would preclude Chelan PUD's approval of non-project uses as part of the JARPA process. While any development or use can incur unwanted or adverse effects on resources, these areas are those most appropriate for the widest range of private, non-residential, and commercial uses. The integrated use land management designation acknowledges existing uses, and anticipates future non-Project uses by including within this designation some currently undeveloped areas within the Rock Island Project Boundary that may be appropriate for future uses. Assignment of this designation to areas does not ensure that there are no protected or sensitive resources present, although the likelihood of them occurring is believed to be lower than in other designations. As such, Chelan PUD strongly encourages proponents of non-Project uses in this designation to consult with regulatory agencies and Chelan PUD Real Estate Services Department staff before moving forward with significant project planning (Chelan PUD 2023).

Resource Management Area

As described in the Chelan PUD SMM, Resource Management Areas have known significant environmental/cultural resources or associated resource management goals and subsequent resource management plans. They are created to monitor and protect environmental and cultural resources. Most of the Rock Island Project shoreline is classified as Resource Management Areas (31.2 miles; 53.9 percent). Protection of aquatic and terrestrial plant and animal species and their associated habitat(s), and the preservation of cultural areas are ongoing objectives of the Rock Island Project License and SMM. The primary objective for this designation is to protect environmental and cultural resources, including areas within the Rock Island Project Boundary identified in resource management plans as areas that merit special protection and/or ongoing monitoring. Typically, resource management areas require extensive environmental review,

[81] Chelan PUD, Maps: https://www.chelanpud.org/hydropower/licensing-and-compliance/land-management-plans/maps.

permitting, and mitigation, and may be prohibited pursuant to local, state, or federal law (Chelan PUD 2023).

Project Operations Area

Rock Island Project operations designation (9.6 miles; 16.5 percent) includes infrastructure that is essential to license-mandated operations of those facilities, structures, and sites required by the license, including Rock Island Dam, powerhouses, and appurtenant structures. Due to safety, security, operational, or other constraints, Chelan PUD must maintain strict control of these facilities and sites and may restrict public access to them. Chelan PUD also includes license-required developed recreational sites within this designation. For facilities associated with hydroelectric power production or for other appurtenant operations (e.g., fish production and rearing facilities), uses are strictly limited to those necessary for operation and maintenance. Chelan PUD has established site-specific regulations for recreational facilities, public information, and education sites (Chelan PUD 2023).

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5.8 Aesthetic Resources

This section describes the aesthetic resources in the Rock Island Project area and surrounding region. As specified in 18 CFR § 5.6(d)(3)(ix), this section summarizes readily available information on aesthetic resources at the Rock Island Project.

5.8.1 Visual Character of Project Lands and Water

The Rock Island Project is situated along the Mid-Columbia River, east of the Cascade Mountains, in the Wenatchee Valley, near the geographic center of Washington state. However, because the Rock Island Project is on the east side of the Cascade Mountains, it is considered to be within eastern Washington. Historic lava flows, glaciers and floods have shaped this area of rivers, valleys, rolling hills, gorges, rugged cliffs, deep canyons, and steep bluffs. The Wenatchee River flows into the Columbia River from the northwest near the Confluence State Park, just upstream of the Rock Island Project. The Wenatchee/Cascade Mountains are located south and west of the Rock Island Project area, forming a line of ridges and peaks. The Rock Island Project is situated largely between the cities of Wenatchee and East Wenatchee, and the remainder of lands surrounding the Rock Island Project are dominated by rangeland, shrubsteppe habitat, irrigated farmlands, and a mixture of private and federally owned lands.

West of the Columbia River, extending south from Rocky Reach Dam (upstream of the Rock Island Project), are precipitous bluffs, leaving only a narrow strip of land along the river that contains the railroad and State Route 97A. Near the confluence of the Wenatchee and Columbia rivers, the hills recede, providing broad, flat areas near the shorelines of both rivers that are currently used generally for orchards and recreation. The Wenatchee Confluence State Park spans both sides of the Wenatchee River at this confluence. South of the confluence, the urban areas of Wenatchee and East Wenatchee begin to dominate the landscape, featuring many parks and open spaces along the shoreline of the Columbia River. The cities of Malaga and Rock Island are downstream of Wenatchee and East Wenatchee, near the western and eastern shorelines of the Rock Island Project, respectively. These areas consist mostly of residential areas, although some recreation and open space may also be found along these shorelines. Below Malaga and Rock Island, the landscape once again transitions to rolling hills largely dominated by pasturelands, orchards, and open space, before reaching the site of the Rock Island Dam.

Most of the Rock Island Project facilities – dam, powerhouses, spillways, and fishways – are located at the site of the Rock Island Dam. Exceptions include: the Rock Island Project transmission lines, which run from each powerhouse to the northwest and generally alongside the Malaga-Alcoa Highway before reaching their McKenzie-Valhalla switchyard; and the five developed Rock Island Project recreation sites, which are mostly found along the shoreline in the developed areas of

Wenatchee and East Wenatchee. One of the developed Rock Island Project recreation sites, Kirby Billingsley Hydro Park, is located between East Wenatchee and Rock Island on the eastern shore of the Columbia River. Another site, Coyote Dunes, is also located on the east side of the Columbia River and extends south of State Route 2, just east of the Richard Odabashian Bridge.

Rock Island Project facilities are primarily concrete earth tone colors similar to the neighboring hills, valleys, gorges, canyons, and bluffs in the vicinity. The surrounding landscape contains muted shades of brown, green, gray, and beige in color. The surrounding hills and landscape are green in spring, turn brown/beige during the dryer summer months, and are snow-capped in winter. Photo 5-9 through Photo 5-25 below provide representative views of Rock Island Project features and surrounding landscapes.

Source: Kleinschmidt 2021

Photo 5-10 Rock Island Dam Looking Upstream

Source: Kleinschmidt 2021

Photo 5-11 Rock Island Forebay Behind Spillways, Looking Downstream

Source: Kleinschmidt 2021

Photo 5-12 Rock Island Open Spillways

Source: Kleinschmidt 2021

Photo 5-13 Rock Island Fish Ladder

Source: Kleinschmidt 2022

Photo 5-14 Columnar Basalt Islands Looking Downstream

Source: Kleinschmidt 2022

Photo 5-15 Aesthetic Overlook at Kirby Billingsley Hydro Park

Source: FlyingMAir 2019

Photo 5-16 Wenatchee Heights/Ridge Looking North at Wenatchee/Columbia Rivers

Source: FlyingMAir 2019

Photo 5-17 Wenatchee and East Wenatchee Looking Upstream; Car Bridge (foreground) then Pedestrian Bridge (background – part of Apple Capital Loop Trail)

Source: FlyingMAir 2019

Photo 5-18 Downtown Wenatchee and Wenatchee Riverfront Park to Picture Left Looking Upstream; East Wenatchee to Picture Right

Source: Kleinschmidt 2021

Photo 5-19 Sculpture at Wenatchee Riverfront Park

Source: Kleinschmidt 2021

Photo 5-20 Columbia River Looking Upstream from Wenatchee Riverfront Park

Source: FlyingMAir 2019

Photo 5-21 Walla Walla Point Park on Picture Left Looking Upstream; Apple Capital Loop Trail on Both Sides of River

Source: Kleinschmidt 2022

Photo 5-22 Walla Walla Point Park from Peninsula

Source: Chelan PUD 2016

Photo 5-23 Wenatchee River Confluence with the Columbia River, Looking Downstream

Source: Kleinschmidt 2022

Photo 5-24 Columbia River Looking Downstream from Coyote Dunes Natural Area

Source: FlyingMAir 2019

Photo 5-25 Odabashian Bridge (Formerly Olds Station Bridge) and Coyote Dunes Natural Area Where Apple Capital Loop Trail Crosses the Columbia River Looking Upstream

Source: FlyingMAir 2019

Photo 5-26 Upstream End of Rock Island Project Boundary; Rocky Reach Dam Looking Upstream

5.8.2 Nearby Scenic Attractions

There are numerous regional scenic attractions near the Rock Island Project, including state parks, national forests, wilderness areas and scenic byways, rivers, and trails. Section 5.6 describes relevant regional recreation areas in more detail.

5.8.2.1 National Wild and Scenic River System or State-Protected River Segment

No rivers are designated as part of the National Wild and Scenic River System in the Rock Island Project Boundary or surrounding area. There are no state-protected river segments near the Rock Island Project Boundary or surrounding area.

5.8.2.2 National Scenic Byways

The Cascade Loop National Scenic Byway (Cascade Loop) is a 440-mile scenic drive that received its federal designation as a National Scenic Byway in January 2021 (Cauvel 2021). The Cascade Loop encompasses several diverse regions from the Puget Sound to the Methow Valley, including the Wenatchee and Columbia River Valley areas near the Rock Island Project. The southern tip of the loop dips into Wenatchee, near the Rock Island Project. The Cascade Loop offers scenic views of lush forests, fertile orchards, jagged mountain peaks, sage-covered desert, historic mountain towns, and island communities (Scenic Washington 2017). The Cascade Loop traverses the Wenatchee River through Tumwater Canyon before reaching Leavenworth, Washington. Tumwater Canyon is approximately 9 miles long and 3,000 ft deep, offering spectacular views of snowmelt streams flowing into the Wenatchee River during the spring and brilliant autumn colors in the fall (Summit Post 2021; Cascade Loop 2021a). Stunning fall scenery continues from Jolanda Lake into Leavenworth, a charming town that is reminiscent of an alpine village (Cascade Loop 2021a). The Icicle Gorge Nature Loop of the Okanogan-Wenatchee National Forest, approximately 40 miles from the Rock Island Project, provides scenic views of Icicle Creek, Icicle Gorge, and surrounding conifer forests (WTA 2021a). The Cascade Loop continues into Wenatchee and the Columbia River Valley, providing scenic views of apple, pear, and cherry orchards and the confluence of Wenatchee and Columbia rivers (Cascade Loop 2021b), near the Rock Island Project. Located in Wenatchee, Ohme Gardens includes waterfalls, stone pathways, alpine flora, and scenic views overlooking the Columbia River, the cities of Wenatchee and East Wenatchee, the Wenatchee River and Columbia River confluence, as well as the Cascade Mountains (Ohme Gardens 2021; WTA 2021b).

Located on the Cascade Loop, Stevens Pass Greenway is an 89-mile National Scenic Byway stretching from Monroe, Washington to just east of Wenatchee. The byway travels eastward through the Mt. Baker-Snoqualmie and Okanogan-Wenatchee National Forests descending into

the fruit orchards of the Wenatchee River Valley (FHWA 2021). The byway offers opportunities to view wildflowers, waterfalls (Bridal Veil Falls, Alpine Falls, Deception Falls, and Eagle Falls), mountain peaks, and old growth forests (Cascade Loop 2021c; Stevens Pass Greenway 2021).

5.8.3 References

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5.9 Cultural Resources

This section describes the cultural resources in the area surrounding the Rock Island Project as specified in 18 CFR § 5.6(d)(3)(x). It includes a summary and a discussion of previous efforts to identify cultural resources with an emphasis on those resources listed on the National Register of Historic Places (NRHP).

Cultural resources can be divided into three general categories: archaeological resources, historic built environment resources, and places of traditional religious and cultural importance to a Tribe or Native Hawaiian organization. These categories are not completely independent, and much overlap exists.

Archaeological Resource – An archaeological resource is a place that contains the material remains of past human activity which can be used to demonstrate or learn about past human behavior. A single artifact is an isolate, while more than one artifact is a site. These resources can be further divided by general age with precontact resources being those that reflect use by Indigenous people before contact with settlers and historic-period resources usually postdating white settlement beginning in the early 1800s. Multicomponent archaeological resources have artifacts that date to both the precontact and historic-period. Usually, these sites reflect use of a specific location at two widely different time periods.

Historic Built Environment Resource (HBE) – HBE resources, often called "above ground resources," are resources constructed by people. These resources are usually visible on the landscape and include infrastructure such as bridges or drainage canals or buildings.

Places of Traditional, Religious and Cultural Importance – These resources include locations of cultural, historical, or spiritual value to groups in the local community. These places may not be related to a specific date or time and may not have strong physical characteristics. This category is most associated with places important to Tribes often as Traditional Cultural Properties (TCPs) and Traditional Cultural Landscapes (TCLs). These places can be locations of past human occupation or activities, and traditional gathering places which may not have an archaeological signature. They include locations featured in traditional stories, landscape features and items from the natural world (plants, mammals, birds, reptiles, amphibians, and fish) that would be hunted, fished, or gathered for subsistence or use in other traditional activities.

5.9.1 Identification of Tribes

Chelan PUD recognizes that many Tribes historically visited or currently visit the Rock Island Project area.

Before Chelan PUD initiated the ILP for the relicensing of the Rock Island Project with the filing of this PAD, the Yakama Nation and the CTCR expressed interest in cultural resources. In response, Chelan PUD engaged with both Tribes and the Washington State Department of Archaeology & Historic Preservation (DAHP) to exchange information on these matters.

Chelan PUD also recognizes that other Tribes may be interested in participating in this relicensing process. In 2021, Chelan PUD utilized a contact list provided by FERC to send notice to several Tribes. Chelan PUD will continue to engage in regional outreach to notify Tribes of this relicensing process. Tribes that respond with a request to be engaged in the relicensing will be included in the relicensing notices and process.

5.9.1.1 Confederated Tribes and Bands of the Yakama Nation

The Yakama Nation is a federally recognized Tribe established by the Yakama Treaty in 1855 (12 Stat. 951). The 14 bands/tribes that comprise the Yakama Nation lived across central and southern Washington (Hunn 2003; Relander 1986; and Chalfant 1974a, 1974b).

5.9.1.2 Confederated Tribes of the Colville Reservation

The CTCR is a confederation of Tribes established by Executive Order in 1872. The 12 Tribes of the CTCR lived across central and northern Washington State (CTCR 2021; Ruby and Brown 1986).

5.9.2 Cultural Resource Background Research

For purposes of this PAD, the cultural resource background research encompasses the Rock Island Project Boundary and a buffer area of approximately 1 mile around the Rock Island Project Boundary. While Chelan PUD anticipates that this research area will be over-inclusive of the Area of Potential Effect (APE) that will be established by FERC in consultation with DAHP and interested Tribes, this larger research area provides important cultural context of the vicinity of the Rock Island Project, including not just the Rock Island Project itself, but also low and moderate elevation landforms immediately surrounding the Rock Island Project.

5.9.1.1 Previous Cultural Resources Surveys

Most cultural resource surveys in the vicinity of the Rock Island Project have focused on archaeology, though work on other types of resources has also occurred. The earliest were archaeological surveys, conducted in the 1950s to search for sites that could be salvaged before they would be inundated or destroyed by proposed hydroelectric projects upstream and downstream of Rock Island Dam (Banks and Czaplicki eds. 2014). The first cultural resource investigations in the vicinity of the Rock Island Project were conducted by the Washington State

Highway Commission prior to construction of the Richard Odabashian Bridge in 1970 (Rice 1970). The first survey of the Rock Island Pool shoreline was conducted by Chelan PUD in the early 1970s, prior to constructing the second powerhouse at the dam and raising the reservoir level (Cleveland and Rice 1974).

There are numerous locations important to Tribes and tribal members within the Rock Island Project area. Some locations are also associated with archaeological sites such as villages, camps, and resource gathering and processing areas. Most of the larger archaeological sites are located near the confluence of the Columbia and its tributaries. (Boreson and Galm 2005; Ray 1974). But the value of many places is also in their association with events or individuals important in Tribal history, or for their role in traditional stories.

Prominent archaeological investigations that have occurred within the vicinity of Rock Island Project include data recovery excavations at Little's Landing (45CH62), the Chelan Boat Ramp Site (45CH212), Avey's Orchard (45DO176), Stemilt Creek Village (45CH302), and sites 45CH309 and 45CH791 (Avey 1972; Boreson and Galm 2005; Davis et al. 2013; Galm and Masten 1985; Lothson et al. 1982; McCoy 1971; Stevens and Galm 1991). These investigations have provided most of the archaeological knowledge of precontact Holocene use in the vicinity of the Rock Island Project.

Cultural resource studies have been conducted for development of recreation facilities, transportation projects, utility projects, private development, and upgrades to the hydroelectric facilities. To comply with License requirements identified in the Cultural Resource Management Plan, Chelan PUD has been conducting archaeological survey and site condition monitoring[82] regularly since 2003 (Berger 2012; Cowan 2011; Cowan and Ozbun 2014,[83] 2016a, 2016b, 2019a, 2019b; Cowan et al. 2017; Kelly 2011; Schumacher 2007, 2010, 2014; Schumacher and Gill 2004).

In October 2023, a query of previous cultural resources investigations within the vicinity of the Rock Island Project was conducted using the Washington Information System for Architectural and Archaeological Records Data (WISAARD) tool on the DAHP website. This search found 284 documents (Table 5.9-1). Nearly 75 percent are principally archaeological inventory surveys. Documents related to construction monitoring, management, planning, and research (e.g., theses, journal articles), as well as excavation projects (including research, evaluative testing, and data

[82] Chelan PUD coordinates with DAHP and affected Tribes on cultural resources issues. A cultural forum meets at least twice a year to coordinate study efforts.
[83] Monitoring occurred during the 2014 Wanapum emergency drawdown, where unusually low reservoir levels allowed monitoring to occur on previously inundated shoreline.

recovery efforts), were also found. More than 80 percent of the documents found were written after 2000. Chelan PUD is not aware of any TCP studies in the vicinity of the Rock Island Project.

Table 5.9-1 Archaeological Surveys Conducted Near the Rock Island Project

TYPE OF CULTURAL RESOURCE PROJECTS	COUNT
Archaeology Inventory Survey	197
Construction Monitoring	21
Management, Research, Planning, Collections Assessment	20
Excavations (including evaluation, recovery, research)	20
Archaeological Site Condition Monitoring	14
Historic Built Environment Inventory Survey	7
Archaeological and HBE Inventory Survey	5
Total	284

5.9.3 Previously Identified Cultural Resources Surrounding the Rock Island Project

Cultural resource records held by DAHP were reviewed to identify cultural resources within a one-mile zone of the Rock Island Project. This review identified 12 historic properties listed on the NRHP (Table 5.9-2) and 159 archaeological resources within a one-mile zone of the Rock Island Project Boundary (Table 5.9-3). Resources listed on the NRHP include the Wenatchee Flats archaeological site (45CH209), HBE resources such as the bridge over the Columbia River (45CH581) (Photo 5-26), structures and historic districts (45DT220 and 45DT253) within Wenatchee and East Wenatchee (Table 5.9-2).

Source: Chelan PUD 2020 Photo by Hana Tate

Photo 5-27 South Wenatchee Bridge in Morning Fog

Table 5.9-2 NRHP-listed Cultural Resources Surrounding the Rock Island Project

SMITHSONIAN NUMBER	CULTURAL RESOURCE CATEGORY	NAME	CONSTRUCTION YEAR	LISTED YEAR
45CH00209	Archaeological Resource	Wenatchee Flats Site		1973
45CH00239	HBE	U.S. Post Office and Annex – Wenatchee	1918; 1938	1977
45CH00243	HBE	Wells, A.Z., House	1909	1973
45CH00250	HBE	Rock Island Railroad Bridge	1893	1975
45CH00295	HBE	Columbia River Bridge – 9th Street	1908	1982
45CH00297	HBE	Wenatchee Carnegie Library	1911	1982
45CH00580	HBE	Horan, Michael, House (Demolished in 2019)	1899	1992
45CH00581	HBE	Columbia River Bridge – Stevens Street	1950	1995
45CH00649	HBE	Wenatchee Fire Station #1	1929	2004
45CH01065	HBE	Burke-Hill Apartments	1930	2021
45DT00220	HBE	Downtown Wenatchee Historic District		2008
45DT00253	HBE	Brown's First Addition Historic District	1926	2021

Archaeological resources within the vicinity of the Rock Island Project include precontact, historic-period, and multicomponent resources (Table 5.9-3). Most are sites, but isolates are also known. Precontact resources include camps, activity areas, burial locations, shell middens, rock features, talus pits, petroglyph and pictographs, fishing stations, and villages. Historic-period archaeological resources include homesteads, irrigation features, remnants of residential structures, agricultural features, and debris scatters.

Table 5.9-3 Archaeological Resources within the Area Surrounding the Rock Island Project

GENERAL AGE	TYPE		TOTAL
	SITE	ISOLATE	
Precontact	71	16	87
Historic	53	2	55
Multicomponent	17		17
Total	141	18	159

5.9.4 References

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5.10 Tribal Resources

As specified in 18 CFR, Section 5.6, (d)(3)(xii), this section addresses Tribal resources. The U.S. government and Tribes have a special trust relationship defined by treaties, executive orders, acts of Congress and judicial decisions. Tribes ceded land for promises of permanent homelands, recognition as distinct sovereign nations, and access to traditional resources from the federal government.

No Tribe or individual tribal member has reservation or trust lands within the Rock Island Project Boundary. With respect to the Rock Island Project Boundary, the Yakama Nation Reservation is located approximately 110 miles south, while the CTCR Reservation is located about 75 miles north. Both Tribes have traditional territories or ceded lands in the Rock Island Project area.

These Tribes and others may have other interests that may be affected by the Rock Island Project. Some of these interests, for example, archaeological resources, are defined and discussed elsewhere in this document.

Other tribal resources are not currently well known, as each Tribe is in the best position to define those resources and identify potential studies to ascertain potential impacts from the Rock Island Project. Chelan PUD anticipates working with the Tribes to identify tribal resources that may be impacted by Rock Island Project operations.

5.11 Socioeconomic Resources

This section describes existing socioeconomic conditions in the areas around the Rock Island Project, focusing primarily on both Chelan and Douglas counties. The socioeconomic characteristics of the communities near the Rock Island Project are influenced by land use patterns, population distributions, and current levels and trends of both employment and income within the economies of Chelan and Douglas counties. As specified in 18 CFR § 5.6(d)(3)(xi), this section summarizes readily available information on socioeconomic conditions potentially affected by the Rock Island Project.

5.11.1 Geographic Boundaries and Characteristics

The Rock Island Dam spans the Columbia River between Chelan and Douglas counties in northcentral Washington state (Figure 5.11-1). Nearby cities in the Rock Island Project area include Wenatchee and the unincorporated community of Malaga in Chelan County, as well as East Wenatchee and Rock Island in Douglas County.

Chelan and Douglas counties are primarily rural, with significant undeveloped areas owned by the USFS, BLM, and the state of Washington (NMFS 2002). Agriculture plays a pivotal in both counties, and the region is well known for its production of apples, pears, and various other tree fruits (Photo 5-28; Chelan PUD 1999). Most of the urbanized areas in both counties are concentrated within the narrow valley floors of the Columbia, Wenatchee, and Entiat rivers, as well as around Lake Chelan (Figure 5.11-1). The land uses in the vicinity of the Rock Island Project include recreational areas, conservation zones, rangeland, and private residences (NMFS 2002) (Figure 5.7-1). For additional information on land use in the Rock Island Project area, refer to Section 5.7 of this PAD.

Source: SweeTango Stemilt 2010

Photo 5-28 Apples in an Orchard near Wenatchee, WA

5.11.2 Population

Figure 5.11-1 shows the population across Douglas and Chelan counties. In 2020, the population of Chelan County was approximately 79,074 (U.S. Census Bureau 2020a), with the highest population in areas around Wenatchee (Figure 5.11-1). Wenatchee experienced its most

significant population growth between 2000 and 2020, with an increase of approximately 7,200 residents (City of Wenatchee 2023).

The population of Douglas County in 2020 was approximately 42,938 (U.S. Census Bureau 2020b). The city of East Wenatchee has the largest population in Douglas County, with a population of 14,158 people in 2020 (U.S. Census Bureau 2020c). Notably, East Wenatchee has seen a consistent upward trend in population growth over the last 3 decades. In 1990, the East Wenatchee Urban Area accounted for 63.5 percent of the Douglas County population, while by 2010, it represented 68.2 percent of the county's population (City of East Wenatchee 2019). Photo 5-29 depicts Wenatchee looking towards East Wenatchee and the Columbia River.

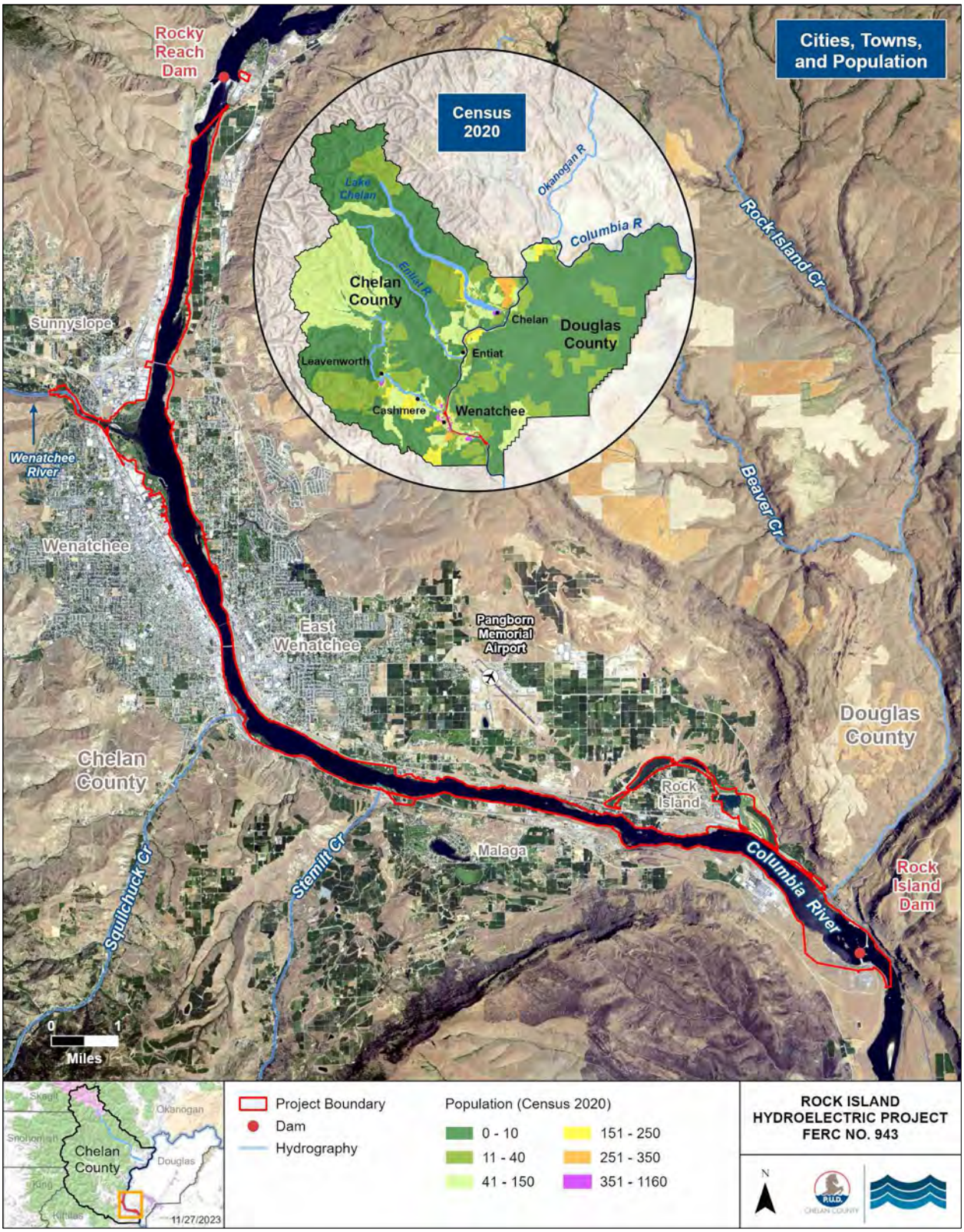

Figure 5.11-1 Population of Douglas and Chelan Counties

Source: Chelan PUD 2020

Photo 5-29 Wenatchee, Washington with a View of Wenatchee Towards the Columbia River

According to the 2020 decennial census, the total population of Washington was recorded at 7,705,281 (U.S. Census Bureau 2020d). Over the last decade, the state population has shown steady growth, primarily driven by net migration (Washington State Office of Financial Management 2022). The majority of this population increase is concentrated in the state's five largest metropolitan counties: Clark, King, Pierce, Snohomish, and Spokane (Washington State Office of Financial Management 2023). Notably, between 2022 and 2023, Douglas County experienced a 2.5 percent growth, and Chelan County saw a 1.05 percent increase in population (Washington State Office of Financial Management 2023).

Table 5.11-1 provides a summary of the demographic characteristics of the state, counties, and nearby cities. According to the 2020 census conducted by the United States Census Bureau, approximately 63.8 percent Washington's population identified as non-Hispanic white (U.S. Census Bureau 2020d). In Chelan and Douglas counties, the figures were 65.9 percent (U.S. Census Bureau 2020a) and 59.3 percent (U.S. Census Bureau 2020b) for non-Hispanic white, respectively.

Table 5.11-1 Population for Washington State, Chelan and Douglas Counties, and Nearby Cities

	WASHINGTON STATE	CHELAN COUNTY	WENATCHEE CITY, CHELAN COUNTY	DOUGLAS COUNTY	EAST WENATCHEE, DOUGLAS COUNTY
Population	7,705,281	79,074	35,508	43,938	14,158
White Alone (Percent)	77.5	93.0	70.4	92.0	65.5
Black or African American (Percent)	4.5	0.9	0.8	1.0	0.3
American Indian and Alaska Native (Percent)	2.0	2.1	0.6	2.4	0.7
Asian (Percent)	10.0	1.3	0.7	1.3	0.7
Native Hawaiian or Pacific Islander (Percent)	0.8	0.3	0.1	0.4	0.7
Two or More Races (Percent)	5.2	2.4	10.4	3.0	7.6
Hispanic (Percent)	13.7	28.7	32.5	33.4	31.6

Sources: U.S. Census Bureau 2020e, 2020f, 2020g, 2020h, and 2020i

While the majority of residents in both counties predominantly identify as non-Hispanic white, both Chelan and Douglas counties have substantial Hispanic populations, with approximately 30 percent of residents identifying as Hispanic (Table 5.11-1). The Wenatchee Valley Chamber of Commerce includes a Hispanic Business Council, which aims to advocate for and strengthen Latinx-owned businesses in the region (Wenatchee Valley Chamber of Commerce 2023). Additionally, the Wenatchee Valley Museum and Cultural Center hosts an annual community event, *Fiestas Mexicanas*, to celebrate Hispanic culture (Fiestas Mexicanas 2023).

In most Washington households, English is the dominant language spoken (80.0 percent), followed by Spanish (8.5 percent), and Asian and Pacific Island languages (6.1 percent) (U.S. Census Bureau 2020d). An estimated 26.1 percent of households in Chelan County (U.S. Census Bureau 2020a) and 29.2 percent of households in Douglas County (U.S. Census Bureau 2020b) speak a language other than English.

Table 5.11-2 provides a summary of the educational attainment levels of residents aged 25 and older in Chelan and Douglas counties. Statewide, 10.1 percent of the population has earned an associate's degree (U.S. Census Bureau 2020d). In Chelan and Douglas counties, the percentage of residents with an associate's degree are 10.1 and 9.5, respectively (U.S. Census Bureau 2020a and 2020b). Wenatchee Valley Community College is located in the city of Wenatchee and had a graduating class of 749 students for the 2020-2021 school year (Wenatchee Valley College 2021). Approximately 26.4 percent of Chelan County residents and 20.6 percent of Douglas County

residents hold a bachelor's degree or higher, including graduate or professional degrees (Table 5.11-2) (U.S. Census Bureau 2020a; 2020b).

Table 5.11-2 Education Attainment of Population 25 Years and Over

EDUCATION LEVEL	CHELAN COUNTY (PERCENT)	DOUGLAS COUNTY (PERCENT)	WASHINGTON STATE (PERCENT)
High School or Equivalent	25.5	29.2	21.8
Some College, No Degree	21.7	23.3	23.1
Associate's degree	10.1	9.5	10.1
Bachelor's Degree	16.6	13.8	22.8
Graduate or Professional Degree	9.8	6.9	13.9

Sources: U.S. Census Bureau 2020a, 2020b, and 2020d

5.11.3 Housing

The rate of homeownership in Douglas County exceeds the state average, whereas Chelan County has a lower homeownership rate, as indicated in Table 5.11-3. The median home prices in Washington state have demonstrated a consistent trend upward, reaching $415,500 during the first quarter of 2020 and $460,300 in the fourth quarter of 2020 (Chelan-Douglas Trends 2023). Specifically, in Chelan County, the median home price was $457,100, while in Douglas County, it was $382,200 in the fourth quarter of 2020 (Table 5.11-3) (Chelan-Douglas Trends 2023).

Table 5.11-3 provides housing statistics for 2020 for Washington state, Chelan and Douglas counties. Home listing prices in both Chelan and Douglas counties steadily increased from January 2020 to the second quarter of 2022 before experiencing a decline that lasted approximately 1 year (Chelan-Douglas Trends 2023). However, since the first quarter of 2023, median home prices have once again started to rise in both Chelan and Douglas counties (Chelan-Douglas Trends 2023). As illustrated in Figure 5.11-1, residential development tends to be concentrated in a few urban areas, with unincorporated smaller communities scattered throughout both counties.

Table 5.11-3 2020 State and County Housing Statistics

AREA	TOTAL HOUSEHOLDS	HOUSING UNITS	HOME OWNERSHIP (PERCENT)	MEDIAN HOME PRICES (U.S. DOLLARS)	MEDIAN GROSS MONTHLY RENT (U.S. DOLLARS)
Chelan County	30,296	37,267	60.5	457,100	1,071
Douglas County	15,415	17,318	67.8	382,200	1,077
Washington	2,974,692	3,202,241	64.0	460,300	1,484

Sources: Chelan-Douglas Trends 2023; U.S. Census Bureau 2020a; 2020b, and 2020d

5.11.4 Economy and Industries

The Wenatchee Metropolitan Statistical Area (MSA), encompassing the urban areas around Wenatchee in Chelan County and East Wenatchee in Douglas County, relies heavily on agriculture and seasonal employment in retail, leisure, and hospitality (Employment Security Department of Washington State 2022a). Agriculture serves as the dominant economic driver for both counties, providing jobs for approximately 11,398 people with an annual payroll exceeding $359 million (Table 5.11-4) (Employment Security Department of Washington State 2022a). The agricultural sector has direct connections to non-farm employment through nondurable goods manufacturing, wholesale trade, and transportation, with wineries playing an increasing important role in both agriculture and tourism (Employment Security Department of Washington State 2022a).

In 2020, non-farm employment within the Wenatchee MSA averaged 43,400 jobs (Table 5.11-4) (Employment Security Department of Washington State 2022a). Industries related to tourism, such as food service and accommodations, contribute significantly to the local labor market, particularly in two highly popular areas of Chelan County: Lake Chelan and Leavenworth. Moreover, East Wenatchee features a regional retail hub with the largest shopping mall in northcentral Washington. Retail trade accounts for 8.9 percent of jobs in Chelan County and 15.5 percent of jobs in Douglas County (Table 5.11-4). Accommodations and food services represented 10.2 percent and 7.1 percent of employment in Chelan and Douglas counties, respectively (Table 5.11-4). Photo 5-30 displays the Pybus Market in Wenatchee.

Table 5.11-4 Top Five Economic Sectors in Chelan and Douglas Counties in 2021

Industry Sector	Chelan County			Douglas County		
	Number of Jobs	Share of Employment (Percent)	Average Annual Wage (U.S. Dollars)	Number of Jobs	Share of Employment (Percent)	Average Annual Wage (U.S. Dollars)
Agriculture, Forestry, and Fishing	8,708	21.3	33,499	2,690	22.7	32,190
Health Services	6,478	15.8	69,399	839	7.1	38,981
Government	4,963	12.1	68,072	1,806	15.2	67,827
Accommodation and Food Services	3,623	10.2	26,763	843	7.1	25,142
Retail Trade	4,337	8.9	35,213	1,837	15.5	39,235
All Other Industries	12,917	31.6	35,541	3,860	32.5	33,136

Sources: Employment Security Department of Washington State 2022a and 2022b

In 2021, the Wenatchee MSA labor market saw the most significant job growth in the leisure and hospitality sector, accounting for 16.5 percent of jobs in Chelan County. This notable increase in leisure and hospitality can be attributed to the relaxation of COVID-19 pandemic restrictions (Employment Security Department of Washington State 2022a).

Source: Thomas 2016

Photo 5-30 Pybus Market in Wenatchee

As of 2020, Douglas County had a total of 790 employer establishments (U.S. Census Bureau 2020h), while Chelan County had 2,635 total employer establishments (U.S. Census Bureau 2020f). Chelan PUD employed between 700 and 850 people.

Between 2006 and 2019, the MSA's unemployment rates fluctuated, reaching 9.2 percent during the 2008 recession, and decreasing to 4.9 percent in 2018 (Employment Security Department of Washington State 2022a). However, the global COVID-19 pandemic had a significant impact, leading to a sharp rise in unemployment rates in Washington, as in much of the United States, during the spring of 2020, with rates exceeding 16 percent. Since then, employment has gradually rebounded, reaching 3.6 percent in September 2023 after the relaxation of COVID-19 pandemic restrictions (Employment Security Department of Washington State 2023).

5.11.5 Income

The state's median household income is $77,006 (U.S. Census Bureau 2020d); however, Chelan and Douglas counties have lower median household incomes, with $61,304 and $65,730, respectively (U.S. Census Bureau 2020a and 2020b). Table 5.11-5 provides a summary of household income distribution in the state and counties. Approximately 10.2 percent of the state's population lives below the poverty line (U.S. Census Bureau 2020d), compared to 11.0 percent in Chelan County and 11.6 percent in Douglas County (U.S. Census Bureau 2020a and 2020b). In 2020, the federal poverty line was $12,760 for a single person and $26,200 for a four-person household (U.S. IRS 2020).

The highest-paying industries in Chelan County in 2020 included securities, commodity contracts, and investments (with an average annual wage $143,670); ambulatory health care services ($106,960); other information services ($92,971); electronic markets and agents and brokers ($92,223); and construction ($84,099) (Employment Security Department of Washington State 2022a).

In Douglas County, the top-paying industries were the federal government (with an average annual wage $99,987); electronic markets and agents and brokers ($90,329); construction ($86,434); and merchant wholesalers of durable goods ($79,276) (Employment Security Department of Washington State 2022b). Employment rate and wage statistics for the utilities industry were not publicly available (Employment Security Department of Washington State 2022b). While agriculture, accommodations and food service, and retail trade industries employ a significant number of people in Chelan and Douglas counties, they tend to offer lower wages (Employment Security Department of Washington State 2022a).

Table 5.11-5 Household Income in 2020 Inflation Adjusted Dollars

INCOME RANGE (U.S. DOLLARS)	CHELAN COUNTY HOUSEHOLDS (PERCENT)	DOUGLAS COUNTY HOUSEHOLDS (PERCENT)	WASHINGTON STATE HOUSEHOLDS (PERCENT)
Less than 10,000	4.0	3.6	4.4
10,000 to 14,999	3.0	3.0	3.1
15,000 to 24,999	10.5	5.8	6.5
25,000 to 34,999	8.7	9.3	6.9
35,000 to 49,999	14.8	13.7	10.8
50,000 to 74,999	18.7	22.1	17.1
75,000 to 99,999	12.6	14.9	13.6
100,000 to 149,999	16.3	14.6	18.2
150,000 to 199,999	6.7	7.1	8.9
200,000 or more	4.7	6.1	10.5

Sources: U.S. Census Bureau 2020j, 2020k and 2020l

5.11.6 References

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5.12 Environmental Justice

The first Executive Order on environmental justice (EJ) was issued by President Clinton in 1994.[85] More recently, President Biden issued additional Executive Orders providing more specific details regarding how EJ will be addressed in the administration of policies and programs at the federal level.[86]

Although FERC as an independent agency technically is not required to comply with these Executive Orders, the Commission has reiterated the importance of addressing EJ in the licensing process. FERC has endorsed the use of USEPA's guidance regarding EJ assessments in the NEPA context.[87]

The White House Council on Environmental Quality has also proposed regulations that, for the first time, would explicitly incorporate EJ as part of the NEPA review process.[88]

5.12.1 Identification of Environmental Justice Communities[89]

EJ is focused on ensuring the meaningful involvement of all people and preventing disproportionate and adverse environmental and health impacts on vulnerable and overburdened communities. These communities are found in locations that have a significant proportion of people who have low incomes or a significant proportion of people of color.[90] To begin the EJ evaluation, identification of EJ communities surrounding the Rock Island Project must occur. Consistent with FERC recommendations in recent relicensing efforts, the methods outlined in USEPA's 'Promising Practices for EJ Methodologies in NEPA Reviews' were applied to identify EJ communities near the Rock Island Project.

The thresholds used for identifying EJ communities are as follows:

[85] Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 16, 1994). Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.
[86] Exec. Order No. 13985, 88 Fed. Reg. 7009 (Jan. 20, 2021). Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.; Exec. Order No. 14008, 86 Fed. Reg. 7619 (Jan. 27, 2021) Tackling the Climate Change Crisis at Home and Abroad; Exec. Order No. 14096, 88 Fed. Reg. 25251 (Apr. 26, 2023). Revitalizing Our Nation's Commitment to Environmental Justice for All.
[87] USEPA, Promising Practices for EJ Methodologies in NEPA Reviews, March 2016.
[88] National Environmental Policy Act Implementing Regulations Revisions Phase 2 Notice of Proposed Rulemaking, 88 Fed. Reg. 49924 (July 31, 2023).
[89] Tribes are discussed in Section 5.10 and are considered when determining whether an EJ community is present in or around the Rock Island Project Boundary area.
[90] Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 16, 1994). Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.; Exec. Order No. 14096, 88 Fed. Reg. 25251 (April 26, 2023). Revitalizing Our Nation's Commitment to Environmental Justice For All.

- The "meaningfully greater analysis" and the "50 percent" methods were used to determine EJ status based on race:
    - To meet EJ criteria using the "meaningfully greater analysis," a block group[91] qualifies as having EJ communities if the total minority population for a block group is at least 10 percent greater than that of the county population:

      (County minority population) x (1.10) = threshold above which a block group minority population must be for inclusion as an EJ community.
    - To meet EJ criteria using the "50 percent" method, the total minority population must be greater than 50 percent to qualify as an EJ community.
- The "low-income threshold criteria" was used to identify EJ communities based on income level, where the block group must have a higher percentage of low-income households than the county.

Since there are no new construction plans proposed for the Rock Island Project, a 1-mile zone was defined around the Rock Island Project Boundary as the geographic scope of analysis. Within this 1-mile zone around the Rock Island Project Boundary, there are 51 census block groups that could potentially be impacted by the relicensing. Of these, 22 census block groups are located in Douglas County, and the remaining 29 are in Chelan County. Among the 51 census block groups, there are 40 EJ communities, including 12 block groups with minority-only EJ populations, 12 block groups meeting only the low-income criteria, and eight block groups meeting criteria for both minority and low-income communities (Table 5.12-1).

Out of the 51 block groups within the 1-mile zone around the Rock Island Project, 21 directly border the Rock Island Project Boundary. Among these bordering block groups, five have minority-only EJ communities, four have low-income-only EJ communities, and four include both minority and low-income EJ communities (Figure 5.12-1 and Figure 5.12-2).

The final information analyzed for EJ includes individuals who are unable to speak English, regardless of whether they are part of a block group that includes EJ communities. Within Washington, 1 percent of the population aged 5 and older is unable to speak English (Table 5.12-1). Within Chelan County, 2 percent of the population aged 5 and older are unable to speak English, while Douglas County includes a 4 percent population of non-English speaking individuals aged 5 years and older (Table 5.12-1). Within the area surrounding the Rock Island Project, there are 25 block groups that include non-English speaking individuals: 12 in Chelan County and 13 in Douglas County (Table 5.12-1). The highest percentage of non-English speaking individuals, 15 percent

[91] Generally defined to contain between 600 and 3,000 people, a block group is a statistical geographic subdivision of a larger census tract, and the smallest geographic area for which Census data is provided.

each, occurs in two block groups within Chelan County, followed by one block group at 12 percent non-English speakers in Douglas County, and one at 11 percent in Chelan County (Table 5.12-1). The remaining block groups with non-English speaking individuals have populations of 7 percent or less meeting this criterion (Table 5.12-1).

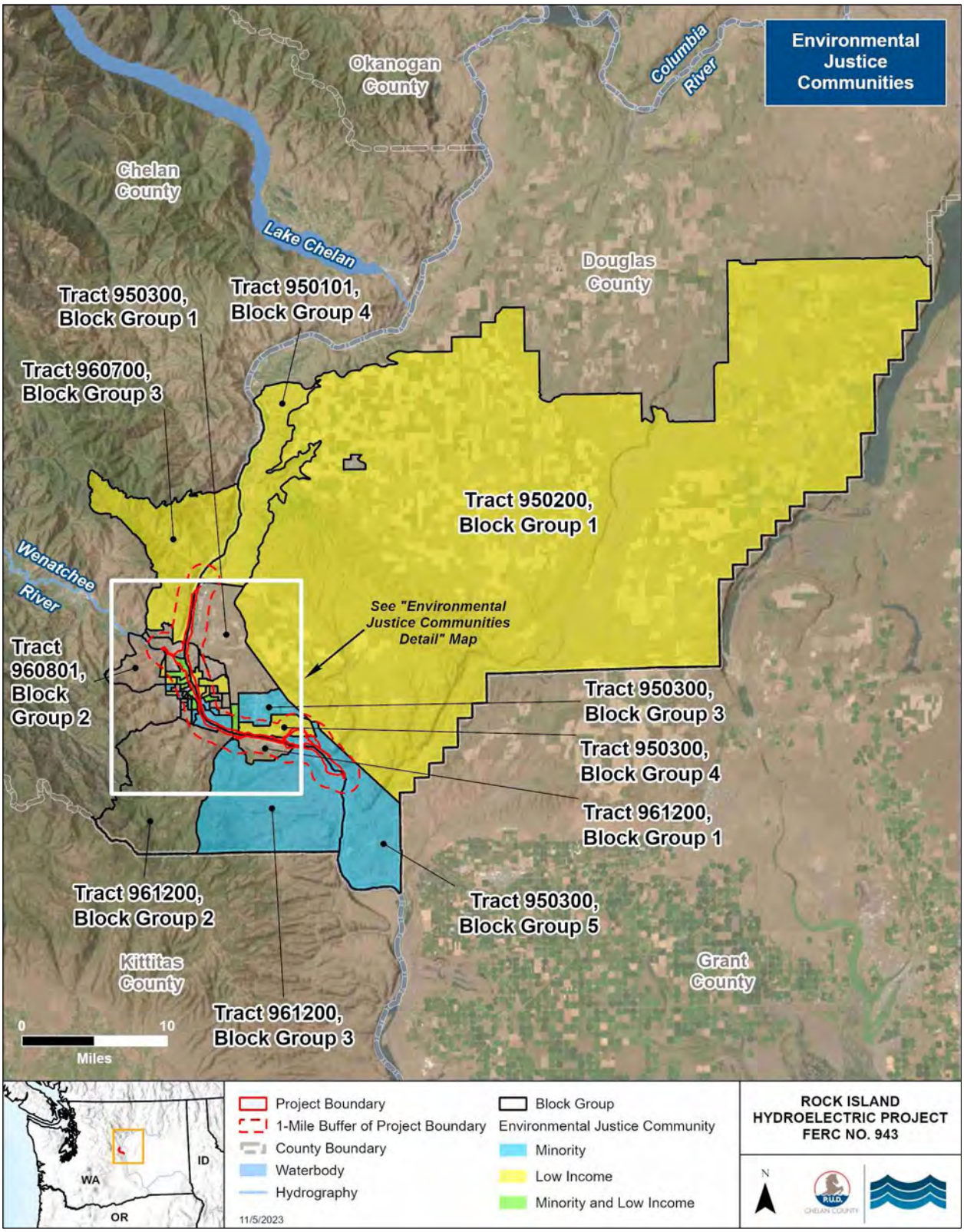

Figure 5.12-1 Environmental Justice Communities

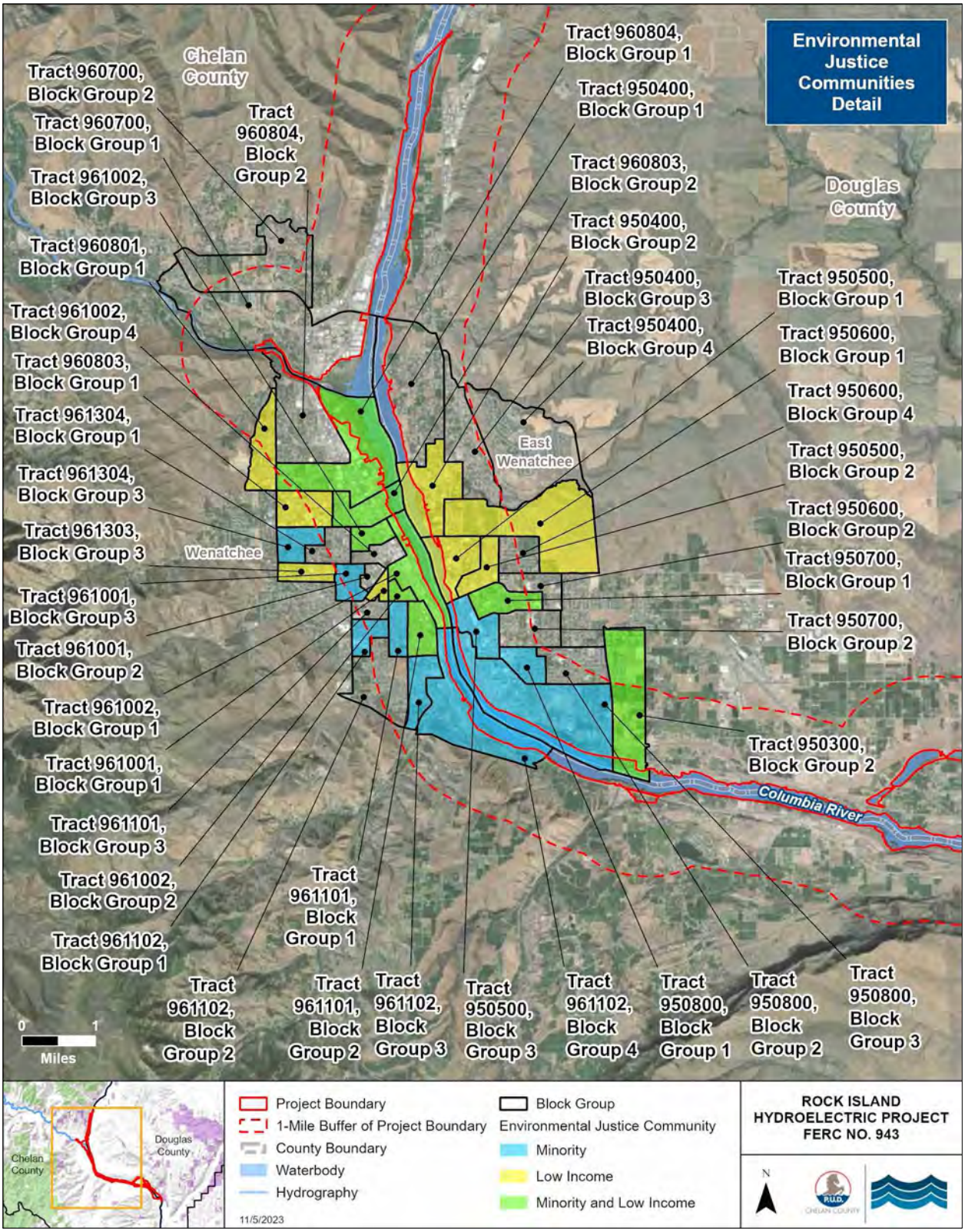

Figure 5.12-2 Environmental Justice Communities Detail

Table 5.12-1 Race, Ethnicity (Counts and Percentages), Income Data, and Language Data by Geographic Area

GEOGRAPHIC AREA	TOTAL POPULATION (COUNT)	WHITE ALONE, NOT HISPANIC (COUNT)	AFRICAN AMERICAN/ BLACK (COUNT)	NATIVE AMERICAN/ ALASKA NATIVE (COUNT)	ASIAN (COUNT)	NATIVE HAWAIIAN & OTHER PACIFIC ISLANDER (COUNT)	SOME OTHER RACE (COUNT)	TWO OR MORE RACES (COUNT)	HISPANIC OR LATINO (COUNT)	TOTAL MINORITY POPULATION (PERCENT)*	BELOW POVERTY DATA (PERCENT)*	NON-ENGLISH SPEAKING PERSONS AGED 5 YEARS AND GREATER (PERCENT)
Washington	7,512,465	5,067,909	279,720	75,677	656,578	49,219	23,363	388,477	971,522	33	10	1
Chelan County	76,653	51,761	247	330	624	32	90	2,038	21,531	32	10	2
Census Tract 961200, Block Group 2	1,865	1,385	0	24	0	0	0	0	456	26	9	4
Census Tract 960700, Block Group 1	1,368	1,098	0	0	0	0	0	0	270	20	0	0
Census Tract 961200, Block Group 1	1,504	1,242	0	0	0	0	22	15	225	17	5	1
Census Tract 960801, Block Group 1	817	639	0	0	4	0	0	19	155	22	16	0
Census Tract 961200, Block Group 3	1,189	615	0	10	0	0	0	0	564	48	8	0
Census Tract 961304, Block Group 3	1,533	882	0	8	47	0	0	163	433	42	0	0
Census Tract 960700, Block Group 3	1,313	1,012	0	0	0	0	0	56	245	23	10	0
Census Tract 961102, Block Group 3	2,777	259	0	0	0	0	0	0	2,518	91	9	5
Census Tract 960804, Block Group 2	2,328	1,567	4	1	2	0	0	55	699	33	9	0
Census Tract 960804, Block Group 1	1,646	931	0	0	0	0	0	102	613	43	19	2
Census Tract 960803, Block Group 2	2,153	1,255	0	49	79	0	0	202	568	42	12	2
Census Tract 960801, Block Group 2	2,028	1,692	0	0	60	0	47	153	76	17	5	0
Census Tract 961102, Block Group 2	1,878	1,471	36	27	0	0	0	53	291	22	2	0
Census Tract 960803, Block Group 1	1,730	1,296	0	0	0	0	0	0	434	25	10	3
Census Tract 961102, Block Group 4	564	193	0	0	0	0	0	0	371	66	7	15
Census Tract 961304, Block Group 1	917	889	0	0	0	0	0	8	20	3	5	0
Census Tract 961002, Block Group 1	492	305	26	0	0	0	0	14	147	38	24	5
Census Tract 961002, Block Group 3	1,137	451	0	0	0	0	0	53	633	60	32	0
Census Tract 961002, Block Group 4	1,062	925	75	0	0	0	0	36	26	13	2	0
Census Tract 961101, Block Group 2	1,741	142	0	0	0	0	0	0	1,599	92	35	15
Census Tract 960700, Block Group 2	1,241	1,124	0	0	0	0	0	12	105	9	5	0
Census Tract 961303, Block Group 3	1,242	907	18	0	0	0	0	0	317	27	14	0
Census Tract 961102, Block Group 1	1,273	594	35	0	0	0	0	0	644	53	0	4
Census Tract 961101, Block Group 1	2,164	952	0	2	0	0	0	52	1,158	56	7	4
Census Tract 961101, Block Group 3	378	307	0	27	0	0	0	44	0	19	6	0
Census Tract 961001, Block Group 2	861	602	12	21	0	0	0	29	197	30	6	0
Census Tract 961001, Block Group 3	1,381	833	0	0	33	0	0	7	508	40	9	0
Census Tract 961001, Block Group 1	607	506	0	0	0	0	0	0	101	17	14	11
Census Tract 961002, Block Group 2	489	236	0	0	11	0	0	0	242	52	11	0
Douglas County	42,520	26,874	187	348	258	138	43	1,070	13,602	37	10	4
Census Tract 950101, Block Group 4	659	440	6	0	0	13	0	3	197	33	13	1
Census Tract 950400, Block Group 2	1,759	1,109	0	31	14	27	0	10	568	37	16	7
Census Tract 950700, Block Group 1	1,462	618	0	43	0	0	0	35	766	58	34	1
Census Tract 950500, Block Group 1	1,448	870	0	0	0	0	0	97	481	40	17	1
Census Tract 950300, Block Group 5	1,332	636	6	0	0	0	0	21	669	52	9	4
Census Tract 950800, Block Group 2	2,034	1,364	66	0	77	0	0	8	519	33	4	0
Census Tract 950300, Block Group 1	1,600	1,177	0	0	0	0	0	58	365	26	5	0
Census Tract 950400, Block Group 4	2,101	1,877	0	67	18	0	0	139	0	11	6	0
Census Tract 950200, Block Group 1	1,469	1,252	0	21	0	0	0	51	145	15	12	2

GEOGRAPHIC AREA	TOTAL POPULATION (COUNT)	WHITE ALONE, NOT HISPANIC (COUNT)	AFRICAN AMERICAN/ BLACK (COUNT)	NATIVE AMERICAN/ ALASKA NATIVE (COUNT)	ASIAN (COUNT)	NATIVE HAWAIIAN & OTHER PACIFIC ISLANDER (COUNT)	SOME OTHER RACE (COUNT)	TWO OR MORE RACES (COUNT)	HISPANIC OR LATINO (COUNT)	TOTAL MINORITY POPULATION (PERCENT)*	BELOW POVERTY DATA (PERCENT)*	NON-ENGLISH SPEAKING PERSONS AGED 5 YEARS AND GREATER (PERCENT)
Census Tract 950300, Block Group 2	1,250	674	0	40	26	0	0	0	510	46	14	3
Census Tract 950300, Block Group 3	1,538	823	0	0	0	0	0	0	715	46	3	12
Census Tract 950300, Block Group 4	1,743	1,414	22	0	0	0	0	24	283	19	13	0
Census Tract 950400, Block Group 1	2,063	1,563	21	0	12	0	0	17	450	24	4	0
Census Tract 950400, Block Group 3	2,127	1,749	1	0	0	0	36	0	341	18	2	0
Census Tract 950500, Block Group 2	1,204	982	0	0	0	55	0	0	167	18	11	0
Census Tract 950500, Block Group 3	530	215	1	38	0	0	0	88	188	59	8	0
Census Tract 950600, Block Group 1	1,242	962	1	0	9	0	0	91	179	23	17	1
Census Tract 950600, Block Group 2	593	417	0	0	63	0	0	38	75	30	4	6
Census Tract 950600, Block Group 4	1,176	853	0	0	6	17	0	44	256	27	0	0
Census Tract 950700, Block Group 2	1,433	896	15	0	0	0	0	53	469	37	9	5
Census Tract 950800, Block Group 1	1,534	763	0	0	0	0	0	49	722	50	9	1
Census Tract 950800, Block Group 3	2,417	1,327	37	0	23	0	0	3	1,027	45	8	5

*EJ Communities are highlighted in grey.
Sources: U.S. Census 2020a, 2020b, 2020c

Chelan PUD is tailoring its outreach efforts related to the relicensing process to ensure inclusivity and opportunities for participation by EJ communities. Input from EJ communities will inform the development of the license application. Chelan PUD will also assess potential impacts and benefits associated with the Rock Island Project on EJ communities.

One such consideration will be the cost of the electricity generated by the Rock Island Project, and its availability to EJ communities in the vicinity of the Project. For example, Chelan County offers the second-lowest electric rates in the United States (Chelan PUD 2017). As a result, in comparison to the rest of the state, Chelan County has the lowest proportion of low-income residents who spend over 6 percent of their income on power bills (WSDOC 2023).

Additionally, Chelan PUD partners with the Community Action Council to offer energy assistance programs to EJ communities. These programs include weatherization measures, and rebates for energy-saving enhancements, including insulation, heat pumps and new windows. Chelan PUD also extends support to qualifying nonprofit low-income housing programs by waiving connection fees.

5.12.2 References

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United States Census Bureau (U.S. Census). 2020a. B16004 - Age by language spoken at home by ability to speak English for the population 5 years and over. Available online (2020 data was used): Census Bureau Table.

_____. 2020b. B03002 - Hispanic or Latino origin by race. Available online (2020 data was used): Census Bureau Table.

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Washington State Department of Commerce (WSDOC). 2023. Low-income energy assistance 2023 legislative report. Available online: https://app.leg.wa.gov/ReportsToTheLegislature/Home/GetPDF?fileName=CommerceReports_2023_Energy_Energy%20Assistance%20Report_Final_5001c308-6921-403b-b140-bd6e15d1a31a.pdf.

6.0 PRELIMINARY ISSUES, PROJECT EFFECTS, AND STUDIES LIST

FERC content requirements for this section are specified in 18 CFR §§ 5.6 (d)(3), 5.6(d)(4)(i), and 5.6(d)(4)(ii). Each resource area includes:

- Known and potential issues;
- PM&E measures currently in the license, or proposed;
- Studies conducted during early engagement;
- Studies proposed in the ILP; and
- Studies discussed with the TWG participants, but not proposed.

Potential resource issues and associated studies related to the Rock Island Project were identified through the following activities:

- Review and evaluation of relevant available information (see Section 5.0, Existing Environment); and
- Early engagement TWG meetings which included resource agencies, tribes, local governments, NGOs, and the public (Appendix B.1).

Technical Working Groups and Early Engagement Studies

During the 2 years of early engagement (see Section 2.0), Chelan PUD met and collaborated with TWGs to solicit potential resource concerns regarding the continued operation and maintenance of the Rock Island Project under a new FERC license term. The product of this collaboration resulted in resource specific issue statements that describe concerns which may have a nexus to ongoing Rock Island Project operation and management activities. For each issue statement, existing information, information gaps, and where appropriate, study requests were discussed.

In instances where Chelan PUD determined study requests met the early engagement study criteria, which were based on Chelan PUD's interpretation of the FERC Study criteria as described in the Technical Working Group Guidelines (Appendix B.4), study development moved forward. Following draft study plan development, TWG participants were provided the opportunity to review and comment on draft study plans prior to study implementation. Chelan PUD reviewed the TWG comments and incorporated feedback, as applicable, in the final study plans.

Likewise, draft study reports were provided to TWG participants following data collection. Chelan PUD reviewed draft study report comments and incorporated feedback, as applicable, into the final study reports.

For each comment received on draft study plans and reports, Chelan PUD provided a response describing how the comment was incorporated, or why it was not adopted. Comments provided by Chelan PUD are included as part of the consultation table included with each final study plan and report (Appendix G).

Not all TWG requested studies were determined to meet the early engagement study criteria by Chelan PUD; in these instances, study planning did not progress.

Details of the TWG early engagement process including agendas, meeting summaries, attendees, and presentations are provided in Appendices B.1, B.2 and B.3.

6.1 Geology and Soils

Geology and soils resources are described in Section 5.1.

6.1.1 Known and Potential Issues

The ongoing operation of the Rock Island Project is known to affect geology and soils by means of shoreline erosion.

6.1.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

There are no PM&Es specific to geology and soils resources in the current license. Ongoing measures to manage shoreline erosion are described in Section 5.1.4. Chelan PUD proposes the continued maintenance of its non-FERC required SMM as a PM&E measure related to shoreline erosion at the Rock Island Project.

6.1.3 Studies and Evaluations Conducted During Early Engagement

There were no studies or evaluations conducted during early engagement for the geology and soils resources area.

6.1.4 Integrated Licensing Process Proposed Studies

Chelan PUD will not be proposing any geology and soils resource studies.

6.1.5 Studies Discussed, Not Proposed

No studies were discussed during early engagement nor requested by the TWG participants.

6.2 Water Resources

Water resources are described in Section 5.2.

6.2.1 Known and Potential Issues

The Water Quality subteam of the Fish and Aquatic TWG identified the potential for Rock Island Project operations to impact water resources and developed the following water quality issue statement:

1. *Limited water quality data are available on the mainstem Columbia River within the Rock Island Project to support certification of Project operations' compliance with water quality standards.*

Chelan PUD conducted a baseline water quality study during early engagement to address this data gap (see Section 5.2.5 and 6.2.3).

6.2.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Based on the discussion in Section 5.2, Chelan PUD is not proposing any PM&E measure related to water resources at this early stage of the ILP. Ongoing actions and regulatory requirements for the protection of water quality are described throughout Section 5.2.

6.2.3 Studies and Evaluations Conducted During Early Engagement

The following water resources studies and evaluations were completed during early engagement (Table 6.2-1). Results of these studies are incorporated into Section 5.2 and are included as study plans and study reports in Appendix G.

Table 6.2-1 Water Resources Early Engagement Studies and Evaluations

STUDY/EVALUATION NAME AND ID	STUDY APPROACH
WQ Monitoring Study	Chelan PUD collected water quality data that support the certification of the Rock Island Project operations' compliance with water quality standards. Supplement existing information to evaluate potential water quality effects of operations. Results are incorporated in Section 5.2. See Four Peaks 2023 - Appendix G.1 for more details.
Bathymetry/LiDAR Survey and Pool Fluctuation Modeling	Chelan PUD conducted a comprehensive bathymetric survey and developed a 2-D hydraulic model based on the USACE Hydrologic Engineering Center River Analysis System (HEC-RAS) modeling framework. Rock Island pool metrics were updated, and new system stage-storage-discharge curves were developed. Results are incorporated in Section 5.2.2. The model was successfully field verified in 2023. See NHC 2023 - Appendix E.1 for more details.

6.2.4 Integrated Licensing Process Proposed Studies

Chelan PUD is not proposing any additional water resources studies.

6.2.5 Studies Discussed, Not Proposed

The Water Quality subteam of the Fish and Aquatic TWG discussed potential water temperature and TDG data needs in early engagement. Chelan PUD has concluded existing information is adequate (Sections 5.2.5.2 and 5.2.5.3) and that a further study is not warranted.

6.3 Fish and Aquatic Resources

Fish and aquatic resources are described in Section 5.3.

6.3.1 Known and Potential Issues

The ongoing operation of the Rock Island Project affects fish and aquatic resources. During early engagement, the Fish and Aquatic TWG participants identified the potential for Rock Island Project operations to impact Bull Trout, resident fish, Pacific Lamprey, White Sturgeon, and native mussels.

The following fish and aquatic issue statements were derived through early engagement with the Macrophyte, Pacific Lamprey, Bull Trout, and White Sturgeon subteams of the Fish and Aquatic TWG:

1. *Limited aquatic macrophyte data are available on the mainstem Columbia River within the Rock Island Project to support certification of Project operations' compliance with water quality standards.*
2. *Rock Island Project operations have the potential to affect adult Bull Trout migration timing, ladder passage and fall back, and downstream migration.*
3. *Rock Island Project operations have the potential to affect subadult Bull Trout dam passage and survival during their downstream or upstream migration.*
4. *Rock Island Project operations have the potential to affect subadult Bull Trout stranding within the Rock Island Reservoir.*
5. *Rock Island Project operations have the potential to affect juvenile Pacific Lamprey survival through turbine passage during downstream migration.*
6. *Rock Island Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration.*
7. *Rock Island Project operations have the potential to affect juvenile Pacific Lamprey exposure to predation (in the tailrace) during downstream migration.*
8. *Rock Island Project operations have the potential to affect larval/macrophthalmia survival (stranding/predation) in the Project reservoir.*
9. *Rock Island Project operations have the potential to affect resident fish stranding within the Rock Island Reservoir.*
10. *Rock Island Project operations have the potential to affect resident fish species through entrainment or direct mortality during downstream passage.*

11. *No White Sturgeon population age and size structure, genetic diversity, or abundance data are available to assess potential effects of population fragmentation.*

6.3.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Ongoing measures for the protection of fish and aquatic resources are fully described in Section 5.3.

In 2004, FERC amended the Rock Island license to incorporate the HCP's requirements for salmon and steelhead as well as conditions for Bull Trout that resulted from USFWS's Section 7 consultation on the license amendment. These PM&E measures continue to be implemented by Chelan PUD under the current license. Because the HCP is a 50-year agreement between Chelan PUD and federal, state, and Tribal parties, Chelan PUD's obligations under the HCP continue beyond the existing license term and Chelan PUD will continue implementing the HCP under a new license.

6.3.3 Studies and Evaluations Conducted During Early Engagement

The following fish and aquatic studies and evaluations were completed during early engagement (Table 6.3-1). Results of these studies are incorporated into Section 5.3 and are included as study plans and study reports in Appendix G.

Table 6.3-1 Fish and Aquatic Resources Early Engagement Studies and Evaluations

STUDY/EVALUATION NAME AND ID	STUDY APPROACH
Final Macrophyte Study Plan and Report	Chelan PUD located and mapped the presence of macrophyte beds throughout the Rock Island Reservoir and documented the dominant and subdominant macrophyte species, including invasive species, found in each bed. Results are incorporated into Sections 5.3.3 and 5.5.3. See EAS 2023 - Appendix G.2 for more details.
Final Adult Lamprey Infrastructure Assessment	Chelan PUD characterized and assessed physical infrastructure conditions within the three fishways at the Rock Island Project that have the potential to affect both upstream passage success and enumeration of adult Pacific Lamprey. Results are incorporated into Section 5.3.6.7. See Four Peaks 2023 - Appendix G.3 for more details.
Final White Sturgeon Population Index	Chelan PUD determined the status and characterized the population of White Sturgeon in the Rock Island Reservoir. Chelan PUD also provided information on population size and ability to achieve natural recruitment allowing for a self-sustaining population. Results are incorporated in Section 5.3.7.2. See Blue Leaf 2023 - Appendix G.4 for more details.

6.3.4 Integrated Licensing Process Proposed Studies

In addition to the fish and aquatic studies conducted in early engagement, Chelan PUD proposes to develop the relicensing studies listed in Table 6.3-2. These study plans will be included in the Proposed Study Plan (PSP) filing.

Table 6.3-2 Fish and Aquatic Resources Proposed Studies to be Developed During Relicensing

STUDY NAME AND ID	STUDY APPROACH
Larval Pacific Lamprey Varial Zone	Assess the risk of stranding or entrapment for larval Pacific Lamprey within suitable habitat in the varial zone of the reservoir (see Issue Statement 8 in Section 6.3.1). A draft Study Plan was developed in coordination with the Pacific Lamprey subteam of the Fish and Aquatics TWG and distributed to all Fish and Aquatics TWG members for input during early engagement. A Study Plan will be provided in the Proposed Study Plan (PSP).
Bull Trout/Resident Fish Stranding and Trapping	Assess the risk of stranding or entrapment for subadult Bull Trout and resident fish species in the reservoir (see Issue Statements 4 and 9 in Section 6.3.1). A draft Study Plan was developed in coordination with the Bull Trout/Resident Fish subteam of the Fish and Aquatics TWG and distributed to all Fish and Aquatics TWG members for input during early engagement. A Study Plan will be provided in the PSP.
Pacific Lamprey Adult Passage	Assess potential effects to adult Pacific Lamprey passage at Rock Island Dam during upstream migration (see Issue Statement 6 in Section 6.3.1). A Study Plan will be provided in the PSP.

6.3.5 Studies Discussed, Not Proposed

Other studies were discussed with the Bull Trout and Pacific Lamprey subteams of the Fish and Aquatic TWG. They were not conducted during early engagement and are not proposed to be conducted during the ILP. The reasons are listed in Table 6.3-3 below.

Table 6.3-3 Fish and Aquatic Resources Studies Discussed During Early Engagement, and Rationale to Not Study

STUDY DISCUSSED	RATIONALE
Project effects to Adult Bull Trout (see Issue Statement 2 in Section 6.3.1).	Existing information is sufficient and is summarized in Section 5.3.7.1 of this document.
Subadult Bull Trout Passage Survival (see Issue Statement 3 in Section 6.3.1).	Chelan PUD does not believe a study is appropriate given available sample size and methodology. Existing information is sufficient and is summarized in Section 5.3.7.1 of this document.
Juvenile Pacific Lamprey Passage (see Issue Statement 5 in Section 6.3.1).	Chelan PUD does not believe a study is appropriate given the lack of a proven implementable methodology. Existing methods to assess juvenile Pacific Lamprey predation have not produced results with a level of detail necessary to inform Project effects.

STUDY DISCUSSED	RATIONALE
Resident Fish Passage (see Issue Statement 10 in Section 6.3.1).	Chelan PUD does not believe a study is appropriate given the lack of a proven implementable methodology. Existing methodology would be infeasible to implement at the scale necessary to assess Project effects.

6.4 Upland Wildlife and Botanical Resources

Upland wildlife and botanical resources are described in Section 5.4.

6.4.1 Known and Potential Issues

The continued operation and maintenance of the Rock Island Project may potentially affect upland wildlife and botanical resources. The following issue statement was derived through early engagement with the RTE Plants subteam of the Wildlife and Botanical TWG:

12. *A comprehensive RTE plant survey is necessary to locate any current RTE plant species that may be affected by Rock Island Project operations, including Ute ladies'-tresses.*

6.4.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Ongoing measures for the protection of upland wildlife and botanical resources are described throughout Section 5.4.

Existing PM&E for wildlife and botanical resources include:

- Wildlife Habitat Management of the Home Water Wildlife Preserve.
- Monitoring the use of Wood Duck nest boxes installed at the Rock Island Project.

Of these, Chelan PUD proposes to continue the implementation of the Wildlife Habitat Management of the Home Water Wildlife Preserve.

6.4.3 Studies and Evaluations Conducted During Early Engagement

The following upland botanical and wildlife studies and evaluations were completed during early engagement (Table 6.4-1). Results of these evaluations and studies are incorporated into Section 5.4 and are included as study plans and study reports in Appendix I (Confidential).

Table 6.4-1 Upland Wildlife and Botanical Resources Early Engagement Studies and Evaluations

STUDY/EVALUATION NAME AND ID	STUDY/EVALUATION APPROACH
RTE Plant Surveys	Chelan PUD conducted surveys to locate any occurrences of terrestrial and riparian federal and state listed vascular plant, bryophyte, and lichen species occurring in the study area. Results are incorporated into Section 5.4.6. See Beck Botanical Services 2023 – Appendices G.5 and I.1 for more details.
Piscivorous Bird	Chelan PUD has conducted a variety of piscivorous bird monitoring and management activities that directly reduce predation on out-migrating salmon and steelhead smolts. Results are incorporated into Section 5.4.2.2. See Appendix E.4 for more details.
Black Cottonwood	Chelan PUD conducted field surveys documenting black cottonwood stands in the Rock Island Project Boundary. Black cottonwood stands cover a large area and are spatially distributed with a diversity of age classes. Results are incorporated into Section 5.4.6. See Appendix E.5 for more details.

6.4.4 Integrated Licensing Process Proposed Studies

Chelan PUD is not proposing any further upland wildlife or botanical resource studies.

6.4.5 Studies Discussed, Not Proposed

No additional studies were discussed during early engagement nor requested by the TWG participants.

6.5 Wetland, Riparian and Littoral Habitat

Wetland, riparian, and littoral habitat resources are described in Section 5.5.

6.5.1 Known and Potential Issues

The continued operation and maintenance of the Rock Island Project will affect wetland, riparian and littoral habitat. Additionally, the following issue statement was derived through early engagement with the Macrophyte subteam of the Fish and Aquatic TWG, and the RTE Plants subteam of the Wildlife and Botanical TWG:

1. *Limited aquatic macrophyte data are available on the mainstem Columbia River within the Rock Island Project to support certification of Project operations' compliance with water quality standards.*
2. *A comprehensive RTE plant survey is necessary to locate any current RTE plant species that may be affected by Project operations, including Ute ladies'-tresses.*

6.5.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Wetland, riparian, and littoral habitat are described throughout Section 5.5. Chelan PUD proposes the continued maintenance of its non-FERC required SMM as a PM&E measure related to wetland, riparian, and littoral habitat at the Rock Island Project.

6.5.3 Studies and Evaluations Conducted During Early Engagement

The following botanical studies and evaluations were completed during early engagement (Table 6.5-1). Results of these studies are incorporated into Section 5.3.3, 5.4.6.2, 5.5.2 and 5.5.3 and included as study plans and reports in Appendix G and Appendix I (Confidential).

Table 6.5-1 Wetland, Riparian and Littoral Habitat Early Engagement Studies and Evaluations

STUDY/EVALUATION NAME AND ID	STUDY APPROACH
Final Macrophyte Study Plan and Report	Chelan PUD located and mapped the presence of macrophyte beds throughout the Rock Island Reservoir and documented the dominant and subdominant macrophyte species, including invasive species, found in each bed. Results are incorporated into Sections 5.3.3 and 5.5.3. See EAS 2023 – Appendix G.2 for more details.
RTE Plants– Ute ladies'-tresses (ULT) Focused Surveys	Chelan PUD will conduct 3 years of ULT surveys in suitable habitat, as recommended in the USFWS 1992 Interim Survey Requirements for Ute Ladies'-tresses Orchid (USFWS 2017). Years 1 and 2 of the study are complete. Year 3 of the study will be conducted in 2024. Results are incorporated into Section 5.4.6.2 and 5.5.2. See Appendix I.2 (Confidential) for more details.

6.5.4 Integrated Licensing Process Proposed Studies

Chelan PUD is not proposing any further wetland, riparian, and littoral habitat resource studies.

6.5.5 Studies Discussed, Not Proposed

No additional studies were discussed during early engagement nor requested by the TWG participants.

6.6 Recreation Resources

Recreation resources, including existing measures, are described in Section 5.6.

6.6.1 Known and Potential Issues

During early engagement, Chelan PUD convened a Recreation TWG. Participants identified the potential for Rock Island Project operations to impact recreation resources near the Project. The following recreation resources issue statements were derived through early engagement with the Recreation TWG:

1. *Whether recreation use and capacity at facilities and amenities designated in Chelan County PUD's Recreation Plan for the Rock Island Project (i.e., Wenatchee Riverfront Park, Walla Walla Point Park, Kirby Billingsley Hydro Park, Wenatchee Confluence State Park, and Coyotes Dunes Natural Area) meet current and anticipated needs at those sites.*

2. *Whether designated natural areas in Chelan County PUDs Recreation Plan (i.e., Coyote Dunes Natural Area and Horan Natural Area within Wenatchee Confluence State Park) are managed to preserve their function as natural areas.*

3. *Whether education and interpretive opportunities at facilities designated in Chelan County PUD's Recreation Management Plan for the Rock Island Project meet current and expected future needs at those sites.*

4. *Whether reservoir levels affect recreation use, experience, and access at facilities and amenities designated in Chelan County PUD's Recreation Plan for the Rock Island Project.*

6.6.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

As part of the next Rock Island Project license, Chelan PUD proposes to continue implementation of the FERC-approved Recreation Management Plan.

6.6.3 Studies and Evaluations Conducted During Early Engagement

The Recreation Resources Inventory Study was completed during early engagement (Table 6.6-1). The study provided updated recreation site inventory information. The Recreation Resources Inventory study plan and report are included in Appendix G.6.

Table 6.6-1 Early Engagement Study and Evaluations

STUDY/EVALUATION NAME AND ID	STUDY APPROACH
Recreation Resources Inventory Study	• Chelan PUD inventoried all FERC-approved recreation sites in the Rock Island Project Boundary. • Chelan PUD provided general documentation of non-Rock Island Project recreation sites that are not regulated by FERC but are within the Rock Island Project Boundary. • Chelan PUD identified comparable developed public recreation sites and facilities within the general vicinity of the Rock Island Project.

6.6.4 Integrated Licensing Process Proposed Studies

In addition to the recreation study conducted in early engagement, Chelan PUD proposes to develop an additional relicensing study (Table 6.6-2). The study plan will be included in the PSP.

Table 6.6-2 Proposed Studies to be Developed During Relicensing

STUDY NAME AND ID	STUDY APPROACH
Recreation Resources Use and Needs Forecast Study	Chelan PUD proposes to characterize the existing use of the five FERC-approved recreation sites and identify current and future recreation needs at the Rock Island Project.

6.6.5 Studies Discussed, Not Proposed

No additional studies were discussed during early engagement nor requested by the TWG participants.

6.7 Land Use

Land use resources, including existing measures, are described in Section 5.7.

6.7.1 Known and Potential Issues

There are no known or potential adverse issues or impacts to land use resources with the continued operation and maintenance of the Rock Island Project. During early engagement, three opportunities to improve the Project Boundary were identified.

Two areas were identified that are not currently in the Rock Island Project Boundary but are needed for Rock Island Project purposes. These include land under the primary transmission lines near the McKenzie and Valhalla switchyards (Section 4.4.7), and the Home Water Wildlife Preserve (Section 5.4.7.1). The primary transmission lines are part of the Project works. The Home Water Wildlife Preserve is set aside for wildlife habitat mitigation for the Rock Island Project.

A third area, encompassing the Rock Island Ponds (Figure 5.2-2), is located within the Rock Island Project Boundary, but is not needed for any Project purpose, nor are there any license articles or other license requirements that pertain to these lands.

6.7.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Chelan PUD proposes to add the lands under the primary transmission lines and associated with the Home Water Wildlife Preserve to the Rock Island Project Boundary, and to remove the Rock Island Ponds area from the Rock Island Project Boundary.

Additionally, Chelan PUD proposes the continued maintenance of its non-FERC required SMM related to land use at the Rock Island Project.

6.7.3 Studies and Evaluations Conducted During Early Engagement

There were no studies or evaluations conducted during early engagement relating to land use.

6.7.4 Integrated Licensing Process Proposed Studies

Chelan PUD is not proposing any land use studies.

6.7.5 Studies Discussed, Not Proposed

No studies related to land use were discussed during early engagement nor requested by the TWG participants.

6.8 Aesthetic Resources

Aesthetic resources, including existing measures, are described in Section 5.8.

6.8.1 Known and Potential Issues

There are no known or potential adverse issues or impacts to aesthetic resources with the continued operation and maintenance of the Rock Island Project.

6.8.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Based on the discussion in Section 5.8, Chelan PUD is not proposing any PM&E measure related to aesthetic resources at this early stage of the ILP.

6.8.3 Studies and Evaluations Conducted During Early Engagement

There were no studies or evaluations conducted during early engagement for the aesthetic resources area.

6.8.4 Integrated Licensing Process Proposed Studies

Chelan PUD is not proposing any aesthetic resources studies.

6.8.5 Studies Discussed, Not Proposed

No studies related to aesthetic resources were discussed during early engagement nor requested by the TWG participants.

6.9 Cultural and Historic Resources

Cultural and historic resources, including existing measures, are described in Section 5.9.

An early engagement TWG was not established for purposes of discussing cultural and historic resources. Once FERC designates Chelan PUD as its non-federal representative for purposes of conducting day-to-day consultation under Section 106 of the NHPA, in accordance with FERC's regulations at 18 CFR § 5.8(b), Chelan PUD will conduct outreach to all interested participants and may initiate a Cultural and Historic Resources TWG.

6.9.1 Known and Potential Issues

The operation of the Rock Island Project affects archaeological resources, may affect places of traditional religious and cultural importance to a Tribe or Native Hawaiian, and/or historic built environment resources.

There were no issue statements developed for cultural and historic resources during early engagement.

6.9.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

As required under the current license, Chelan PUD has a Cultural Resources Management Plan (CRMP) for the Rock Island Project. Chelan PUD will work with Tribes, DAHP, and FERC staff to develop a modernized Historic Properties Management Plan during the relicensing of the Rock Island Project, which will supersede the current CRMP during the upcoming new license term.

6.9.3 Studies and Evaluations Conducted During Early Engagement

There were no studies or evaluations conducted during early engagement for cultural resources.

6.9.4 Integrated Licensing Process Proposed Studies

Based on previous cultural resources surveys in the general area and those specifically performed for the Rock Island Project, prior to and over the current license duration, existing cultural and historic resources information is well known for the Rock Island Project, see Section 5.9. Acting as FERC's non-federal representative, Chelan PUD will consult with DAHP and applicable Tribes on the proposed Area of Potential Affect (APE). In addition, Chelan PUD proposes to conduct an archaeological assessment of the decided APE for the Rock Island Project (Table 6.9-1). The study plan will be included in the PSP.

Table 6.9-1 Proposed Study to be Developed During Relicensing

STUDY NAME AND ID	STUDY APPROACH
Archaeological Assessment of the Area of Potential Effect (APE)	Chelan PUD proposes to conduct an archaeological assessment of the Rock Island Project. The study will consist of compiling detailed information of previously recorded archaeological resources and archaeological inventory surveys within the APE. Information presented in this study will be used by Chelan PUD in consultation with DAHP and Tribes to assess the adequacy of resource documentation and management, and inventory survey completeness. Depending on results of the data review phase, additional fieldwork may be needed. For archaeological resources, information compiled may include age, size, condition, basic material culture present, work history (e.g., recording, evaluative and data recovery excavation, condition monitoring), and eligibility status. For the archaeological data review, compiled information will include surveyors, dates, results, and an assessment of survey adequacy. Spatial GIS data and qualitative and quantitative tabular data will be compiled for both data sets.
Historic Built Environment Assessment of the APE	Chelan PUD proposes to assess the historic built environment (HBE) within the Rock Island Project APE. This assessment will consist of compiling detailed information on previously recorded HBE resources and HBE inventory efforts. This information will be used in consultation with DAHP and the Tribes to assess the adequacy of resource documentation and management, and inventory survey completeness.

6.9.5 Studies Discussed, Not Proposed

No studies were discussed nor requested during early engagement. Study consultation and engagement with Tribes and DAHP related to cultural resources studies will be determined once FERC designates Chelan PUD as its non-federal representative for purposes of conducting day-to-day consultation under section 106 of the NHPA.

6.10 Tribal Resources

An early engagement TWG was not established for purposes of discussing tribal resources. Engagement with Tribes will be determined once the relicensing process is underway.

6.10.1 Known and Potential Issues

The operation of the Rock Island Project may impact tribal resources, but as explained in Section 5.10, there were no issue statements developed for tribal resources during early engagement.

6.10.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Based on the discussion in Section 5.10, Chelan PUD is not proposing any PM&E measures related to tribal resources at this early stage of the ILP.

6.10.3 Studies and Evaluations Conducted During Early Engagement

There were no studies or evaluations conducted during early engagement for tribal resources.

6.10.4 Integrated Licensing Process Proposed Studies

Chelan PUD is not unilaterally proposing any tribal resources studies but anticipates future discussion and coordination with interested participants.

6.10.5 Studies Discussed, Not Proposed

No studies related to tribal resources were discussed nor requested during early engagement. Study consultation and engagement with Tribes will be determined once the relicensing process is underway.

6.11 Socioeconomic Resources

Socioeconomic resources, including existing measures, are described in Section 5.11.

6.11.1 Known and Potential Issues

There are no known or potential adverse issues or impacts to socioeconomic resources associated with the continued operation and maintenance of the Rock Island Project.

6.11.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Based on the discussion in Section 5.11, Chelan PUD is not proposing any PM&E measure related to socioeconomic resources at this early stage of the ILP.

6.11.3 Studies and Evaluations Conducted During Early Engagement

There were no studies or evaluations conducted during early engagement for the socioeconomic resources area.

6.11.4 Integrated Licensing Process Proposed Studies

Chelan PUD is not proposing any socioeconomic resource studies.

6.11.5 Studies Discussed, Not Proposed

No studies related to socioeconomic resources were discussed during early engagement nor requested by the TWG participants.

6.12 Environmental Justice

Environmental justice, including existing measures, is described in Section 5.12.

6.12.1 Known and Potential Issues

There are no known adverse issues or impacts to EJ communities associated with the continued operation and maintenance of the Rock Island Project. Chelan PUD will continue to tailor its outreach regarding the licensing process to ensure that EJ communities have the opportunity to be meaningfully involved.

6.12.2 Existing or Proposed Protection, Mitigation, and Enhancement Measures

Based on the discussion in Section 5.12, Chelan PUD is not proposing any PM&E measure related to Environmental Justice at this early stage of the ILP.

6.12.3 Studies and Evaluations Conducted During Early Engagement

Chelan PUD applied the criteria from USEPA's Promising Practices guidance to identify EJ communities during early engagement, see Section 5.12.1. Though EJ communities were identified, no EJ issues were identified during the preliminary analysis.

6.12.4 Integrated Licensing Process Proposed Assessment

Based on USEPA's Promising Practices guidance, Chelan PUD is proposing an EJ assessment to support the relicensing of the Rock Island Project (Table 6.12-1). This assessment will include input from EJ communities received from Chelan PUD's tailored outreach. The assessment will also consider the Council on Environmental Quality-proposed regulatory provisions pertaining to EJ issued on July 31, 2023 (88 Federal Register 49924). The plan for the proposed EJ assessment will be included in the PSP.

Table 6.12-1 Proposed Assessment to be Developed During Relicensing

ASSESSMENT AND ID	ASSESSMENT APPROACH
Environmental Justice Assessment	Chelan PUD proposes to use the USEPA 2016 Promising Practices guidance document (described in Section 5.12), as well as Council on Environmental Quality's proposed NEPA Act Phase 2 regulations, as guidelines for conducting this assessment. The proposed EJ assessment will include the following: • Outreach to EJ communities within and near the Rock Island Project Boundary to solicit input on the relicensing process.

ASSESSMENT AND ID	ASSESSMENT APPROACH
	• Assess whether there are impacts from the Rock Island Project on EJ communities and, if so, whether those impacts are adverse, significant, and disproportionate. • Assess whether there are any climate change benefits or impacts associated with the Rock Island Project that could affect EJ communities. If such impacts are identified, assess mitigation options.

6.12.5 Studies Discussed, Not Proposed

No studies related to Environmental Justice were discussed during early engagement nor requested by the TWG participants.

6.13 References

United States Fish and Wildlife Service (USFWS). 2017. Interim Survey Requirements for Ute Ladies'-tresses (*Spiranthes diluvialis*). November 23, 1992. Revised 2017. Available online: https://www.fws.gov/media/1992-interim-survey-requirments-ute-ladies-treses-revised-2017pdf.

7.0 RELEVANT RESOURCE MANAGEMENT PLANS

7.1 Relevant Qualifying Federal or State and Tribal Comprehensive Waterways Plans

This section describes relevant qualifying federal and state comprehensive waterway plans and relevant resource management plans. FERC content requirements for this section are specified in 18 CFR §§ 5.6(d)(4)(iii) and 5.6(d)(4)(iv).

The following describes the comprehensive plans that are relevant to the relicensing of the Rock Island Project, based on a review of FERC's September 2023 List of Comprehensive Plans (FERC 2023) and a review of other relevant planning documents. The effects of the Rock Island Project activities will be evaluated with respect to each of these comprehensive plans as the relicensing process proceeds. The purpose of the evaluation will be to ensure that operation and maintenance of the Rock Island Project will be best adapted to a comprehensive plan for the waterway.

On April 27, 1988, FERC issued Order No. 481, establishing that FERC will accord the FPA Section 10(a)(2)(A) comprehensive plan status to any federal or state plan that:

- Is a comprehensive study of one or more of the beneficial uses of a waterway or, waterways;
- Specifies the standards, the data, and the methodology used; and
- Is filed with the Secretary of the Commission.

FERC currently lists 109 federal, state or tribal comprehensive waterways plans for the state of Washington (FERC 2023). Of these listed plans, 43 have been identified as potentially relevant to the Rock Island Project (Table 7.1-1).

Table 7.1-1 Qualifying Federal, State, or Tribal Comprehensive Waterways Plans Potentially Relevant to the Rock Island Project

COMPREHENSIVE PLAN
Bureau of Land Management. 1987. Spokane resource area management plan. Department of the Interior, Spokane, Washington. May 1987.
Bureau of Land Management. Forest Service. 1994. Standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the Northern Spotted Owl. Washington, DC. April 13, 1994.
Bureau of Land Management. Forest Service. 1996. Status of the Interior Columbia Basin: Summary of scientific findings. Portland, Oregon. November 1996.
Forest Service. 1990. Wenatchee National Forest land and resource management plan. Department of Agriculture, Wenatchee, Washington.

COMPREHENSIVE PLAN
Interagency Committee for Outdoor Recreation. Washington State Comprehensive Outdoor Recreation Planning Document: 2002- 2007. Olympia, Washington. October 2002.
Interagency Committee for Outdoor Recreation. 1995. Washington state outdoor recreation and habitat: Assessment and policy plan 1995-2001. Tumwater, Washington. November 1995.
Interagency Committee for Outdoor Recreation. 1991. Washington state trails plan: policy and action document. Tumwater, Washington. June 1991
National Marine Fisheries Service. 2002. Anadromous Fish Agreement and Habitat Conservation Plan: The Wells Hydroelectric Project (FERC Project No. 2149). Portland, Oregon. March 26, 2002.
National Marine Fisheries Service. 2008. Mainstem Columbia River Hydropower Projects Recovery Plan Module. Portland, Oregon. September 2008.
National Marine Fisheries Service. 2009. Middle Columbia River steelhead distinct population segment Endangered Species Act Recovery Plan. Portland, Oregon. November 30, 2009.
National Marine Fisheries Service. 2011. Columbia River Estuary ESA Recovery Plan Module for Salmon and Steelhead. Portland, Oregon. January 2011.
National Marine Fisheries Service. Pacific Fishery Management Council. 1978. Fishery management plan for commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California commencing in 1978. March 1978.
National Park Service. 1993. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.
Northwest Power and Conservation Council. 1988. Protected areas amendments and response to comments. Portland, Oregon. Council Document 88-22. September 14, 1988.
Northwest Power and Conservation Council. 2014. Columbia River Basin Fish and Wildlife Program. Portland, Oregon. Council Document 2014-12. October 2014.
Northwest Power and Conservation Council 2020. 2020 Addendum to the 2014 Columbia River Basin Fish and Wildlife Program. Portland, Oregon. Council Document 2020-9. October 2020.
Northwest Power and Conservation Council. 2022. The 2021 Northwest Power Plan. Portland, Oregon. Council Document 2022-03. February 2022.
Pacific Fishery Management Council. 1988. Eighth amendment to the fishery management plan for commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California commencing in 1978. Portland, Oregon. January 1988.
Pacific Fishery Management Council. 2014. Appendix A to the Pacific Coast salmon fishery management plan, as modified by amendment 18 to the Pacific Coast Salmon Plan: identification and description of essential fish habitat, adverse impacts, and recommended conservation measures for salmon. Portland, Oregon. September 2014.
Public Utility District No. 1 of Chelan County. 2023. Avian Protection Plan. June 2023.
State of Idaho. State of Oregon. State of Washington. Confederated Tribes of the Warm Springs Reservation of Oregon. Confederated Tribes of the Umatilla Indian Reservation. Nez Perce Tribe. Confederated Tribes and Bands of the Yakima Indian Nation. 1987. Settlement Agreement pursuant to the September 1, 1983, Order of the United States District Court for the District of Oregon in Case No. 68-5113. Columbia River fish management plan. Portland, Oregon. November 1987.
State of Washington. 1977. Statute establishing the state scenic river system, Chapter 79.72 Revised Code of Washington. Olympia, Washington.
United States Fish and Wildlife Service. 2013. Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report. Denver, Colorado. February 2013.

COMPREHENSIVE PLAN
United States Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the United States Fish and Wildlife Service. Washington, DC.
United States Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.
Upper Columbia Salmon Recovery Board. 2007. Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan. Okanogan, Washington. August 2007.
Washington Department of Community Development. Office of Archaeology and Historic Preservation. 1987. Resource protection planning process - Paleoindian study unit. Olympia, Washington.
Washington Department of Community Development. Office of Archaeology and Historic Preservation. 1987. Resource protection planning process - Mid-Columbia study unit. Olympia, Washington.
Washington Department of Community Development. Office of Archaeology and Historic Preservation. 1987. A resource protection planning process identification component for the eastern Washington protohistoric study unit. Olympia, Washington.
Washington Department of Community Development. Office of Archaeology and Historic Preservation. 1989. Resource protection planning process - study unit transportation.
Washington Department of Ecology. 1982. Wenatchee River Basin instream resources protection program. Olympia, Washington. December 1982.
Washington Department of Ecology. 1994. State wetlands integration strategy. Olympia, Washington. December 1994.
Washington Department of Ecology. 1986. Application of shoreline management to hydroelectric developments. Olympia, Washington. September 1986.
Washington Department of Ecology. 1982. Instream resource protection program for the main stem Columbia River in Washington state. Olympia, Washington.
Washington Department of Fisheries. 1987. Hydroelectric project assessment guidelines. Olympia, Washington.
Washington Department of Fish and Wildlife. 1997. Management recommendations for Washington's priority habitats: Riparian. Olympia, Washington. December 1997.
Washington Department of Fish and Wildlife. 2004. Management recommendations for Washington's Priority Species, Volume IV: Birds. Olympia, Washington. May 2004.
Washington Department of Fish and Wildlife. 2005. Washington's comprehensive wildlife conservation strategy. Olympia, Washington. September 19, 2005.
Washington Department of Game. 1987. Strategies for Washington's wildlife. Olympia, Washington. May 1987.
Washington Department of Natural Resources. 1987. State of Washington natural heritage plan. Olympia, Washington.
Washington Department of Natural Resources. 1997. Final habitat conservation plan. Olympia, Washington. September 1997.
Washington State Energy Office. 1992. Washington state hydropower development/resource protection plan. Olympia, Washington. December 1992.
Washington State Parks and Recreation Commission. 1988. Washington state scenic river assessment. Olympia, Washington. September 1988.
Washington State Parks and Recreation Commission. 1988. Scenic rivers program - report. Olympia, Washington. January 29, 1988.

Source: FERC 2022

7.2 Additional Relevant Resource Management Plans

Additional waterway planning documents and resource management plans, including regional plans not included on the FERC's September 2023 List of Comprehensive Plans, have been identified as potentially being relevant to the Rock Island Project. These plans are listed in Table 7.2-1.

Table 7.2-1 Additional Resource Management Plans Potentially Relevant to the Rock Island Project

RESOURCE MANAGEMENT PLAN
Chelan County. 2017. Chelan County Comprehensive Plan 2017-2037.
City of East Wenatchee. 2019. Greater East Wenatchee Area Comprehensive Plan. City of East Wenatchee; Douglas County.
City of Wenatchee. 2020. Planning to Blossom 2037: Wenatchee Urban Area Comprehensive Plan.
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APPENDIX A PROJECT LICENSE, AMENDMENTS, AND CURRENT LICENSE REQUIREMENTS

The Rock Island Project's 40-year license was issued January 18, 1989 (Attachment 1) and expires December 31, 2028. The Rock Island Project FERC license has been amended throughout the license term. Table 1 below summarizes current license articles, conditions, and orders/amendments for the Rock Island Project license. The license is subject to the standard articles set forth in Form L-5, (October 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States," (Table 1, Articles 1 through 37) as well as additional articles (Table 1, Recreation Management Plan [Exhibit R] through Article 416). Please note that some requirements are summarized or condensed for the purpose of brevity. Additionally, some orders and amendments may pertain to more than one license article; these have been included in Table 1 only once, under the most applicable article, to reduce redundancy.

Table 1 Rock Island Project License Articles, Conditions, and Amendments

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 1, Form L-5 (October 1975) [Attachment 1]	Entire Rock Island Project is subject to all the terms of the license.	Order on Remand Issuing License (Major) and Approving Settlement Agreement.	01/18/1989	19890125-0490	46 FERC ¶ 61,033
Article 2, Form L-5 (October 1975) - also related to Articles 3 and 302	All substantial changes to the license exhibits must be approved by FERC.	Order Assigned Exhibit L Numbers for All Drawings, Except 11-12 and 15-18 Due to Impending Left and Right Bank Fishway Modifications.	01/28/1989	N/A	N/A
		Approved As-Built Exhibit L Drawings of the Right Bank Fishway Modifications.	06/30/1989	19890706-0032	47 FERC ¶ 62,326
		Order Amending License for Microturbine Installation.	03/14/2002	20020318-0009	98 FERC ¶ 61,279
		Order Modifying and Approving Adult Fishway Attraction Water Conduit Turbine Plan under the March 14, 2002 Order.	03/14/2003	20030314-3015	102 FERC ¶ 61,171

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
		Order Amending License to Incorporate Generators and Dismiss Pending Requests for Rehearing.	10/27/2003	20031027-3022	105 FERC ¶ 61,132
		Errata Notice Revising the New Drawing Numbers for Exhibit L Drawings.	06/17/2011	20110617-4007	-
		Issued Order Amending License, Revising Authorized Installed Capacity and Annual Charges for Unit B4.	10/24/2022	20221024-3038	181 FERC ¶ 62,058
		Order Amending License, Revising Authorized Installed Capacity and Annual Charges and Approving Revised Exhibit A.	06/28/2023	20230628-3009	183 FERC ¶ 62,167
Article 3, Form L-5 (October 1975)	Rock Island Project will be in conformity with the approved exhibits.	N/A	-	-	-
Article 4, Form L-5 (October 1975)	Rock Island Project construction, operation, and maintenance is subject to inspection and supervision of FERC. Allow free access to the project site for any federal employee during the performance of their official duties.	N/A	-	-	-
Article 5, Form L-5 (October 1975)	Acquire, within five years of license order issuance, sufficient property rights necessary or appropriate for the construction, maintenance, and operation of the Rock Island Project. Cannot transfer, lease, or otherwise impact these lands without FERC approval.	N/A	-	-	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 6, Form L-5 (October 1975)	In event of federal takeover, licensee will correct any title defects for Rock Island Project lands described in Article 5.	N/A	-	-	-
Article 7 – Form L-5 (October 1975), FPA 4(b), and 18 CFR Part 4 Subpart A	FERC will determine the actual legitimate original cost of the original Rock Island Project and any additions or betterments.	N/A	-	-	-
Article 8 - Form L-5 (October 1975)	Install, maintain, meter, and monitor gages and stream gaging stations in cooperation with the USGS. Advance funds to the USGS for their time and effort "for such periods as may be mutually agreed upon." Install and maintain electric generation meters. Submit records to FERC annually as prescribed.	N/A	-	-	-
Article 9, Form L-5 (October 1975)	FERC has authority to order additional capacity installed or other changes as project is deemed to be in the public interest, after notice and opportunity for hearing.	N/A	-	-	-
Article 10, Form L-5 (October 1975)	FERC's authority to order Rock Island Project operation to be coordinated with other projects or power systems as determined in the public interest.	N/A	-	-	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 11, Form L-5 (October 1975) and 18 CFR Part 11, Subpart B	Headwater benefits.	Order Approving Headwater Benefits Settlement Agreement.	09/15/2000	20000919-0101	92 FERC ¶ 61,218
		Order Approving Amendment to Headwater Benefits Settlement Agreement.	09/17/2003	20030917-3024	104 FERC ¶ 62,202
Article 12, Form L-5 (October 1975)	Reservation of authority for USACE to determine need for navigational flows at the Rock Island Project.	N/A	-	-	-
Article 13, Form L-5 (October 1975)	Other entities may apply for reasonable use of Rock Island Reservoir and properties in the interests of comprehensive development of the Rock Island Project resources. Compensation to licensee for use and reimbursement of damages allowed.	N/A	-	-	-
Article 14, Form L-5 (October 1975)	Place and maintain Rock Island Project transmission lines to reduce the liability of contact between Project transmission lines and other utility lines, highways, streets, and railroads.	N/A	-	-	-
Article 15, Form L-5 (October 1975)	Licensee shall construct, maintain, and provide such protective devices and comply with such reasonable modification of the Rock Island Project structures and operation in the interest of fish and wildlife resources as may be prescribed by FERC upon recommendation by state and federal agencies.	N/A	-	-	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 16, Form L-5 (October 1975)	Licensee shall allow United States government free access to Rock Island Project lands and facilities for the purpose of constructing or improving fish and wildlife facilities at the Project (includes operational changes).	N/A	-	-	-
Article 17, Form L-5 (October 1975)	Licensee shall construct, maintain, and operate such reasonable recreational facilities as ordered by FERC during the term of the license.	N/A	-	-	-
Article 18, Form L-5 (October 1975)	Licensee shall allow public free access, as reasonable, to Rock Island Project waters and lands owned by the licensee for recreational purposes.	N/A	-	-	-
Article 19, Form L-5 (October 1975)	Licensee will take reasonable measures to prevent soil erosion, stream sedimentation, and any forms of air or water pollution. FERC retains authority to order measures to address these issues.	N/A	-	-	-
Article 20, Form L-5 (October 1975)	Licensee shall dispose of all material unnecessary for the purposes of the Rock Island Project, which results from land clearing or maintenance / alteration of the Rock Island Project works. Also remove all trees that die along reservoir shoreline.	N/A	-	-	-
Article 21, Form L-5 (October 1975)	Dredging or filling of material in navigable waters during Rock Island Project construction or maintenance will be performed to the satisfaction of the USACE.	N/A	-	-	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 22, Form L-5 (October 1975)	Licensee shall convey to the United States, free of cost, any lands, rights-of-ways needed to construct, complete, or improve navigation facilities at the Rock Island Project — and permit such control of pools as needed to complete and operate facilities.	N/A	-	-	-
Article 23, Form L-5 (October 1975)	Operation of any navigational facilities will be governed by reasonable rules set by USACE.	N/A	-	-	-
Article 24, Form L-5 (October 1975)	Furnish free of cost power needed to operate and maintain United States navigation facilities.	N/A	-	-	-
Article 25, Form L-5 (October 1975)	Licensee will construct, maintain, and operate at its own expense such lights and signals as needed for safe navigation, as determined by the U.S. Coast Guard.	N/A	-	-	-
Article 26, Form L-5 (October 1975)	Timber on United States lands cut, used, or destroyed in the construction and maintenance of the Rock Island Project will be paid for at the going rate. Timber cutting debris will be disposed of properly.	N/A	-	-	-
Article 27, Form L-5 (October 1975)	Prevent and suppress fires on or near Rock Island Project lands.	N/A	-	-	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 28, Form L-5 (October 1975)	U.S. agencies and lessees on United States lands have water rights for fire suppression, and sanitary or domestic purposes.	N/A	-	-	-
Article 29, Form L-5 (October 1975)	Licensee is liable for damage to or destruction of any United States-owned buildings, bridges, roads, during project construction and maintenance.	N/A	-	-	-
Article 30, Form L-5 (October 1975)	Licensee shall allow United States agencies to construct roads, conduits, and other means of transportation and communication on Rock Island Project lands of the United States.	N/A	-	-	-
Article 31, Form L-5 (October 1975)	Standards for construction and maintenance of roads and trails on (and other uses of) lands of the United States are subject to approval of agency having supervision over the lands involved.	N/A	-	-	-
Article 32, Form L-5 (October 1975)	Avoid inductive interference between Rock Island Project transmission lines and any radio installation, telephone line, or other communication facility constructed before or after the Project to the satisfaction of the affected United States agency.	N/A	-	-	-
Article 33, Form L-5 (October 1975)	Maintenance to transmission line corridors to avoid tree contact.	N/A	-	-	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 34, Form L-5 (October 1975)	Riparian vegetation management along reservoir.	N/A	-	-	-
Article 35, Form L-5 (October 1975)	Licensee must keep Rock Island Project in good operating condition.	N/A	-	-	-
Article 36, Form L-5 (October 1975)	Chelan PUD's rights to use government property to operate the Rock Island Project ceases if FERC does not issue a new hydro operating license.	N/A	-	-	-
Article 37, Form L-5 (October 1975)	Terms of license to not supersede or impair any terms and conditions for hydropower projects licensed under the Federal Power Act.	N/A	-	-	-
Recreation Management Plan (Exhibit R)	Management of recreational facilities constructed at Rock Island Project under original license.	Order Approving Recreation Drawings filed by Chelan on 08/22/89 showing realigned hiking trails to reduce human presence near a bald eagle nesting site.	05/25/1990	19900530-0189	51 FERC ¶ 62,183
		Order Approving Revised Recreation Plan and Revised Exhibits G and R As-built Drawings (Rock Island Hydro Park [Kirby Billingsley Hydro Park], Walla Walla Point Park, Wenatchee Confluence State Park, Wenatchee Riverfront Park).	06/18/1993	19930624-0129	63 FERC ¶ 62,299
		Order Approving Exhibit R As-Built Drawings of Walla Walla Point and Confluence Park.	10/07/1997	19971009-0374	81 FERC ¶ 62,012
		Order Amending Recreation Plan (Wenatchee Riverfront Park).	02/28/2008	20080228-3016	122 FERC ¶ 62,192

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
		Order Amending Project Boundary (Wenatchee Confluence State Park).	06/05/2008	20080605-3022	123 FERC ¶ 62,195
		Order Amending Project Boundary and Project Recreation Plan and Approving Change in Project Land Rights (Wenatchee Riverfront Park).	09/02/2008	20080902-3022	124 FERC ¶ 62,164
		Order Approving Revised Exhibit R (Wenatchee Confluence Park).	12/04/2008	20081204-3031	125 FERC ¶ 62,227
		Order Approving As-built Drawing (Wenatchee Riverfront Park).	04/12/2011	20110412-3033	135 FERC ¶ 62,026
		Errata Notice to 04/12/2011 Order Approving As-Built Drawing (Wenatchee Riverfront Park).	04/14/2011	20110414-3055	-
		Order Amending Recreation Plan and Amending Project Boundary.	03/15/2018	20180315-3058	162 FERC ¶ 62,165
		Order Approving Revised Exhibit G Drawings for Coyote Dunes.	08/01/2018	20180801-3039	164 FERC ¶ 62,056
		Order Approving Coyote Dunes Natural Area Management Plan.	03/15/2023	20230315-3011	182 FERC ¶ 62,153
		Order Amending Recreation Management Plan for Walla Walla Point Park.	07/06/2023	20230706-3016	184 FERC ¶ 62,010
		Order Amending Recreation Management Plan for Wenatchee Riverfront Park.	07/20/2023	20230720-3004	184 FERC ¶ 62,034
Article 201	Annual Fees – Reporting, Assessment and Payment.	Order Amending License, Revising Annual Charges, and Approving Revised Exhibit M. Revised authorized installed capacity to 409.6 MW.	09/22/2004	20040922-3016	108 FERC ¶ 62,258
		Order Amending Annual Charges. Non-transmission federal lands reduced to 9.83 acres.	05/11/2009	20090511-3059	127 FERC ¶ 62,121
		Errata Notice to 05/11/2009 Order removing transmission acres of 0.07 acres and removing Article 201(c) from the license.	06/05/2009	20090605-3051	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
		Order Amending License and Revising Annual Charges.	06/09/2011	20110609-3056	135 FERC ¶ 62,207
		Order Accepting Photographs of New Nameplates and Clarifying Prior Amendment Order.	12/14/2011	20111214-3009	137 FERC ¶ 62,232
		Declaratory Order. Petition for declaratory order filed by Power Site Reservation Fees Group on 11/21/2012 is granted.	03/21/2013	20130321-3044	142 FERC ¶ 61,196
		Order Amending License and Revising Annual Charges.	01/24/2014	20140124-3072	146 FERC ¶ 62,055
		Order Amending Licenses, Revising Annual Charges, Approving Revised Exhibits A and Deleting Exhibit F and L Drawings	10/12/2017	20171012-3077	161 FERC ¶ 62,028
		Order Amending License, Revising Annual Charges, and Approving Revised Exhibit M for change in capacity of unit B-6.	11/20/2018	20181120-3091	165 FERC ¶ 62,108
Article 301	Testing and monitoring as recommended by the Board of Consultants.	Order Approving As-Built Exhibit G and designating FERC numbers for these drawings; namely, Exhibit G Index and Sheets 1 – 25; FERC Nos 943-229 thru -254 respectively.	02/20/1990	19900223-0296	50 FERC ¶ 62,105
Article 302	As-built Exhibit G drawings.	Order Amending Project Boundary.	06/05/2008	20080605-3022	123 FERC ¶ 62,195
		Order Approving Revised Exhibit G Drawings.	04/22/2009	20090422-3039	127 FERC ¶ 62,059
		Errata Notice to the 04/22/2009 Order.	04/23/2009	20090423-3022	-
		Order Modifying and Approving Project Boundary and As-Built Exhibits Pursuant to Articles 402 and 413(c).	04/04/2013	20130404-3009	143 FERC ¶ 62,013

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
		Errata Notice to 04/04/2013 Order Modifying and Approving Project Boundary and As-Built Exhibits Pursuant to Articles 402 and 413(c).	04/11/2013	20130411-3028	-
		Errata Notice to 04/04/2013 Order Modifying and Approving Project Boundary and As-Built Exhibits Pursuant to Articles 402 and 413(c).	04/12/2013	20130412-3015	-
		Order Approving As-Built Exhibits L Drawings (Sheets 11-12, 15-18, and Relabeling L-19).	10/17/2013	20131017-3039	145 FERC ¶ 62,040
Article 401	Implementation and annual reporting of the fisheries protection measures required under Sections B through F of the Rock Island Settlement Agreement. Art 401 deleted by Order Approving HCP issued June 21, 2004, and clarified in Order on Rehearing issued November 23, 2004.	Order on Rehearing, which removed Article 401 from the license.	11/23/2004	20041123-3074	109 FERC ¶ 61,208
Article 402	Design, construction, and operation of the fish hatcheries required under the Rock Island Settlement Agreement, Section E. Art 402 deleted by Order Approving HCP issued June 21, 2004, and clarified in Order on Rehearing issued November 23, 2004.	Order on Rehearing, which removed Article 402 from the license.	11/23/2004	20041123-3074	109 FERC ¶ 61,208
Article 403	Development and Implementation of a Wildlife Management Plan for the 1,000-acre Water District Lands	FERC issues letter accepting final filed 12/28/1992 Wildlife Habitat Report satisfying Article 403.	01/26/1993	19930203-0231	-

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
	located west of Wenatchee. Provide annual funding for a three-year period to develop and enhance riparian habitat in the Swakane fire area.	Order Approving Wildlife Management Plan with Modification.	12/08/1989	19891212-0317	49 FERC ¶ 62,215
Article 404 / 405	Bald Eagle Protection Measures at Wenatchee River Confluence Recreational Sites.	Order Approving Bald Eagle Monitoring Plan.	09/07/1990	19900907-0018	53 FERC ¶ 62,088
	Development and implementation of Bald Eagle Monitoring Plan.	Order Approving 11/02/92 Final Report and Determines Report Satisfies Article 405 of License.	03/29/1993	19930406-0242	-
Article 406	Gosling Mortality Study.	Order Approving Canada Goose Gosling Mortality Study Plan.	10/30/1990	19901030-3047	69 FERC ¶ 62,204
		Order Approving Plan Monitoring Degree of Mortality of Canada Goose Goslings.	11/01/1990	19901101-0539	-
		Order Approving Final Report on Gosling Mortality and Amending License Filed by Chelan on 10/25/1994.	12/09/1994	19941214-0249	-
Article 407	Wood Duck Nest Box Monitoring Plan.	Order Approving Wood Duck Nest Box Use Monitoring Plan.	10/30/1990 11/01/1990	19901030-3055 19901101-0533	53 FERC ¶ 62,087
Article 408	Rare and Sensitive Plant Species Survey.	FERC Letter Stating the Results of Chelan PUD's 01/11/1990 FERC-filed Rare and Sensitive Plan Species Survey, Fulfill the Requirements of Article 408 for the License.	10/29/1990	19901105-0135	-
Article 409 / Article 410	Art 409: Development and implementation of a Cultural Resource	Order Approving Cultural Resources Management Plan and Memorandum of Understanding.	12/19/1990	19901221-0104	53 FERC ¶ 62,255

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
	Management Plan designed to protect NRHP-eligible historic properties. Art 410: Mandated consultation on historic properties prior to planned ground-disturbances.	Order Amending License to Implement the Terms of the HCP includes in Ordering Paragraph (F) a modification of the Cultural Resources Management Plan to include ground-disturbing activities on non-federal land pursuant to the Tributary Conservation Plan provisions of the HCP.	06/21/2004	20040621-3047	107 FERC ¶ 61,282
Article 411	Standard FERC reopener clause to amend project facilities or operation as needed to assure compliance with a range of management programs.	N/A	-	-	-
Article 412	Standard Land Use Article.	N/A	-	-	-
Article 413 (added by Order Approving HCP issued June 21, 2004, [Attachment 2])	Implement provisions of HCP for Wells, Rocky Reach and Rock Island Projects. Incorporates requirement to file report on implementation measures with FERC annually.	Order Amending License to Implement the Terms of the HCP.	06/21/2004	20040621-3047	107 FERC ¶ 61,282
		Order Granting Interventions, Approving Anadromous Fish Agreements, Settlement Agreement, and Applications to Amend Licenses; and Terminating Proceeding. Order amending 3 project licenses (Rock Island, Rocky Reach, Wells) for the HCP.	06/21/2004	20040621-3044	107 FERC ¶ 61,280
		Order Amending Reporting Date for Annual Habitat Conservation Plan Reports Pursuant to Articles 410 and 413.	06/28/2022	20220628-3031	179 FERC ¶ 62,182

ARTICLE / COMPLIANCE REQUIREMENT	DESCRIPTION	ORDER / AMENDMENT	DATE	FERC ACCESSION NUMBER	FERC CITATION
Article 414 (added by Order Approving HCP issued June 21, 2004, [Attachment 2])	Develop and implement a Bull Trout Management Plan.	Order Approving Bull Trout Management Plan under Article 414.	04/19/2005	20050419-3021	111 FERC ¶ 62,070
Article 415 (added by Order Approving HCP issued June 21, 2004, [Attachment 2])	Reporting requirements describing impacts or Reasonable and Prudent Measures and Associated Terms and Conditions for the protection of Bull Trout. Related to Bull Trout Management plan filed under Article 414.	N/A	-	-	-
Article 416 (added by Order Approving HCP issued June 21, 2004, [Attachment 2])	This is a license reopener allowing FERC to add additional requirements and measures in the future if needed to develop and implement the Bull Trout recovery plan.	N/A	-	-	-

Attachments:

Attachment 1 – January 18, 1989; Rock Island Project License.

Attachment 2 – June 21, 2004; Order Amending the Rock Island Project License to implement the terms of an Anadromous Fish Settlement and Habitat Conservation Plan (HCP).

June 21, 2004; Companion Order Granting Interventions; Approving Anadromous Fish Agreements, Settlement Agreement, and Applications to Amend Licenses; and Terminating Proceeding.

Attachment 1 January 18, 1989 - Rock Island Project License

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Martha O. Hesse, Chairman;
Charles G. Stalon, Charles A. Trabandt,
Elizabeth Anne Moler and Jerry J. Langdon.

Public Utility District No. 1 of Chelan County, Washington	)	Project No. 943-002 Docket No. E-9569-000

ORDER ON REMAND ISSUING LICENSE (Major) AND APPROVING SETTLEMENT AGREEMENT

(Issued January 18, 1989)

In this proceeding the Commission is asked to approve a settlement agreement that resolves a long-standing controversy involving impacts to juvenile anadromous fish on the Columbia River by the Rock Island Project No. 943 and to issue a new license for the project to the Public Utility District No. 1 of Chelan County, Washington (licensee or PUD), consistent with the decision of the Ninth Circuit Court of Appeals in Confederated Tribes and Bands of the Yakima Indian Nation v. FERC, 746 F.2d 466 (9th Cir. 1984) (Yakima). In view of the length and complexity of this proceeding, we review the settlement, the environmental impact statement, and various licensing matters in some detail.

Background

The Rock Island Project No. 943 is located on the Columbia River, near Wenatchee, Washington, in Chelan and Douglas Counties, about 450 miles from the Pacific Ocean. 1/ The project is a run-of-the-river hydroelectric facility with a total installed generating capacity of 622.5 MW. The project is connected to the PUD's power distribution system, the Bonneville Power

1/ Rock Island is one of five hydropower projects operating under four licenses issued by the Commission along the middle portion of the Columbia River. In ascending order on the river they are: Priest Rapids Dam and Wanapum Dam (Project No. 2114), licensed to P.U.D. No. 2 of Grant County, Washington; Rock Island Dam; Rocky Reach Dam (Project No. 2145), licensed to P.U.D. No. 1 of Chelan County, Washington; and Wells Dam (Project No. 2149), licensed to P.U.D. No. 1 of Douglas County, Washington.

Administration's (BPA) transmission grid, and the Puget Sound Power and Light Company's (Puget) distribution system. 2/

The Commission issued the initial license for the project in 1930, 3/ and the project was completed in 1933. In 1974 the Commission approved an amendment of the license to construct a second powerhouse containing eight 51.3 MW tube-type generating units and to modify the existing dam to permit the reservoir to be raised 6.1 feet. 4/ No significant changes to the project have occurred since that time.

The Rock Island Project consists of: (1) a 135-foot high and 2,524-foot long concrete gravity dam; (2) a 1,800-acre and 20-mile long reservoir, providing 130,000 acre-feet of gross storage; (3) the left bank powerhouse having a total installed capacity of 212.1 MW; (4) the right bank powerhouse having a total installed capacity of 410.4 MW; (5) six 115-kV transmission lines; and (6) appurtenant facilities. A more detailed project description is contained in ordering paragraph (B).

History of this Proceeding

On January 18, 1977, the licensee filed, pursuant to the Federal Power Act (FPA), an application for a new license for the Rock Island Project. 5/ Public notice of the application was published, and comments were received from interested federal, state, and local agencies and other entities and individuals. The Washington State Department of Fisheries (WDF), Washington State Department of Game (WDG), and the National Marine Fisheries Service (NMFS) were granted intervention.

On December 4 and 26, 1978, these agencies, together with the Oregon Department of Fish and Wildlife and the Confederated Tribes and Bands of the Yakima Indian Nation (Tribes), filed petitions asking the Commission to modify the operation of the Rock Island

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2/ Under a long-term contract the licensee sells much of the power produced by the Rock Island Project to Puget for use within Puget's service area in King County, Washington.

3/ Tenth Annual Report of the Federal Power Commission 229 (1930).

4/ 51 F.P.C. 1141 (1974).

5/ The Washington Department of Ecology issued water quality certification for the project in accordance with Section 401(a) of the Federal Water Pollution Control Act, 33 U.S.C. § 1341(a).

Project as well as the other licensed projects on the mid-Columbia River, or in the alternative to institute a proceeding to consider their requests. The petitioners claimed that commercial, Indian, and sport fisheries had suffered severe losses over the years due to the construction and operation of these projects. They sought certain minimum flows and spills and other modifications to the projects to protect juvenile salmon migrating downstream each spring.

On March 7, 1979, the Commission consolidated the petitions with a complaint filed by Washington Department of Fisheries involving Priest Rapids Dam and set the entire matter for hearing. 6/ 7/ The parties reached first a one-year interim settlement governing fish protection measures at all five dams and then a five-year interim settlement through 1984. The interim agreement provided for spill, hatchery compensation, and studies to improve fish protection and was approved by the Commission on March 20, 1980. 8/

On May 13, 1981, the Director, Office of Electric Power Regulation (Director), issued a new license to the PUD for the Rock Island Project. 9/ The Director deferred action on the intervenors' requested fish and wildlife mitigation measures pending their resolution in the above-referenced hearing process. He also required the licensee to submit a revised Exhibit S, Fish and Wildlife Report, based on pre- and post-flooding studies being conducted at the project as a result of the prior approval of the new powerhouse and raising of the reservoir. 10/ The Commission denied appeals 11/ and requests for rehearing 12/ of the order issuing the license.

6/ 6 FERC ¶ 61,210 (1979).

7/ See P.U.D. No. 1 of Grant County, Washington, 45 FERC ¶ 61,401 (1988), regarding the conclusion of the complaint phase of the consolidated proceeding.

8/ 10 FERC ¶ 61,257 (1980).

9/ 14 FERC ¶ 62,187 (1981).

10/ See note 4, supra. The licensee filed the Exhibit S on May 29, 1984.

11/ 19 FERC ¶ 61,223 (1982).

12/ 21 FERC ¶ 61,264 (1982).

The Secretary of Commerce, on behalf of NMFS, and the Tribes filed petitions for review of the relicensing orders in the Ninth Circuit Court of Appeals. On June 7, 1984, the court granted the petitions and set aside the Commission orders. 13/ The court held, inter alia. that the Commission may not defer consideration of a project's impacts on the fishery resources, and possible mitigation thereof, until after a license is issued. Instead, the Commission must evaluate the impacts and decide upon proper mitigation measures before issuing the license. 14/ The court also required that an environmental impact statement be prepared on the relicensing of the Rock Island Project. On April 4, 1985, after the Supreme Court denied the licensee's petition for certiorari, the Commission issued an annual license for Project No. 943, to be renewed until such time as the relicensing proceeding is completed.

During the pendency of judicial review, the 5-year interim settlement neared expiration, and the parties negotiated and filed on March 29, 1985, a stipulation outlining another interim program of studies and fisheries protection measures for 1985 through 1987. The stipulation included all mid-Columbia projects except Rock Island and was accepted by the presiding administrative law judge. 15/ Following a pre-hearing conference in Seattle, Washington, concerning Rock Island, the presiding administrative law judge accepted, over the objection of the fishery agencies and Tribes, the PUD's proposal for operating in the spring of 1985.

A hearing was held to determine the licensee's responsibilities for 1986 and 1987 with respect to Project No. 943. Active participants in the hearing were the PUD, Puget, NMFS, WDF, WDG, the Tribes, the National Wildlife Federation (NWF), 16/ and the Commission staff. The Northwest Power Planning Council (Council) also was represented at the hearing and filed a brief with the presiding judge. 17/

13/ See Yakima, supra.

14/ Id. at 472-73.

15/ See 34 FERC ¶ 63,044 (1986) at p. 65,165.

16/ NWF filed a motion to intervene in the proceeding on November 29, 1984, which was granted on January 10, 1985.

17/ The Council filed a motion for limited intervention on February 4, 1983, which was granted at a prehearing conference on February 15, 1983.

An initial decision with regard to Project No. 943 was issued on January 31, 1986. 18/ The presiding judge made certain findings of fact and conclusions of law with respect to project impacts, interim protection measures, and additional studies to be conducted to evaluate long-term fisheries protection and compensation measures. Exceptions to the initial decision were filed and remain pending before the Commission. 19/ During the pendency of the appeal of the exceptions to the initial decision, the licensee agreed to provide interim spill protection for downstream migrants and to initiate a logical sequence of studies of mechanical bypass systems at the project in accordance with the initial decision. A mid-Columbia Coordination Committee (MCCC) continued to function to administer the stipulation and interim programs. 20/

After these hearings were concluded, the parties continued negotiations on a potential long-term settlement agreement for the Rock Island Project. The instant agreement was finally reached on January 26, 1987, circulated for signatures, and filed on May 4, 1987. Commission staff filed comments in support of the settlement agreement on May 26, 1987. The U.S. Department of the Interior, Bureau of Indian Affairs, by letter dated May 14, 1987, concluded that the settlement agreement does not require approval of the Secretary of the Interior under 25 U.S.C. § 81. 21/ On May 26, 1987, the Council commented in support of the settlement agreement and invited the parties to submit to the Council an application to amend the Columbia River Basin Fish and Wildlife Program 22/ in order to reconcile the minor differences between them. 23/ On June 3, 1987, the presiding administrative law judge certified the

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18/ 34 FERC ¶ 63,044 (1985).

19/ As noted, the settlement under consideration would resolve these issues.

20/ The MCCC consists of representatives of the licensee, power purchasers, fisheries agencies, and Indian Tribes.

21/ This section of the United States Code regulates contracts with Indian Tribes or Indians and provides certain limitations that apply to the execution of such contracts or other agreements

22/ See 16 U.S.C. § 839b(h) (1982).

23/ The Council subsequently amended the Program to incorporate the settlement agreement. See 52 Fed. Reg. 32981 (September 1, 1987).

uncontested offer of settlement to the Commission pursuant to Rule 602 of the Commission's Rules of Practice and Procedure. 24/

The Settlement Agreement

Unlike prior agreements in this proceeding, the instant agreement provides a comprehensive and long-term resolution of the anadromous fish issues at the Rock Island Project. The agreement would be the basis for issuance of a new license and termination of the mid-Columbia Proceeding (Docket No. E-9569, et al.) for this project. The term of the agreement commenced on the date of execution by all parties thereto and runs until the expiration of the new license to be issued in the remanded proceeding, plus the term of any annual license which may be issued thereafter. (Section A.3.)

The agreement establishes licensee obligations with respect to juvenile downstream migrant bypass facilities, juvenile fish passage through spill, hatchery compensation for fish losses, and fish ladder operation for the first thirteen years of the term of the agreement. (Section A.1.) Thereafter, any party may initiate negotiations or file a petition to modify the terms and conditions or to replace the agreement in whole or in part. (Section A.4.) The parties have also agreed to continue to implement the agreement until the modification or other relief sought becomes effective by operation of law. (Section A.5.b.) Accordingly, in the absence of any such negotiation or petition for modification, the agreement will remain in effect for the term of the new license and any annual license which may be issued thereafter.

The agreement includes a dispute resolution mechanism concerning compliance. (Section A.6.) The parties would first attempt to solve any problems under the agreement by referral to the Rock Island Coordinating Committee (Committee). 25/ If the Committee cannot resolve the dispute and if the amount in controversy is $325,000 or more, the dispute may be referred to the Commission pursuant to its Rules of Practice and Procedure. If the Committee cannot resolve the dispute and if the amount in controversy is less than $325,000, any party may request expedited review, which would entail asking the Commission to refer the matter to the presiding administrative law judge in the mid-

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24/ 18 C.F.R. § 385.602 (1988).

25/ The Committee is composed of one technical representative of each party to the agreement. Besides dispute resolution, the Committee will be used as the primary means of consultation and coordination between the licensee and the fishery agencies and Tribes. (Section G.)

Columbia proceeding or referring the matter to a third party. Any decision by the judge or a third party would be effective upon issuance and subject to de novo Commission review. 26/

The settlement agreement provides for the licensee to carry out measures at the project which are designed to provide adequate protection and full compensation for project-induced losses to the fishery at least through the end of the thirteen-year initial period. The following is a summary of the licensee's obligations.

The PUD has agreed to fund and carry out a research and development program at each powerhouse to develop a workable mechanical juvenile bypass system 27/ that will safely guide the migrating juvenile salmon and steelhead around the turbines. The current schedule provides for a design by 1991 for powerhouse No. 1 and by 1992 for powerhouse No. 2. If the design, as shown by a prototype, successfully guides at least fifty percent (50%) of the fish around the dam, the PUD will be obligated to build and install a complete bypass system for that powerhouse (within specific limitations of cost, safety, and loss of generating capacity). Once installed, the licensee will maintain and operate the system. The capital cost estimate for installation of the bypass system (exclusive of modeling, prototypes, and testing) is $17.9 million at powerhouse No. 1 and $7.7 million at powerhouse No. 2 (both in 1986 dollars). (Section B.)

As an interim fish protection measure, the licensee will spill a specified percentage of the daily average flow in the spring, extending over eighty percent of the migration period. The percentage of water spilled in the spring will be reduced when the new hatchery specified in the agreement is completed. In addition, the licensee will conduct a summer spill evaluation in 1987 and will implement a summer spill program in 1988 if certain effectiveness criteria are met. If a bypass system is installed at both powerhouses, all spill will stop. If the Fishery Conservation Account specified in the agreement is established, then all subsequent spill must be purchased by the fishery agencies and Tribes using the credit made available through the account. (Section D.)

An annual credit known as the "Fisheries Conservation Account" will be established either at the request of the fishery agencies and Tribes or following installation of a bypass system at one but

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26/ We discuss this process further, infra, at pp. 10-11.

27/ A bypass system is a system for deflection, collection and routing of juvenile salmonids past operating powerhouse generating units.

not the other of the powerhouses, whichever occurs first. Upon establishment of the account, the licensee's obligation to fund and carry out the bypass research and development program under Section B of the agreement, and to provide spill, stops. All further bypass development studies and spill must be paid for out of the account. If no bypass systems are installed when the account is established, the annual account credit is $ 1,000,000 (1986 dollars). If a bypass system is installed at the second powerhouse only, the account credit is $600,000 (1986 dollars). The account will continue until either the agreement is modified or bypass systems are installed at both powerhouses. (Section C.)

The licensee will build a central hatchery facility and satellite facilities capable of rearing 250,000 pounds of salmon and 30,000 pounds of steelhead annually. The central facility will be located on the licensee's property adjacent to the east bank of Rocky Reach Dam and within the project boundary for Project No. 2145. The satellite facilities for outplanting the yearlings will be located on the Wenatchee, Methow, and Okanogan River systems. Subject to interim Commission approval, the hatchery design and construction will take place during 1987 and 1988. 28/ Consistent with the Supplement Agreement between the fishery agencies and Tribes, WDF and WDG will operate the hatchery facilities, and the licensee will pay the operation and maintenance expenses. The agreement also provides that hatchery compensation will be adjusted to reflect the results of project-related mortality studies, and also to account for increases in the run size in the future. (Section E.)

The licensee agrees to spend up to $650,000 (1986 dollars) to modify the existing adult fish ladders on the right and left banks at the Rock Island Project and to provide extra water if necessary to bring them into compliance with fishery agency operating criteria. 29/

The fishery agencies and the Tribes agree to support the expeditious issuance of a new 40-year license to the PUD for the Rock Island Project, incorporating the settlement agreement as a special article thereof. The fishery agencies and the Tribes agree to waive all claims to any additional measures or compensation from the date of the commencement of the mid-Columbia Proceeding (March 7, 1979) to the year 2000. The fishery agencies and the Tribes also agree not to seek or support any additional or different measures at Rock Island until the year 2000. In addition, the fishery agencies and the Tribes have stipulated that the

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28/ See 39 FERC ¶ 62,258 (1987).

29/ See 42 FERC ¶ 62,082 (1988).

performance of the licensee's obligations under the agreement will constitute compliance with the Northwest Power Planning Council's 1984 Fish and Wildlife Program, adequate fish protection, and full compensation for all losses caused by the project until the year 2000. 30/ The parties agree to the termination of the Mid-Columbia proceeding insofar as it pertains to the Rock Island Project. The fisheries agencies and the Tribes further agree to refrain from requesting any additional measures pertaining to fishery issues until the expiration of the thirteen-year initial period. (Section H.)

As discussed in more detail below, the staff determined in its final environmental impact statement (EIS) that the proposed settlement agreement would probably allow full compensation for present and future smolt mortality at the Rock Island Project. The settlement agreement will therefore resolve, with respect to the Rock Island Project, the issues set for hearing in 1979 as a result of the pleadings filed by the resource agencies in this docket and in Docket No. E-9569. 31/

Because of its connection to the relicensing of the project and the need to prepare an EIS thereon pursuant to the Yakima decision, this settlement agreement has undergone unusual public scrutiny since it was filed with the Commission on May 4, 1987. Not only is it the result of many years of discussions, studies, tests, hearings, and negotiations, but it has also been available in the public arena for thorough evaluation for nearly two

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30/ Section A.9 of the settlement agreement expressly supersedes certain anadromous fish measures which the licensee had proposed in the Exhibit S filed with the Commission on May 25, 1984. The anadromous fish measures which are not expressly superseded by the agreement and the resident fish and wildlife measures set forth in the Exhibit S continue to form a part of the fish and wildlife program which the licensee considers appropriate to support the relicensing of the project.

31/ Still to be resolved are fish passage issues at Project Nos. 2114, 2145, and 2149. Negotiations are continuing among the parties for long-term agreements at these projects, and meanwhile they operate under renewable annual stipulations approved by the presiding administrative law judge.

years. 32/ During this time, no problem or opposition to it has surfaced.

We believe the settlement agreement is in the public interest, and we will adopt it. It properly balances the continued operation of the project and its generation of low-cost electric power with a effective, long-term program for protection, mitigation, and enhancement of the fish and wildlife resources affected by the project. Together with staff's recommended mitigation measures for recreation, archeological, and historic resources, the settlement agreement appears to provide for an optimum utilization of the water resources of the Columbia River and project environs.

However, one aspect of the settlement does require clarification. As noted, Section A.6 of the agreement provides that, if the Rock Island Coordinating Committee cannot resolve a dispute among the signatories and if the amount in controversy is under $325,000, then any party may request the Commission to refer the dispute to the presiding administrative law judge in the mid-Columbia Proceeding, Docket No. E-9569, for expedited review. As we noted in the order approving a settlement agreement among many of these same parties with a similar dispute resolution mechanism, 33/ we have recently created a Division of Project Compliance and Administration within the Office of Hydropower Licensing in order to ensure prompt compliance with license terms and conditions. Under delegation of authority from the Commission, the Office and Division have authority to act on specified types of filings related to compliance matters. Therefore, whenever under Section A.6 of the agreement the signatories request the Commission to refer a dispute to the presiding judge in the mid-Columbia proceeding, the Commission will in most cases refer the dispute to this Division. However, the Commission will use its best efforts to resolve any dispute within the time frames set forth in the agreement. In appropriate circumstances, such as where there are material facts in dispute, we may refer a matter to an

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32/ In addition to its wide circulation for public review and comment as a part of the draft and final EIS in this proceeding, the settlement agreement was also subject to a public notice and comment proceeding before the Pacific Northwest Power Planning Council as part of the Council's process to amend the Columbia River Fish and Wildlife Program to incorporate the terms of the settlement therein. The Council held public hearings on the proposal in Washington, Oregon, Idaho and Montana in June and July, 1987, before amending the program and supporting the settlement agreement. See pages 6-7, 26 of this order.

33/ See footnote 7, supra.

administrative law judge. In either event, the initial staff decision is subject to de novo review by the Commission. 34/

We emphasize that any resolution by the Coordinating Committee, or a third party, pursuant to Section A.6 that contemplates a change in the license or in the operation of the project thereunder shall result in the filing of an appropriate application therefor by the licensee as soon as practicable after the dispute is resolved.

Finally, we note that, as with the Vernita Bar phase settlement approved on December 9, 1988, approval of this settlement does not affect the Commission's authority, as reserved in various articles of this license, to require, after notice and opportunity for hearing, alterations to project facilities or operations that may be warranted by changed circumstances. We intend any such reserved authority would be exercised only after full consideration of the benefit sought to be achieved thereby as balanced against the possibility that as a consequence the settlement could be voided, thereby eliminating the benefits obtained thereunder. If any party voids the agreement, the licensee shall, within 30 days, so inform the Commission in writing.

Environmental Impact Statement

On November 12, 1986, a notice of intent to prepare an environmental impact statement (EIS) was issued. Scoping meetings were held in Olympia and Wenatchee, Washington. Two scoping documents were prepared by the staff as part of the scoping process. The first was circulated to enable federal, state and local resource agencies and other interested parties to effectively participate in and contribute to the process. The second was prepared and released later to provide the public with a refined presentation and discussion of significant issues by the staff after the initial public and agency input. A draft EIS was circulated for comment in September 1987. All comments were carefully considered, and corrections and revisions were incorporated into the final EIS which was issued in July 1988.

The staff examined five alternative actions: (1) continued operation of the existing project, with supplemental hatchery releases of juvenile fish to partially compensate for mortality at

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34/ In order to keep our staff informed on compliance matters related to the settlement agreement, we are requiring that the licensee file a report within 30 days of any violation of, or compliance disputes under, the settlement agreement explaining the circumstances.

the dam; (2) various operating and design alternatives identified by the staff that would improve survival of juvenile and adult fish passing the dam, e.g., various daily spill regimes and installation of fish bypass screens (with a range of assumed guidance efficiencies); (3) fishery mitigation concepts embodied in the instant settlement agreement; (4) a no-action alternative consisting of either denial of a new license or issuance of a non-power license, which in either case would result in cessation of power production at the project; and (5) a coal-fired, steam-electric plant that would likely be required in the long term if the no-action alternative was implemented. The environmental impacts of each alternative were considered together with possible mitigation and enhancement efforts.

The significant environmental impacts of the project as originally proposed for relicensing by the PUD would include continued mortality to downstream migrants at present levels and replacing some of the wild stocks lost with a lesser number of hatchery-produced fish. The cost of project power to Puget would increase by about one percent above Puget's 1986 project power cost. Finally, the project would result in the unmitigated loss of about 145 acres of riparian and upland habitat plus 80 acres of orchard, a long-term net loss of terrestrial wildlife habitat ranging from a minimum of 145 acres to a maximum of 382 acres, and increased human disturbance and loss of habitat for the bald eagle. 35/

Implementation of the no-action alternative, which could involve either the denial of a new license for the project or the issuance of a non-power license, would mostly lead to the eventual development of another electrical power generating source, such as a coal-fired powerplant similar to that proposed for the Creston, Washington, site. Potential significant impacts of such a facility include using about 1,800 acres of land already dedicated to another use, consuming an annual average of 5.2 billion gallons of alluvial groundwater during operation, and temporary and localized increases in erosion-induced turbidity and sedimentation in local streams during construction. In addition, such a plant would consume about 132 million tons of coal during the operational life of the plant and release oxides of carbon, nitrogen and sulfur into the atmosphere as a result of coal combustion. There would be about 1500 acres of land disturbed for mining of coal and dedication of about 1,000 acres for fly ash disposal during the project's lifetime. There would also be visual impacts from cooling tower vapor plumes, from tall combustion stacks with visible emission plumes, and from the generally massive plant

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35/ See final EIS Sections 2.1, 3.1, 4.1, 4.4 and 5.1.1.

structures. Finally, there would be major socioeconomic impacts to any local community. 36/

The operating alternative evaluated was increasing spill over the dam at Rock Island. This could reduce mortality to downstream migrants below ten percent, but at least thirty percent of the available flow would have to be spilled instead of being used to generate. For this reason spill is expensive, but it does reduce losses to valuable wild stocks. This alternative would, because it leaves the existing project intact, result in the unmitigated loss of about 145 acres of riparian and upland habitat, 80 acres of orchard, a long-term net loss of terrestrial wildlife habitat on 145 to 382 acres, and increased human disturbance to, and loss of habitat for, the bald eagle. 37/

The structural alternative evaluated was use of bypass screens to divert downstream migrants away from turbine intakes, which is a widely accepted method for reducing mortality at hydropower projects. The staff concluded that bypass is the most effective mitigation measure available to protect migrants, and the protection is available throughout the migration season for all species at all river flows. In addition, bypass does not reduce generation. However, to date bypass has not been fully demonstrated to be technically feasible for Powerhouse No. 2 at Rock Island. Because this alternative would also leave the existing project intact, it would result in the same terrestrial impacts noted above in the discussion of spill. 38/

The final alternative evaluated is that contained in the settlement agreement. The settlement attempts to reduce losses to migrants at the dam, beginning with the most effective means first and utilizing less effective measures as secondary options (bypass if feasible, or spill if bypass infeasible). Actual total project mortality would be measured after losses of juvenile migrants have been reduced. Lost fish would be replaced in the manner least disruptive to the genetic integrity of existing wild stocks. The staff determined that the settlement agreement would effectively accomplish a 100 percent compensation for impacts to salmon and steelhead migrants. Under the twenty percent spring spill scenario, the commercial value of the Rock Island fishery could increase by $13 to $29 thousand and the sport value could increase by $18 to $63 thousand. Under the bypass system scenario (both

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36/ See final EIS Sections 2.2.1, 2.2.2, 3.2.1, 3.2.2, 4.2.1, 4.2.2, 4.4 and 5.1.2.1.

37/ See final EIS Section 2.2.3.3, 3.2.3, 4.2.3, 4.4 and 5.1.2.2.

38/ Id.

powerhouses), the commercial value of the Rock Island fishery could increase by $115 to $380 thousand and the sport value by $73 to $348 thousand. Finally, under the hatchery scenario, the commercial value of the Rock Island fishery could increase by $716 to $748 thousand and the sport fishery by $339 to $531 thousand. The staff estimated that the settlement agreement would increase the project power cost to Puget by 9 to 16 percent above the utility's 1986 cost, depending on the fish mitigation and compensation scenario assumed. This alternative would have the same terrestrial impacts as those above that left the existing project intact. 39/

The final EIS recommends relicensing the Rock Island Project with implementation of the fish mitigation measures specified in the settlement agreement. The staff's analyses strongly indicate that the PUD's initial proposal for project operation and fishery mitigation under relicensing would, through proposed hatchery releases without any measures to reduce losses at the dam, continue to contribute to declines (and possible extinction) of important and irreplaceable wild stocks of salmon and steelhead. Additionally, the proposed hatchery compensation plan would not mitigate mortality at the project and would not be consistent with the massive regional effort to protect and enhance the anadromous fishery in the Columbia River Basin. The PUD's initially proposed project operation and fishery mitigation plan would not meet the stipulations and goals of the Council's most recent Fish and Wildlife Program, which guides regional fishery planning efforts through coordinated planning input by all fishery management agencies.

The staff's quantitative evaluation of various fishery mitigation strategies strongly indicates that substantial increases in fish survival could probably be achieved at the Rock Island Project. Implementation of mechanical fish bypass facilities and/or increased project spills during periods of the year when migrants pass the dam (spring and summer) could conceivably and realistically reduce mortality by several percentage points.

Some questions exist regarding the technical feasibility of bypass screens at Rock Island in terms of the level of effectiveness that they could achieve at the second powerhouse. The staff's modeling of bypass and spill as alternatives, however, suggests (assuming that certain bypass efficiencies could be achieved) that substantial reductions in losses could be realized at the Rock Island Project. Additional compensation could be achieved with hatchery releases up to levels equal to the

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39/ See final EIS Sections 2.2.3.4, 3.2.3, 4.2.3, 4.4, and 5.1.2.2.

difference between the numbers of fish that could be saved through reduced mortality associated with bypass and spill and the total number of fish killed at the project.

The settlement agreement defines a two-phased hatchery compensation program that would establish and guide production and release of juvenile fish to avoid or minimize adverse impacts to wild stocks and adjust hatchery compensation based on measured project mortalities (to be determined as part of the second phase). Hatchery releases under this carefully guided program, and with the benefit of additional studies to minimize effects of additional hatchery releases, would be less likely to threaten populations of existing wild stocks of anadromous fish.

As noted above, the staff evaluated the settlement agreement as a design and operating alternative. The staff concluded that the mitigation concept in the settlement agreement is fully consistent with the results and conclusions of the staff's quantitative analysis of various individual mitigation strategies. The concept, which includes installation of fish bypass facilities and/or implementation of spring and possibly summer spill, with hatchery releases of juveniles (pursuant to results of genetics and outplanting studies) to make up the rest of the loss not mitigated by bypass or spill, would probably allow full compensation for present and future mortality at the Rock Island Project.

The staff also agrees with the necessity of conducting additional studies, as specified in the settlement agreement, regarding juvenile mortality at the project and the feasibility and effectiveness of specific mechanical bypass systems for the project. The reasons include the existing level of uncertainty concerning fish mortality and bypass effectiveness, the cost of such mitigation, and the potential environmental consequences of ineffective mitigation. Hence, the staff believes that additional studies, as proposed in the settlement agreement, are fully justified and necessary.

The staff's fishery and economic analyses set forth in the final EIS indicate that very substantial increases in the total numbers of juvenile migrants passing the Rock Island Project could be achieved by implementing the provisions of the settlement agreement, and that this increased survival would (assuming implementation of fishery mitigation plans for other mainstem dams) result in increases to the commercial and sport value of the Columbia River salmon and steelhead fishery. This benefit would accrue at the expense of an increased cost of power delivered to Puget, which purchases the majority of electricity produced by the Rock Island Project.

While increases in the cost of power are considered significant by the staff, they must be weighed against the benefits of increased valuation of the Columbia River commercial and sport fishery. Given the present depressed state of most of the Columbia River anadromous fish stocks and the goal of the Council to double the size of the present anadromous fishery, the staff believes that the fishery benefits that would accrue as a result of operation under stipulations of the settlement agreement (in concert with other planned improvements in fish passage facilities at downstream dams) justify the increased capital and operating costs of the specific improvements required to produce the benefits.

The staff concluded in the final EIS that wildlife mitigation implemented to date or planned would not fully compensate for habitat lost as a result of inundation related to operation of the second powerhouse. This conclusion is based in part on the staff's belief that effectiveness of the wildlife mitigation proposed for the Wenatchee River recreational sites would be substantially and negatively affected by the recreational development planned by the licensee for the same areas. The staff indicated in Section 4.1.4.2 of the final EIS that the best mitigation, solely from the wildlife perspective, for in-kind compensation of the lost habitat would be to devote the Wenatchee River confluence recreational sites to wildlife mitigation only, i.e., that no recreational development take place at either the north or south confluence sites. This conclusion is based principally on the premise that the most desirable mitigation is in-kind replacement of habitat within the general area where it was lost. The staff believes, however, that both wildlife mitigation and recreational development are important in the area and that both can be achieved.

During the scoping process for the EIS, federal, state, and local recreational interests in the state of Washington urged the Commission to refrain from recommendations or action that would alter the existing recreational plans previously authorized by the Commission. In view of this public interest, but also in consideration of the staff's mitigation conclusions above, the staff recommended that, in lieu of foregoing development of the Wenatchee River recreational sites for wildlife mitigation as was suggested in Section 4.1.4.2., the licensee develop offsite lands for the purpose of compensation of lost habitat and as general wildlife enhancement.

Specifically, the staff recommended that, for the life of the new Rock Island license, the licensee maintain and enhance as wildlife habitat the approximately 1,000 acres of land (the so-called Water District lands owned by the PUD) identified under the Wildlife Habitat Mitigation subsection of Section 4.1.4.2 as the third alterative. Because this land is already under the ownership

of the PUD, there would be no significant cost to the PUD's county rate payers or major outside power purchasers. Additionally, maintenance of the land as wildlife habitat would be consistent with present use of the land as a water supply area for the PUD's water district.

In summary, the staff concluded in the final EIS that relicensing the Rock Island Project with the fishery mitigation identified in the settlement agreement and with the wildlife mitigation discussed above would provide a continued source of economical, safe, and reliable electric power for the region, with a high probability of fully mitigating existing and future fish losses at the dam and replacement of lost wildlife habitat. The mitigation concepts in the settlement agreement are based upon proven strategies. Based upon the staff's modeling studies, recommendation of these strategies in the settlement agreement is consistent with the staff's conclusions regarding their probable effectiveness (given certain assumptions) if implemented at the Rock Island Project.

We have reviewed the final EIS and concur with its recommendations. We believe that the document complies with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality's implementing regulations, and our own regulations under NEPA. 40/ Based on the record in this proceeding, including the final EIS, we are including in the new license conditions that will implement staff's recommendations in the final EIS. For fisheries matters these include, among other things: (1) notifying the Commission's Office of Hydropower Licensing (OHL) and the Portland Regional Office (PRO) of all meetings of the Rock Island Coordinating Committee, (2) filing an annual report outlining accomplishments of the previous year and a schedule of goals for the coming year, (3) filing the results of all studies and tests with the Commission, (4) filing for Commission approval functional design drawings of any juvenile fish bypass systems, any fish hatcheries or satellite facilities, and any fish ladders that may result from implementation of the settlement agreement, and (5) filing as-built drawings with the Commission within six months after construction or modification of any bypass systems, hatcheries, or fish ladders.

With respect to wildlife concerns, the license requires the preparation of a wildlife management plan that should (1) identify all enhancement opportunities for areas under consideration for wildlife mitigation or enhancement, (2) describe in detail site-specific mitigation or enhancement measures to provide maximum replacement of riparian wildlife habitats, and (3) outline

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40/ 18 C.F.R. Part 380 (1988).

mitigation/enhancement goals and specific plans for any studies or monitoring programs needed to achieve these goals.

In order to ensure that there is no impact to the bald eagle -- a federally listed threatened species -- the license requires that (1) heavy construction activities at certain sites be limited from December 1 to March 1, (2) shoreline hiking trails be placed a significant distance from eagle perch trees, and (3) large trees and snags along the perimeter of the reservoir not be removed. The license also requires the preparation and implementation of a plan to monitor the effect on the bald eagle of recreational use of project lands and waters.

The license also contains conditions to mitigate other project impacts which, although not expected to be significant, are nevertheless important. Project operation results in mortality to Canada goose goslings that are swept over the spillway. Increased spill in May could increase gosling mortality. 41/ The licensee will be required to monitor this population to quantify the degree of mortality. Based on the results of the study, the licensee must develop appropriate mitigative measures, such as enhancing upstream nesting habitat. The licensee has proposed to install 60 wood duck nest structures. In order to ensure that they serve their intended purposes, the license requires a study to evaluate the effectiveness of the program and a plan to implement measures to improve wood duck production in the project area.

Recreational development and project maintenance activities could affect rare plant species if they exist in the project area. The license requires a survey to be conducted and the results to be filed within six months from the date of issuance of this order. Any area that would likely be affected by recreational development and use and by project maintenance activities, such as transmission right-of-way management, must be surveyed.

Finally, although no significant impacts to cultural resources are expected from relicensing, continued project operation could affect archeological sites listed in or eligible for inclusion in the National Register of Historic Places. 42/ The PUD has prepared a draft cultural resources management plan to avoid or mitigate impacts to the sites. The plan has been reviewed by the Washington State Historic Preservation Officer (SHPO) and the Colville Tribes. The license requires the plan to be completed after further consultation with the SHPO, the Colville Tribes, and the Advisory Council on Historic Preservation (ACHP). The PUD must also file a

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41/ See final EIS at pages 4-14 to 4-16.

42/ See final EIS Section 4.1.8.

report containing the results of investigations identified in the plan, any necessary revisions to the plan, and copies of letters from the SHPO, ACHP, and Colville Tribes accepting the report. The project also has the potential to affect archeological and historic sites not previously identified. Events associated with continued operation, such as erosion along the reservoir shoreline, have the potential to uncover buried sites. The license requires the implementation of measures to avoid or minimize impacts to any such sites.

Pacific Northwest Power Planning and Conservation Act

Under Section 4(h) of the Pacific Northwest Power Planning and Conservation Act (PNPPCA), the Northwest Power Planning Council (Council) developed the Columbia River Basin Fish and Wildlife Program (Program) to protect, mitigate and enhance fish and wildlife resources associated with the development and operation of hydroelectric projects within the Columbia River Basin. Section 4(h) further states that appropriate agencies shall take into account, to the fullest extent practicable, the Program adopted under the PNPPCA. 43/

As noted previously, in August 1987, the Council adopted amendments to the Program that incorporate the settlement agreement. The license is therefore in compliance with the Program. Further, we are reserving the authority in this license to require future alterations in project structures and operation in order to take into account, to the fullest extent practicable, the applicable provisions of the Program.

Comprehensive Plans

Section 10(a)(2) of the FPA 44/ requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. The Commission has provided an interpretation of comprehensive plans under Section 10(a)(2). 45/ We reviewed five comprehensive plans

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43/ See notes 22 and 23, supra.

44/ 16 U.S.C. § 803(a)(2) (1986).

45/ Order No. 481-A, 53 Fed. Reg. 15,802 (May 4, 1988), III FERC Stats. & Regs. ¶ 30,811 (1988).

that address various aspects of waterway management in relation to the proposed project. 46/ No conflicts were found.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the FPA 47/ requires the Commission to include license conditions based on recommendations of federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife. In the final EIS for the Rock Island Project, the staff addresses the concerns of the federal and state fish and wildlife agencies and makes recommendations consistent with those of the agencies. By virtue of our approval of the settlement agreement herein, with which all the relevant fish and wildlife agencies have concurred, and our adoption of license articles that implement the recommendations in the final EIS, we conclude that there are no unresolved fish and wildlife issues remaining in this proceeding.

Consumption Efficiency Improvement Program

Section 10(a)(2)(C) of the FPA 48/ requires that the Commission, in considering license applications submitted by an applicant primarily engaged in the generation or sale of electric power, consider the electricity consumption efficiency improvement programs of the applicant, including its plans, performance, and capabilities for encouraging or assisting its customers to conserve

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46/ Northwest Conservation and Electric Power Plan, 1986, Columbia River Basin Fish and Wildlife Program, 1987, as amended, Northwest Power Planning Council; Columbia River Fish Management Plan, 1987, State of Washington, State of Oregon, State of Idaho, Confederated Tribes of the Warm Springs Reservation, Confederated Tribes of the Umatilla Indian Reservation, Nez Perce Tribe, and Confederated Tribes and Bands of the Yakima Indian Nation; Final environmental impact statement and fishery management plan for commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California commencing in 1978, March 1978, Department of Commerce; Eighth amendment to the fishery management plan for commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California commencing in 1978, January 1988, Pacific Fishery Management Council; Hood Canal salmon management plan, October 1985, Washington Department for Fisheries, Point No Point Treaty Council, U.S. Fish and Wildlife Service.

47/ 16 U.S.C. § 803(j) (1986).

48/ 16 U.S.C. § 803(a)(2)(C) (1986).

electricity costs effectively, taking into account the published policies, restrictions, and requirements of relevant state regulatory authorities applicable to the applicant. Since the PUD is primarily engaged in the generation and sale of electric power, this application comes under the scope of Section 10(a)(2)(C).

The PUD is not subject to any regulatory authority requiring adherence to defined conservation or load management programs. The PUD's efforts to promote energy conservation programs and energy use efficiency have been voluntary and are of long standing. As early as the mid-1950's, the PUD initiated programs to inform its consumers about the most efficient and economic use of electric heating and air conditioning, home and business conservation measures, and new electrical products and their use. As early as the 1960's the PUD sponsored the Gold Medallion Home Program, which established residential standards for insulation in Chelan County.

In 1980, the PUD offered its customers a more sophisticated energy analysis program that helped the PUD qualify for various federal programs, comply with new federal standards, and meet the newly emerging interest in conservation programs. The PUD's ongoing and planned activities to promote energy use efficiency improvement include programs to improve hot water heating efficiency, help consumers improve the efficiency of electricity use in the home, initiate home energy loan programs, facilitate low-income weatherization, and disseminate energy information to consumers in the residential and commercial sectors. The PUD also participated in BPA's Short-term Energy Buy Back and the Super Good Cents programs, completed programs to meet federal guidelines for Commercial and Apartment Conservation Services, and initiated an energy and demand reduction program in the tree-fruit cold storage industry. Finally, the PUD initiated programs to improve the generation, distribution, and efficiency of street lighting on the PUD system.

In light of these facts, the Commission concludes that Chelan has made and is continuing to make a good-faith effort to reduce the consumption of electricity on its power system.

Section 15(a) of the Federal Power Act

Section 15(a) of the FPA 49/ requires the Commission to consider in writing a number of factors in acting on applications for new license following the expiration of existing licenses.

1. The plans and abilities of the applicant to comply with the articles, terms, and conditions of any license issued to

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49/ 16 U.S.C. 808(a) (1986).

it and with other provisions of Part I of the Act (Section 15(a)(2)(A))

We have reviewed the license application and the PUD's past record of compliance with the existing license to determine the PUD's ability to comply with the articles, terms, and conditions of any license issued to it and with other applicable provisions to this part of the FPA. The PUD has satisfactorily complied with the terms and conditions of the existing license since it was issued, and we believe that the PUD would be able to satisfy fully the conditions of this new license.

2. The plans of the applicant to manage, operate, and maintain the project safely (Section 15(a)(2)(B))

We have reviewed the PUD's plans to manage, operate and maintain the project safely. The PUD proposes no change in project operation that would adversely affect project safety. Based on review of the specific information provided by the PUD on the aspects of the project that affect public safety and on a review of project records, we conclude that the PUD's plans are adequate.

Pursuant to Part 12 of our regulations, on May 11, 1983, the PUD filed an emergency action plan (EAP), which was approved on June 2, 1983, has submitted the required independent-consultant safety inspection reports, and has complied with the recommendations from its consultants and from our Regional Office.

The PUD has shown a regard for public safety by installing boating safety barriers at the reservoir, placing fencing around transformers, water control facilities, and other potentially dangerous equipment, and notifying the public of potentially hazardous conditions that may result from the operations of the hydroelectric facilities.

No fatalities have been experienced at the project, and the last employee lost-time accident occurred in 1986.

Based on the PUD's safety-compliance record, we conclude that the PUD can be expected to cooperate with the Commission's requests and to comply fully with the terms and conditions of any new license issued for the project.

3. The plans and abilities of the applicant to operate and maintain the project in a manner most likely to provide efficient and reliable electric service (Section 15(a)(2)(C))

A review of the PUD's past operation record shows that the project has been and is being operated in an efficient and reliable manner.

In accordance with the Pacific Northwest Coordination Agreement and the Mid-Columbia Hourly Coordination Agreement, the project is operated in coordination with the other projects in the Columbia River Basin to maximize the economic utilization of the water power resource.

Whenever possible, the PUD has modernized the project to increase project capacity, efficiency, and reliability. The original project included four generating units. Six additional units were installed in 1951; in 1979, the addition of a new powerhouse containing eight bulb-turbine units was completed. Over the period of license, the PUD has upgraded and replaced worn and damaged equipment when necessary to ensure reliable project operation.

We conclude that if the PUD were to receive a new license, it would continue to operate the project in an efficient and reliable manner.

4. The need of the applicant, over the short and long terms, for the electricity generated by the project to serve its customers (Section 15(a)(2)(D)) 50/

Power from the Rock Island Project is an integral part of the PUD's short- and long-term plans to serve the needs of its customers at the lowest reasonable cost. In planning hydroelectric resource acquisition and development, the PUD designed hydroelectric projects to make full use of available water resources at the project sites and to capture economies of scale in pursuing comprehensive development of a site. As a result, the PUD has developed resources to provide service to its local retail customers and to sell power at wholesale to a number of regional utilities.

The PUD established regional markets for its project power through the negotiation of long-term contracts with utilities in the northwest. A substantial portion of the electricity generated by the Rock Island Project is sold by the PUD at wholesale to the Puget Sound Power and Light Company (Puget) under a long-term power sales contract. By the terms of the contract, the PUD is entitled to annually increasing withdrawals of capacity from the first Rock Island powerhouse until the total withdrawal reaches 50 percent of the total capacity on July 1, 1999. After that time, the withdrawal remains at 50 percent until the contract expires in 2012. Beginning on July 1, 2000, the PUD will also have a contractual right to exercise an option for annually increasing

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50/ See also Section 1.2 of the final EIS.

withdrawals from the second project powerhouse up to a maximum of 50 percent.

The PUD's other sources of power include similar withdrawal arrangements for the Rocky Reach Project No. 2145 51/ and the Lake Chelan Project No. 637, 52/ and a one-percent share in the Columbia Storage Power Exchange (CSPE). The CSPE contract provides an annually diminishing amount of capacity and energy that is to terminate in 2003. Under the terms of the Columbia River Treaty, the PUD is required to return one half of the benefits from upstream storage development to Canada. This Canadian entitlement allocation decreases until 1995 and then increases as additional upstream projects are compensated under terms of the treaty. Because of the large electrical heating component of the PUD's load, winter loads can not be served entirely from the PUD's share of its resources.

The generation at the PUD's project is governed by water released from upstream federal storage dams. These winter water releases are not sufficient to supply the PUD's high winter electric requirements, and the PUD's net remaining capacity and energy requirements are met by power purchases from BPA and by the PUD's conservation programs. Such purchases are projected to be required by the PUD through 2012. The PUD considers projections of power purchases beyond 2012 to be beyond a reasonable horizon of certainty, and we concur with that assessment.

Puget is an investor-owned utility that depends heavily on Rock Island power output. The project contributes about 14 percent of Puget's available peak resources and about 32 percent of the total hydroelectric production used to meet Puget's load requirements. Both capacity and energy deficits are projected to occur on Puget's system as early as the 1988-1989 operating year. Should the PUD not receive a new license for the project, winter energy deficits on the PUD system and both capacity and energy deficits on the Puget system will be increased by the loss of the project power. The cost of alternative sources of power to replace the relatively low cost of project power would be higher for both the PUD and for Puget. The customers of both would be adversely affected by loss of the project output.

Additional conservation and load management measures, beyond those already considered in the respective forecasts, were determined by both systems to be inadequate as replacement for project power on both quality and cost bases. Purchased power is

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51/ 18 F.P.C. 25 (1957).

52/ 15 FERC ¶ 62,168 (1981).

considered to be the most likely alternative to be pursued by both the PUD and Puget in both the short and long terms. Because the region is expected to have a resource deficit again sometime in the mid- to late-1990's, power purchases from BPA are also considered to be less than comparable to project power, BPA contracts being subject to cutoff on essentially 5 years' notice. Even though alternative cost analyses assume power available for a number of years at a cost equal to BPA's forecast of its new resource rate, the PUD sees no assurance of such availability and does not consider such purchases as a suitable substitute for project power. The PUD estimates that the additional costs to its retail customers associated with purchases of BPA power in lieu of Rock Island power would be about $240 per customer per year in 1988, and $464 per customer per year in 2011.

We conclude that the PUD has a need for the project power in the short and long term, and that the loss of project power and the subsequent transfer of the PUD's and Puget's load requirements to BPA would increase BPA's load requirements and costs and would contribute to increasing rates for BPA customers, in addition to increasing the costs for the PUD's and Puget's customers.

5. The applicant's existing and planned transmission services (Section 15(A)(2)(E))

The two project powerhouses are electrically connected with an interconnected transmission system through six 115-kV transmission lines that join the McKenzie-Valhalla substation 115-kV buses. If a new license is issued to the PUD or to another utility, no changes are likely in the transmission services provided by the transmission facilities. In either case, the transmission lines could be used to deliver power to the PUD's customers or to wheel project power to other areas. If the PUD is not issued a new license and a new licensee chooses to wheel power over the federal system from the Valhalla substation, the PUD's unlicensed transmission from Valhalla would have to undergo minimal changes to accommodate transmission from other power sources owned by the PUD.

Issuance of a nonpower license would require major modification of the PUD and adjacent utility transmission facilities. Major problems, arising from limited transformation capacity of the area's 115-kV transmission network, would follow from the absence of all project power. With project power unavailable, an outage of either substation transformer stepdown capacity or of certain 115-kV transmission lines would produce unacceptable overloading of remaining facilities, and would violate established reliability criteria. In addition to the unacceptable reliability problems, losses and voltage drops would increase and would require additional modification of the transmission service. Transmission modification that might be required in the absence of project power would include an expenditure of $3 million to

transfer load to the 230-kV network by changing transformation at the Valhalla substation from 115 kV to 230 kV and an expenditure of $3 million to add 230-kV transmission and transformer stepdown facilities to serve the PUD load centers.

6. Whether the plans of the applicant will be achieved, to the greatest extent possible, in a cost-effective manner (Section 15(a)(2)(F))

Other than the project facilities identified in the settlement agreement, the PUD plans no significant modifications to the project. As noted above, the final EIS concluded, and we agree, that relicensing the project in accordance with the settlement agreement was the preferred alternative based on environmental and economic considerations. We conclude that the project, as constructed and with the modifications to project structures and operations discussed herein, adequately develops the hydropower potential of the site and represents a very economical use of a renewable resource.

Safety of Project Structures

The project is safe against sliding and overturning at normal maximum headwater elevation 614.1 feet, normal tailwater elevation of 571.6 feet (U.S.G.S. datum), plus earthquake loading of 0.1g, and with a flood headwater elevation of 619.5 feet and tailwater elevation of 606.2 feet. For both cases the structures were found to be safe against sliding and overturning.

The largest flood of record at Rock Island was 800,000 cfs in 1894, but the Corps of Engineers estimates that, with regulation from the upstream storage projects, the same flood would now have a peak discharge of 464,000 cubic feet per second (cfs). With Rock Island Reservoir at flood elevation 619.5, the spillway is capable of discharging 960,000 cfs. At this flow, the tailwater surface would be about elevation 606 feet.

The probable maximum flood (PMF) at Chief Joseph Dam with upstream regulation is estimated by the Corps of Engineers to be 1,200,000 cfs. In proportion to the size of the drainage areas, the regulated PMF at Rock Island would be 1,425,000 cfs. At this flow, the Rock Island Reservoir would surcharge to about elevation 632 feet and the tailwater would be at elevation 623 feet. The differential between headwater and tailwater would be about 13.5 feet when discharging the spillway design flood of 960,000 cfs, and about 9.0 feet when discharging 1,425,000. In view of the comparatively small head differential and the insignificant amount of storage that would be released, there would be slight additional hazard to downstream areas in the event of failure of the dam during the occurrence of the PMF.

The Corps of Engineers, in its letter to the licensee dated October 13, 1971, concluded that the spillway capacity is well within acceptable limits for passing major floods, considering the relatively small differential in headwater and tailwater at the project. We conclude that the spillway is adequate.

The Board of Consultants, formed to monitor the construction of the second Rock Island powerhouse, met from May 13 to 15, 1980, for the final review of the engineering and construction of the project. In its final report, the Board recommended that the licensee continue the structural monitoring plan, which provides for monitoring of dam alignment and settlement, uplift, relief drains both for flows and pressures, post-tensioned anchors, and for regular inspection of the "loose bolting" attachment of the trash racks. Article 301 requires the licensee to continue the structural monitoring plan.

The latest safety inspection report filed by the independent consultant for the licensee, under Part 12 of the Commission's regulations, stated that the project appears to be in a safe and stable condition. The report noted a small amount of displacement of the north abutment structure, and some siltation of the drains in Powerhouse Number 2. The report recommended that the licensee institute a program for monitoring the displacement of the north abutment structure, and recommended cleaning and monitoring the flow from the foundation drains in Powerhouse Number 2. The licensee submitted it plans for implementing the consultant's recommendations on April 27, 1987. The Commission's Regional Office accepted the plans and indicates that the licensee is making satisfactory progress in implementing them.

The project has been well maintained and is safe and adequate for continued operation.

Comprehensive Development

The project has a total installed capacity of 622.5 MW, 53/ with a hydraulic capacity of 220,000 cfs, which is the hydraulic capacity of the Rocky Reach plant located immediately upstream from the Rock Island Project on the Columbia River. The power production of Rock Island depends to a great extent upon the discharge from the upstream plants, since its limited storage capacity is sufficient for pondage regulation only and is not adequate for flood control or regulation of flows from upstream

53/ The project, with its average annual generation of 2,780 million kWh, will utilize a renewable resource that will save the equivalent of approximately 4,565,000 barrels of oil or 1,287,000 tons of coal per year.

projects. With the exception of the undeveloped river below Priest Rapids Dam, the entire reach of the Columbia River has been developed for hydroelectric power.

The Columbia River is a navigable waterway. At the present time there is no commercial navigation and no navigational facilities in the vicinity of this reach of the Columbia River. However, an investigation was conducted by hydraulic model test, in coordination with the Seattle District, Corps of Engineers, and the results demonstrated that the potential installation of navigation, locks is compatible with the Rock Island Project. Standard license article 12 reserves authority to the United States to use water in such amount as may be necessary for the purposes of navigation, should the installation of such locks be undertaken by the United States.

There are irrigation facilities utilizing waters from the Rock Island reservoir. The operation of the project has no adverse effect on these installations.

The PUD, as a member of the Western Systems Coordinating Council, the Pacific Northwest Public Power Council, the Northwest Power Pool, and the Pacific Northwest Utilities Conference Committee, is involved in the study and analysis of long-range projection of power loads, generating needs, and means by which those needs can be met through additional facilities.

Based upon a review of agency and public comments filed in this proceeding and on the staff's independent analysis, the Rock Island Project is best adapted to a comprehensive plan for the Columbia River.

License Term

A license will be issued for a period of forty years. Such a term reflects the significant investment in the original license near the end of that license term for a new powerhouse and increased capacity of 212.1 MW. This is consistent with our policy on this issue. 54/

Revised Exhibits

The licensee filed on October 18, 1976, revised Exhibits J and K pursuant to Article 68 of Amendment 17 to the license to show the project boundary around the second powerhouse. Also, the Commission issued on October 19, 1979, an order approving

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54/ See, e.g., Montana Power Company, 56 F.P.C. 2008 at 2012 (1976).

Exhibit R, 55/ and issued on July 17, 1980, an order amending license for the Rock Island Project. 56/ Article 302 herein requires the licensee to file a revised Exhibit G to supersede the Exhibits J and K filed October 18, 1976, and to reflect any changes in the project as a result of the orders referenced above.

The Commission orders:

(A) This license is issued to Public Utility District No. 1 of Chelan County, Washington, for a period of 40 years, effective the first day of the month in which this order is issued, to continue to operate and maintain the Rock Island Project No. 943, located in Chelan and Douglas Counties, Washington, on the Columbia River, a navigable waterway of the United States, and occupying lands of the United States under the administration of the U.S. Bureau of Land Management. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as a part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The Rock Island Project No. 943 consists of:

(1) All lands, to the extent of the licensee's interests in those lands, constituting the project area and enclosed by the project boundary. The project area and boundary are shown and described by certain exhibits that form part of the application for license and that are designated and described as:

Exhibit	FERC No. 943-	Showing
J	225	General Map-Project Area
K-1 to K-25	132 through 156	Detail Map-Project Area
K-S1 to K-S9	157 through 165	Survey Data-Project Area
K-T1	266	Detail Map-Transmission Lines

(2) Project works consisting of:

(a) a concrete gravity dam, about 3,580 feet long, with a gated spillway section 1,184 long containing 31 crest gates; (b) a reservoir extending about 20 miles upstream having a normal maximum forebay elevation 614.1 feet U.S.G.S. and a gross storage capacity of 130,000 acre-feet and a usable storage capacity of 11,000 acre-feet at a maximum reservoir drawdown of 4 feet for power operations; (c) a concrete powerhouse about 870 feet long, integral

55/ 9 FERC ¶ 62,003 (1979).

56/ 12 FERC ¶ 62,062 (1980).

with the dam, containing one 15,000-kW generating unit, three 20,700-kW generating units, and six 22,500-kW generating units (10 units totaling 212.1 MW); (d) a step-up substation on the powerhouse roof; (e) a high-tension switching station on Rock Island; (f) four single-circuit 115-kV transmission lines extending from the switching station for a distance of about two miles to the McKenzie switchyard; (g) a second project powerhouse at the right bank about 465 feet long and 200 feet wide, containing eight 51.3 MW horizontal shaft, bulb-turbine type generation units (8 units totaling 410.4 MW); (h) step-up transformers at the second powerhouse connected to two single-circuit 115-kV transmission lines extending about two miles to the McKenzie-Valhalla substation; (i) three fishways and related fish facilities; and (j) appurtenant facilities.

The location, nature and character of these project works are generally shown and described by the exhibits cited above and more specifically shown and described by certain other exhibits that also form a part of the application for license and that are described and designated as:

Exhibit L	FERC No. 943-	Titled
1	185	General Plan
2	186	Left Abutment Plan
3	187	First Powerhouse Plan
4	188	First Powerhouse Sections
5	189	First Powerhouse Main One Line Diagram
6	190	Spillway Dam
7	191	Second Powerhouse Plan
8	192	Second Powerhouse Section
9	193	Second Powerhouse Main One Line Diagram
10	194	Right Abutment Plan
13	197	Middle Fishway Sheet 1 of 2
14	198	Middle Fishway Sheet 2 of 2 57/

Exhibit M - "General Description of Equipment," consisting of eleven typed pages filed on May 29, 1980, as part of the application for new license.

57/ By orders issued February 2, 1988, 42 FERC ¶ 62,082, and December 16, 1988, 45 FERC ¶ 62,229, the Director approved modifications to the left bank and right bank fishways and required that as-built drawings be filed within 90 days after construction of the modifications.

Exhibit R - "Recreation Plan for Rock Island Project," consisting of 35 pages of text and 7 drawings (FERC Nos. 943-216 and -217, and -219 through -223) filed March 1, 1978, and approved October 19, 1979.

(3) All of the structures, fixtures, equipment, or facilities used of useful in the operation or maintenance of the project and located within the project boundary, all portable property that may be employed in connection with the project, located within or outside the project boundary, as approved by the Commission, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) Exhibits J, L, M, and R designated in ordering paragraph (B) above are approved and made a part of the license. Exhibit K is approved to the extent that it shows the general location and nature of the project.

(D) The application for approval of Exhibits J and K filed on October 18, 1976, is dismissed.

(E) This license is also subject to the terms and conditions set forth in Form L-5 (revised October, 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters and Lands of the United States," attached to and made part of this license. The license is also subject to the following additional articles:

Article 201. The licensee shall pay the United States the following annual charges, effective the first day of the month in which this license is issued:

(a) For the purpose of reimbursing the United States for the cost of administration of Part I of the FPA, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 830,000 horsepower.

(b) For the purpose of recompensing the United States for the use, occupancy, and enjoyment of its lands other than for transmission line right-of-way, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The acreage of those lands is tentatively set at 33.53 acres. The Commission reserves the right to adjust this figure at a later date.

(c) For the purpose of recompensing the United States for the use, occupancy, and enjoyment of 0.07 acre of its

lands for transmission line right-of-way, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time.

Article 301. The licensee shall carry out the recommendations for testing and monitoring of the project structures and equipment as set forth in the final report by the Board of Consultants dated May 15, 1980.

Article 302. Within one year from the date of issuance of this order, the licensee shall file for approval revised Exhibit G conforming to the Commission's regulations showing the Rock Island Project No. 943 as constructed.

Article 401. The licensee shall implement the fisheries protection measures outlined in the Sections B through F of the settlement agreement filed with the Commission on May 4, 1987, according to the schedule outlined in the agreement. Further, the licensee shall do the following: (1) notify the Commission's Office of Hydropower Licensing and Portland Regional Office of all meetings of the Rock Island Coordinating Committee; (2) file an annual report not later than January 31 of each year outlining accomplishments of the previous calendar year and a schedule of projected accomplishments for the next year; and (3) file results of all studies and testing with the Commission.

Article 402. The licensee, after consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Departments of Fisheries and Wildlife, Oregon Department of Fish and Wildlife, Confederated Tribes and Bands of the Yakima Indian Nation, Confederated Tribes of the Colville Reservation, and Confederated Tribes of the Umatilla Indian Reservation, shall develop functional design drawings of any juvenile fish bypass systems, fish hatcheries or satellite facilities, or fish ladder modifications that may result from implementation of the settlement agreement filed with the Commission on May 4, 1987. The licensee shall file the design drawings for Commission approval at least 90 days prior to the start of construction or modification of any bypass systems, hatcheries, or fish ladders. The Commission reserves the right to require modifications to the functional design drawings. The licensee shall not start construction of the fish protection facilities until the drawings are approved by the Commission. The licensee shall file as-built drawings with the Commission within 6 months after completion of construction or modification of any bypass systems, hatcheries, or fish ladders.

Article 403. The licensee, after consultation with the U.S. Fish and Wildlife Service and the Washington Department of Wildlife, and within 1 year from the date of issuance of this license, shall file for Commission approval a wildlife management

plan for the 1,000-acre Water District Lands located west of the city of Wenatchee. The plan shall include: (1) the location of all enhancement opportunities for areas under consideration for mitigation or enhancement; (2) a detailed description of site-specific mitigation or enhancement measures to provide maximum replacement of riparian wildlife habitats; (3) an outline of mitigation/enhancement goals and specific plans for any studies or monitoring programs needed to achieve these goals; (4) an implementation schedule; and (5) provisions for monitoring the success of the mitigative and enhancement measures. Agency comments shall be included with the filing. The Commission reserves the right to require modifications to the plan.

Article 404. The licensee, in order to protect bald eagles at the project, shall: (1) restrict heavy construction (earth-moving, ditching, pile-driving, etc.) at the Wenatchee River Confluence recreational sites from December 1 to March 1; (2) relocate the shoreline hiking trails at the Wenatchee River south bank site a significant distance from eagle perch trees; and (3) avoid the removal of large trees and snags along the perimeter of the reservoir. Within 1 year from the date of issuance of this license, the licensee, after consultation with the U.S. Fish and Wildlife Service, Washington Department of Wildlife, National Park Service, Washington Parks and Recreation Commission, and Washington Interagency Committee on Outdoor Recreation, shall file for Commission approval design drawings of the relocated hiking trails and agency comments of the drawings. The Commission reserves the right to require modifications to the drawings.

Article 405. The licensee, after consultation with the U.S. Fish and Wildlife Service and the Washington Department of Wildlife, shall develop a plan to monitor the effect on the bald eagle of recreational use of project lands and waters, including hiking, boating, and fishing. Within 1 year from the date of issuance of this license, the licensee shall file for Commission approval a copy of a monitoring plan, comments from the above-mentioned agencies on the adequacy of the plan, and a schedule for filing the results of the monitoring program. The Commission reserves the right to require modifications to the plan and the schedule.

The results of the monitoring shall be submitted to the Commission according to the approved schedule, with the comments from the consulted agencies relating to the results. If the results of the monitoring indicate that additional measures are necessary to protect and enhance the bald eagle population, the licensee shall file for Commission approval, a schedule for implementing such measures, along with any comments from the above-mentioned agencies on the recommended measures. At the same time, copies of the schedule shall be served upon the agencies consulted.

Article 406. The licensee, after consultation with the U.S. Fish and Wildlife Service and the Washington Department of Wildlife, shall develop a plan to monitor the degree of mortality of goslings from operation of the project for a period of 5 years. Within 1 year from the date of issuance of this license, the licensee shall file for Commission approval a copy of a monitoring plan, comments from the above-mentioned agencies on the adequacy of the plan, and a schedule for filing the results of the monitoring program. The Commission reserves the right to require modifications to the plan and the schedule.

The results of the monitoring shall be submitted to the Commission according to the approved schedule, with the comments from the consulted agencies relating to the results. If the results of the monitoring indicate that measures are necessary to protect and enhance the Canada goose population, the licensee shall provide, for Commission approval, a schedule for implementing the measures, along with any comments from the above-mentioned agencies on the recommended measures. At the same time, copies of the schedule shall be served upon the agencies consulted. The Commission reserves the right to require measures to protect and enhance the Canada goose population.

Article 407. The licensee, after consultation with the U.S. Fish and Wildlife Service and the Washington Department of Wildlife, shall develop a plan to monitor the use of wood duck nest boxes installed at the project. Within 1 year from the date of issuance of this license, the licensee shall file for Commission approval a copy of a monitoring plan, comments from the above-mentioned agencies on the adequacy of the plan, and a schedule for filing the results of the monitoring program. The Commission reserves the right to require modifications to the plan and the schedule.

The results for the monitoring shall be submitted to the Commission according to the approved schedule, with the comments from the consulted agencies relating to the results. If the results of the monitoring indicate that measures are necessary to protect and enhance the wood duck population, the licensee shall provide, for Commission approval, a schedule for implementing the measures, along with any comments from the above-mentioned agencies on the recommended measures. At the same time, copies of the schedule shall be served upon the agencies consulted. The Commission reserves the right to require measures to protect and enhance the wood duck population.

Article 408. The licensee, within 6 months from the date of issuance of the license, shall file the results of a survey of all areas proposed to be disturbed by recreational development or by project operation and maintenance (such as the transmission line

rights-of-way and recreational sites) to determine the location of any rare and sensitive plant species. The plant survey shall be conducted by a qualified botanist during the flowering period. The licensee shall provide for a review of this survey by the U.S. Fish and Wildlife Service and the Washington Department of Wildlife.

If the results of the survey indicate that a rare or sensitive species would be adversely affected, the licensee shall file for Commission approval a mitigative plan to protect the affected species developed after consultation with the resource agencies. Agency comments shall be included in the filing. The Commission reserves the right to require changes to the plan.

Article 409. The licensee, after consultation with the Washington State Historic Preservation Officer (SHPO), the Colville Tribes (Tribes), and the Advisory Council on Historic Preservation (Council), shall complete and implement its cultural resources management plan prepared to avoid and mitigate impacts to archeological sites in the project vicinity listed or eligible for inclusion in the National Register of Historic Places. Within 1 year after the date of issuance of this license, the licensee shall file for Commission approval: (1) a copy of this plan, and (2) either copies of letters from the SHPO, the Tribes, and the Council, or an agreement signed by the licensee, the SHPO, the Tribes, and the Council, indicating that the plan is acceptable and will be implemented in a satisfactory manner. The plan shall adhere to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. To ensure that the plan is implemented in a satisfactory manner, the licensee shall, within 3 years after the date of issuance of this license, file a report containing: (1) the status and results of cultural resources investigations identified in the plan to avoid, mitigate, and/or monitor the potential for impacts of archeological sites listed or eligible for inclusion in the National Register of Historic Places that are located in the vicinity of the project; (2) any necessary revisions to the plan based on these investigations; and (3) copies of letters from the SHPO, the Tribes, and the Council commenting on the acceptability of the report. The Commission reserves the right to require changes to the plan. The licensee shall make funds available in a reasonable amount for implementation of the plan. If the licensee, the SHPO, the Tribes, and the Council cannot agree on the amount of money to be spent for implementation of the plan, the Commission reserves the right to require the licensee to conduct the necessary work at the licensee's own expense.

Article 410. The licensee, before starting any land-clearing or land-disturbing activities within the project boundaries, other than those specifically authorized in this license, shall consult with the Washington State Historic Preservation Officer (SHPO) and Colville Tribes (Tribes) and shall file for Commission approval a

cultural resources management plan, prepared by a qualified cultural resources specialist. If the licensee discovers any previously unidentified archeological or historic sites during the course of construction or development of project works or other facilities at the project, the licensee shall stop all land-clearing and land-disturbing activities in the vicinity of the sites, shall consult with the SHPO and the Tribes, and shall file for Commission approval a new cultural resources management plan, prepared by a qualified cultural resources management specialist.

Either management plan shall include the following: (1) a description of each discovered site, indicating whether it is listed or eligible to be listed on the National Register of Historic Places; (2) a description of the potential effect on each discovered site; (3) proposed measures for avoiding or mitigating the effects; (4) documentation of the nature and extent of consultation; and (5) a schedule for mitigating effects and conducting additional studies. The Commission may require changes to the plan.

The licensee shall not begin land-clearing or land-disturbing activities, other than those specifically authorized in this license, or resume such activities in the vicinity of a site discovered during construction, until informed by the Commission that the requirements of this article have been fulfilled.

Article 411. The Commission reserves the authority to order, upon its own motion or upon the recommendation of federal and state fish and wildlife agencies, affected Indian Tribes, and the Northwest Power Planning Council, alterations of project structures and operation to take into account to the fullest extent practicable the regional fish and wildlife program developed and amended pursuant to the Pacific Northwest Electric Power Planning and Conservation Act.

Article 412. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with, the covenants of the instrument of conveyance for any interests that it has conveyed under this article. If a permitted use and occupancy violates any conditions of this article or any other condition

imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modifications of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been contained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone

distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. Not later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located as least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d) (7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires that licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation

agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude land conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The settlement agreement filed in this proceeding on May 4, 1987, is approved and made a part of the license for Project No. 943.

(G) The Commission approval of the settlement agreement shall not constitute approval of, or precedent regarding, any principle or issue in these or any other proceedings.

(H) The exceptions taken to the initial decision issued January 31, 1986, in this proceeding are dismissed.

(I) (1) Whenever a violation of the settlement agreement occurs, the licensee shall, within 30 days of the occurrence, file with the Commission, and send a copy to the Regional Office, a report containing an explanation of the circumstances surrounding the violation and the licensee's plan to avoid any repetition thereof.

(2) Whenever a dispute arises under Section A.6 of the settlement agreement that is resolved without referral to the Commission, the licensee shall, within 30 days, file with the Commission, and send a copy to the Regional Office, a report containing an explanation of the dispute and the nature of the resolution.

(J) This order is final unless a request for rehearing is filed within 30 days from the date its issuance, as provided in Section 313(a) of the FPA. The filing of a request for rehearing does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of the order.

By the Commission.

(S E A L)

Linwood A. Watson, Jr.,
Acting Secretary.

Form L-5
(Revised October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION

TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED MAJOR PROJECT AFFECTING NAVIGABLE WATERS AND LANDS OF THE UNITED STATES

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer, of the Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction, maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease

or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a non-power licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated

by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such

determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such

compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be

reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 22. Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the Licensee shall convey to the United States, free of cost, such of its lands and rights-of-way and such rights of passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

Article 23. The operation of any navigation facilities which may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

Article 24. The Licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the Licensee or by the United States.

Article 25. The Licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

Article 26. Timber on lands of the United States cut, used, or destroyed in the construction and maintenance of the project works, or in the clearing of said lands, shall be paid for, and the resulting slash and debris disposed of, in accordance with the requirements of the agency of the United States having jurisdiction over said lands. Payment for merchantable timber shall be at current stumpage rates, and payment for young growth timber below merchantable size shall be at current damage appraisal values. However, the agency of the United States having jurisdiction may sell or dispose of the merchantable timber to others than the Licensee: Provided, That timber so sold or disposed of shall be cut and removed from the area prior to, or without undue interference with, clearing operations of the Licensee and in coordination with the Licensee's project construction schedules. Such sale or disposal to others shall not relieve the Licensee of responsibility for the clearing and disposal of all slash and debris from project lands.

Article 27. The Licensee shall do everything reasonably within its power, and shall require its employees, contractors, and employees of contractors to do everything reasonably within their power, both independently and upon the request of officers of the agency concerned, to prevent, to make advance preparations for suppression of, and to suppress fires on the lands to be occupied or used under the license. The Licensee shall be liable for and shall pay the costs incurred by the United States in suppressing fires caused from the construction, operation, or maintenance of the project works or of the works appurtenant or accessory thereto under the license.

Article 28. The Licensee shall interpose no objection to, and shall in no way prevent, the use by the agency of the United States having jurisdiction over the lands of the United States affected, or by persons or corporations occupying lands of the United States under permit, of water for fire suppression from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license, or the use by said parties of water for sanitary and domestic purposes from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license.

Article 29. The Licensee shall be liable for injury to, or destruction of, any buildings, bridges, roads, trails, lands, or other property of the United States, occasioned by the construction, maintenance, or operation of the project works or of the works appurtenant or accessory thereto under the license. Arrangements to meet such liability, either by compensation for such injury or destruction, or by reconstruction or repair of damaged property, or otherwise, shall be made with the appropriate department or agency of the United States.

Article 30. The Licensee shall allow any agency of the United States, without charge, to construct or permit to be constructed on, through, and across those project lands which are lands of the United States such conduits, chutes, ditches, railroads, roads, trails, telephone and power lines, and other routes or means of transportation and communication as are not inconsistent with the enjoyment of said lands by the Licensee for the purposes of the license. This license shall not be construed as conferring upon the Licensee any right of use, occupancy, or enjoyment of the lands of the United States other than for the construction, operation, and maintenance of the project as stated in the license.

Article 31. In the construction and maintenance of the project, the location and standards of roads and trails on lands of the United States and other uses of lands of the United States, including the location and condition of quarries, borrow pits, and spoil disposal areas, shall be subject to the approval of the department or agency of the United States having supervision over the lands involved.

Article 32. The Licensee shall make provision, or shall bear the reasonable cost, as determined by the agency of the United States affected, of making provision for avoiding inductive interference between any project transmission line or other project facility constructed, operated, or maintained under the license, and any radio installation, telephone line, or other communication facility installed or constructed before or after construction of such project transmission line or other project facility and owned, operated, or used by such agency of the United States in administering the lands under its jurisdiction.

Article 33. The Licensee shall make use of the Commission's guidelines and other recognized guidelines for treatment of transmission line rights-of-way, and shall clear such portions of transmission line rights-of-way across lands of the United States as are designated by the officer of the United States in charge of the lands; shall keep the areas so designated clear of new growth, all refuse, and inflammable material to the satisfaction of such officer; shall trim all branches of trees in contact with or liable to contact the transmission lines; shall cut and remove all dead or leaning trees which might fall in contact with the transmission lines; and shall take such other precautions against fire as may be required by such officer. No fires for the burning of waste material shall be set except with the prior written consent of the officer of the United States in charge of the lands as to time and place.

Article 34. The Licensee shall cooperate with the United States in the disposal by the United States, under the Act of July 31, 1947, 61 Stat. 681, as amended (30 U.S.C. sec. 601, et seq.), of mineral and vegetative materials from lands of the United States occupied by the project or any part thereof: Provided, That such disposal has been authorized by the Commission and that it does not unreasonably interfere with the occupancy of such lands by the Licensee for the purposes of the license: Provided further, That in the event of disagreement, any question of unreasonable interference shall be determined by the Commission after notice and opportunity for hearing.

Article 35. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 36. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 37. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

Attachment 2

June 21, 2004 - Order Amending the Rock Island Project License to implement the terms of an Anadromous Fish Settlement and Habitat Conservation Plan (HCP).

June 21, 2004 - Companion Order Granting Interventions; Approving Anadromous Fish Agreements, Settlement Agreement, and Applications to Amend Licenses; and Terminating Proceeding.

107 FERC ¶ 61,282
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Pat Wood, III, Chairman;
Nora Mead Brownell, and Joseph T. Kelliher.

Public Utility District No. 1 of Chelan County, Washington — Project No. 943-083

ORDER AMENDING LICENSE

(Issued June 21, 2004)

1. This order approves the application of Public Utility District No. 1 of Chelan County, Washington (Chelan), to amend the license for the Rock Island Project No. 943 in order to implement the terms of an Anadromous Fish Settlement and Habitat Conservation Plan (HCP) designed to protect Mid-Columbia River Basin salmonids, in particular threatened and endangered species. The Rock Island HCP and HCPs for two other Mid-Columbia River licensed projects were approved in a companion order issued today (Master Order).[1] These orders will serve the public interest by putting into place a long-term program to aid in the recovery of the endangered species and help to prevent other salmonids from becoming listed.

Background

2. The long history of the Columbia River anadromous fishery problem and the efforts of many actors to resolve issues specific to the Mid-Columbia River Basin are summarized in the Master Order and need not be repeated here. It suffices here to say that there are four major hydroelectric projects comprising five dams on the Mid-Columbia River, all of which are under Commission license. In order from upstream to downstream they are Wells, Rocky Reach, Rock Island, and Public Utility District No. 2

[1] Public Utility District No. 1 of Chelan County, WA, et al., 107 FERC ¶ 61,280. Separate orders amending the licenses for Chelan's Rocky Reach Project No. 2145 and Public Utility District No. 1 of Douglas County's Wells Project No. 2149 to implement those project-specific HCPs are also being issued today. Public Utility District No. 1 of Chelan County, WA, 107 FERC ¶ 61,281 (Rocky Reach); Public Utility District No. 1 of Douglas County, WA, 107 FERC ¶ 61,283 (Wells).

of Grant County Washington's (Grant) Wanapum-Priest Rapids Project No. 2114 (consisting of Wanapum and Priest Rapids Dams). In the late 1980's, the Commission commenced what has become known as the Mid-Columbia proceeding, in an effort to resolve anadromous fish issues for the licensed Mid-Columbia projects. Project-specific agreements were negotiated for the Rock Island and Wells Projects, which are conditions of those licenses. The Rocky Reach license has been amended to authorize installation of permanent downstream fish passage facilities and is subject to other requirements. Grant is currently required to release interim spill flows from Wanapum-Priest Rapids to assist downstream migration.

3. As these events were unfolding, two species of Columbia River salmonids were federally listed as threatened under the Endangered Species Act (ESA).[2] In the early 1990s, discussion commenced among the licensees, National Marine Fisheries Service within the U.S. Department of Commerce (NOAA Fisheries), U.S. Fish and Wildlife Service (FWS), Indian tribes, and others, with intention of developing long-term plans for the recovery of the listed salmonids and to prevent further listings (HCPs). HCP Agreements were reached for Wells, Rocky Reach, and Rock Island. Applications for approval of the HCPs and for incidental take permits[3] pursuant to ESA section 10 were filed by Chelan with respect to Rocky Reach and Rock Island, and by Douglas with respect to Wells. NOAA Fisheries granted the requested approvals and permits.

4. Chelan and Douglas also filed separate applications with the Commission for approval of the project-specific HCPs and for amendment of the Rocky Reach, Rock Island (Chelan), and Wells (Douglas) licenses to incorporate those documents into the appropriate licenses as special articles. The applications are opposed by the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Columbia River Intertribal Fish Commission, and American Rivers.

5. The Master Order addresses the objections of these parties and concludes that the HCPs are in the public interest and should be approved. We incorporate that discussion here by reference. Consistent with the Master Order, this order amends the Rock Island license to incorporate the HCPs.

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[2] 42 U.S.C. ' 4321 et seq.

[3] An incidental take permit exempts the permittee from the prohibition on taking of listed threatened or endangered species of section 9 of the ESA (16 U.S.C. § 1538).

6. Also, FWS issued a Biological Opinion pursuant to ESA section 7 regarding the effects of the projects with respect to various federally-listed threatened and endangered species. FWS found that incorporating the HCPs into the licenses is not likely to jeopardize the continued existence of the endangered bull trout, but did find that the operation of the three projects under the HCPs would result in incidental take of bull trout. Its Biological Opinion thus includes an incidental take statement with respect to each project, including Reasonable and Prudent Measures (RPMs) and associated Terms and Conditions for implementing the RPMs. The RPMs and Terms and Conditions for Rocky Reach are attached to this order, which also adds new license articles requiring them to be implemented.

7. Finally, a minor modification is made to the cultural resources management plan to require preparation of a map indicating the areas which might be affected by implementation of the HCP.

The Commission orders:

(A) The application of Public Utility District No. 1 of Chelan County, Washington, for approval of the Rock Island Project No. 943 Anadromous Fish Agreement and Habitat Conservation Plan, and for its adoption as an amendment to the project license, is granted.

(B) New Article 413 is added to the project license, to read as follows:

Article 413. (a) The licensee shall carry out its obligations as set forth in the Anadromous Fish Agreement and Habitat Conservation Plan (HCP Agreement) for the Rock Island Hydroelectric Project No. 943 filed with the Commission on November 24, 2003, and as approved by the Commission at 107 FERC ¶ 61,280 and ¶ 61,282. Further, the licensee shall file with the Commission (1) the final annual and comprehensive progress reports developed pursuant to the HCP Agreement; and (2) the final results of all studies and testing pursuant to the HCP Agreement.

(b) Prior to taking any action pursuant to the HCP Agreement that requires a change in the authorized project facilities or operations not specifically identified in the HCP Agreement, the licensee shall file a license amendment application.

(c) The licensee shall file design drawings prior to the implementation of any modification or addition to project works that is necessary to implement the HCP Agreement. The licensee shall file such design drawings for Commission approval at least 90 days prior to the start of construction or modification. The licensee will file as-built drawings with the Commission within 6 months after completion of construction or modification.

(C) New Article 414 is added to the project license, to read as follows:

Article 414. *Bull Trout – Reasonable and Prudent Measures and Terms and Conditions*. (a) Within six months of the issuance of the order amending license issued at 107 FERC ¶ 61,282 (2004), the licensee shall file for Commission approval a plan to implement the Reasonable and Prudent Measures and associated Terms and Conditions said order. The plan shall include provision for the annual report required by Article 412. The plan shall be prepared in consultation with the U.S. Fish and Wildlife Service, NOAA Fisheries, Washington Department of Fish and Wildlife, and interested Indian tribes.

(b) The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the consulted entities, and specific descriptions of how the entities' comments and recommendations are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reason's based on project-specific information.

(c) The Commission reserves the right to require changes to the plan. The plan shall not be implemented until the licensee is notified by the Commission that the plan is approved. Upon approval of the plan, the licensee shall implement the plan, including any changes required by the Commission.

(D) New Article 415 is added to the project license, to read as follows:

Article 415. *Annual Reports -- Implementation of Reasonable and Prudent Measures.* (a) The Licensee shall prepare and file with the Commission an annual report describing the impacts of the Reasonable and Prudent Measures and

associated Terms and Conditions prescribed by the U.S. Fish and Wildlife Service for the protection of bull trout. The report shall also be submitted to the Central Washington Field Office of the U.S. Fish and Wildlife Service and shall list and describe any adverse effects resulting from project activities on bull trout, including the number and life stages of individuals affected.

(b) Upon locating a dead, injured, or sick endangered or threatened species specimen, the licensee shall initially notify the Central Washington Field Office (Wenatchee, Washington; telephone 509-664-0658) within 48 hours. The licensee shall take care in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered species or preservation of biological materials from a dead animal, the licensee shall carry out instructions provided by the Service to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

(E) New Article 416 is added to the project license, to read as follows:

Article 416. *Reservation of Authority – Bull Trout Recovery Plan*. Authority is reserved to the Commission to require the licensee to carry out specified measures for the purpose of participating in the development and implementation of a bull trout recovery plan.

(F) The Cultural Resources Management plan for the Rock Island Project No. 943, approved at 53 FERC ¶ 62,255 (1990), is hereby modified to include within its scope any ground-disturbing activity on non-federal lands pursuant to the Tributary Conservation Plan provisions of the HCP Agreement approved by the Commission at 107 FERC ¶ 61,280 and this order. For this purpose, the licensee shall within 90 days prepare and provide to the SHPO and potentially affected Indian tribes a map delineating the Area of Potential Effect as defined in 36 C.F.R. § 800.16(d), and the map shall include the potential geographical scope of actions under the Tributary Conservation Plan.

By the Commission. Commissioner Kelly not participating.

(S E A L)

Linda Mitry,
Acting Secretary.

APPENDIX

U.S. FISH AND WILDLIFE SERVICE REASONABLE AND PRUDENT MEASURES AND IMPLEMENTING TERMS AND CONDITIONS REGARDING BULL TROUT

Reasonable and Prudent Measures

RPM 1. The Licensee to develop and implement, in coordination with the U.S. Fish and Wildlife Service (Service), appropriate measures to reduce impediments to up and downstream passage of adult and juvenile bull trout at Rocky Island Dam and its associated reservoir system. Should measures to reduce impediments to up- and downstream passage of bull trout warrant consideration of additional modifications to facilities or operations, as determined by the Service in consultation with the Commission and the licensee, the Service will work with the Commission and the licensee to insure that these measures are implemented, as appropriate, or recommend that the Commission reinitiate consultation if necessary.

RPM 2. The licensee shall design a monitoring program to (1) detect adverse effects resulting from the proposed action, (2) assess the actual level of incidental take in comparison with the anticipated incidental take level documented in the biological opinion, (3) detect when the level of anticipated incidental take is exceeded, and (4) determine the effectiveness of reasonable and prudent measures and their implementing terms and conditions. Specifically, the program shall be designed to monitor the abundance, distribution, and timing of adult and juvenile bull trout utilizing Rocky Reach Dam and its associated reservoir system. Implementation of this monitoring program shall begin no later than May 1, 2005. If information from the monitoring efforts warrants consideration of additional modifications to facilities or operations for the minimization of project effects on bull trout, as determined by the Service in consultation with the Commission and the licensee, the Service will work with the Commission and the licensee to insure these measures are implemented, as appropriate, or recommend that the Commission reinitiate consultation if necessary.

Terms and Conditions

1. To implement RPM 1, the licensee shall develop, in coordination with the Service, a prioritized list of monitoring efforts necessary to evaluate the effects of the Project on the up- and downstream passage needs of bull trout at Rocky Island Dam by February 28, 2005. Based on that prioritized list, the licensee shall initiate studies to evaluate the up- and downstream passage needs for bull trout at Rocky Reach Dam and to assess the

Project impacts on those passage needs. If the information from these studies warrants consideration of modifications to facilities or operations to reduce the take of bull trout, as determined by the Service in consultation with the Commission and the licensee, then the Service will work with the Commission and the licensee to ensure that these measures are implemented, as appropriate, or recommend that the Commission reinitiate consultation if necessary.

2. To implement RPM 1, the licensee shall, in coordination with the Service, develop a prioritized list of monitoring efforts necessary to determine the extent of bull trout entrainment through the turbines at Rocky Reach Dam by February 28, 2005. If the studies contained in the prioritized list are determined by the Service, in consultation with the Commission and the licensee, to be feasible, the licensee shall be required to assess the extent of bull trout entrainment through the turbines at Rocky Reach Dam. If entrainment is determined to be significant, the licensee will be required to explore techniques to minimize bull trout entrainment through the turbines.

3. To implement RPM 2, the licensee shall, in coordination with the Service, develop and implement a comprehensive bull trout monitoring program, that includes the presence of a sufficient number of radio-tagged (or other appropriate tracking technology) bull trout, to enable monitoring of bull trout utilizing Rocky Reach Dam and its associated reservoir system and tracking of the incidental take exemptions stated above.

4. During the interim period between the Commission' issuance of an order amending the Project license to include these RPMs and Terms and Conditions and the implementation of the monitoring plan called for in RPM 2, the licensee shall implement the following action items; specifically:

1. Extend the fish ladder monitoring period to assess adult bull trout use of existing fishways outside of the traditional migratory timeframes.

2. Continue coordinated telemetry monitoring of radio-tagged bull trout.

3. Compile project operational data linked to timeframes when adult migratory bull trout pass project powerhouses and/or spill gates.

4. Cost share funding with the Service for analysis of genetic samples from fluvial bull trout sampled during the first year of the Mid-Columbia Bull Trout Study.

5. Participate in a coordinated effort with the Service to increase the informational database for adult bull trout that utilize the Methow/Twisp river system.

If the level of incidental take on which these RMPs and Terms and Conditions is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided.

107 FERC ¶ 61,280
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Pat Wood, III, Chairman;
Nora Mead Brownell, and Joseph T. Kelliher.

Public Utility District No. 1 of Chelan County, WA	Project Nos. 2145-057 943-083
Public Utility District No. 1 of Douglas County, Washington	Project No. 2149-106

ORDER GRANTING INTERVENTIONS; APPROVING ANADROMOUS FISH AGREEMENTS, SETTLEMENT AGREEMENT, AND APPLICATIONS TO AMEND LICENSES; AND TERMINATING PROCEEDING

(Issued June 21, 2004)

1. This order grants the applications of Public Utility District No. 1 of Chelan County, Washington (Chelan) and Public Utility District No. 1 of Douglas County, Washington (Douglas) (together, the licensees) for approval of project-specific Anadromous Fish Agreement and Habitat Conservation Plans (HCPs)[1] regarding the operation of Chelan's Rocky Reach Project No. 2145 and Rock Island Project No. 943, and Douglas' Wells Project No. 2149. The Habitat Conservation Plans are intended to foster the recovery of endangered fish species in the Mid-Columbia River Basin. In companion orders issued today, we amend the licenses for the Rocky Reach, Rock Island, and Wells Projects to incorporate therein as special articles the respective project-specific Plans.[2] These orders

[1] Each Anadromous Fish Agreement and Habitat Conservation Plan is a single, project-specific document.

[2] Public Utility District No. 1 of Chelan County, WA, 107 FERC ¶ 61, 282 (Rock Island); Public Utility District No. 1 of Chelan County, WA, 107 FERC ¶ 61,281 (Rocky Reach); Public Utility District No. 1 of Douglas County, WA, 107 FERC ¶ 61,283 Wells).

will serve the public interest by putting into place a long-term program to aid in the recovery of the endangered species and help to prevent other salmonids from becoming listed.

I. Background

A. The Columbia River Anadromous Fishery Issue

2. The Columbia River historically produced the world's largest runs of Chinook salmon and steelhead trout, major runs of coho and sockeye salmon, and small numbers of chum and pink salmon.[3] In the 1930s, the U.S. Army Corps of Engineers and others began the construction of a series of major dams planned for the Columbia and Snake Rivers for the purposes of electric power,[4] flood control, and irrigation.

3. Proceeding downstream from the Canadian-U.S. border, the first two dams on the Columbia River are Grand Coulee and Chief Joseph, both of which are federally owned and operated. The next five dams are the so-called Mid-Columbia Dams, all of which are under Commission license. Proceeding downstream, they are: the 774-megawatt (MW) Wells;5 the 1,213-MW Rocky Reach;6 the 623-MW Rock Island;7 and the two-dam, 1,620-MW Wanapum-Priest Rapids Project No. 2114 (Priest Rapids). Priest Rapids is licensed to Public Utility District No. 2 of Grant County, Washington (Grant). The Mid-

[3] The Columbia River is 1,210 miles long, of which 460 miles are in Canada and 740 miles are in the United States. It drains an area of 259,000 square miles, including a great part of Washington and Oregon, substantially all of Idaho, the western portion of Montana, and smaller areas in Wyoming and Utah.

[4] The Columbia River and its tributaries represent one-third of the hydroelectric potential of the United States.

[5] The Wells Project was issued an original license in 1962. 28 FERC 128 (1962).

[6] The Rocky Reach Project was issued an original license in 1957. 18 FPC 33 (1957).

[7] The Rock Island Project was relicensed in 1989. 46 FERC ¶ 61,033 (1989).

Columbia reservoirs are used to create the necessary hydraulic head for power generation rather than for significant storage.

4. Downstream of the Mid-Columbia dams, the Columbia River is joined by the Snake and Walla Walla Rivers, and turns west toward the ocean. On this stretch of the river, which is called the main stem, are four federal dams: McNary, John Day, The Dalles, and Bonneville.[8]

5. Although most of the dams on the Columbia River were designed with fish passage devices to assist the upstream migration of adult fish returning to spawn, these dams are generally considered to have contributed to a significant decline in the numbers of migratory fish returning annually to the Columbia River drainage system to spawn. Moreover, originally no provisions were made to allow downstream migration of juvenile salmon (smolts) other than by passage over the dams in spills or through the generating turbines during power production. The Columbia River dams are believed to be cumulatively responsible for the mortality of a significant portion of the juvenile anadromous fish that annually migrate from the river system downstream to the ocean.[9]

B. The Commission's Mid-Columbia Proceeding

6. In 1978, the Washington Department of Fish and Wildlife (Washington DFW) filed a complaint against Grant, asserting that the minimum flows being released from Priest Rapids were insufficient to protect salmonid spawning and rearing areas downstream from Priest Rapids (Vernita Bar). Subsequently, various federal and state agencies and Indian tribes petitioned the Commission to require all of the Mid-Columbia projects to

[8] The location of all of the Columbia River projects is shown on page S-5 of the Environmental Impact Statement (EIS) prepared in this proceeding.

[9] The reservoirs decrease water velocity, which delays the migrants and may cause them to lose their migrating urge and become residents of the reservoirs. This means that they do not complete their anadromous life cycle, and also that they are exposed to increased predation. Downstream migrants also face hazards if they pass through the turbines, and if they pass downstream via spill they may suffer from elevated levels of oxygen in the blood (gas bubble disease).

provide increased minimum flows and spills at each dam to assist the migration of salmon and steelhead trout.

7. In 1979, the Commission consolidated these actions and set the matter for hearing, directing the presiding Administrative Law Judge (ALJ) to hold hearings on the matter of a long-term solution to the fish passage issues.[10] This was expected to require years of studies and proceedings. For the near term, the Commission delegated to the ALJ authority to establish interim operating measures for all four projects. Grant sought rehearing. A settlement was later reached and approved regarding interim measures, and the Commission determined that any ALJ decision on a long-term solution for Priest Rapids would, if it was opposed, not go into effect without Commission approval.[11]

8. The Commission approved a settlement agreement on the Vernita Bar phase of the Mid-Columbia proceeding and terminated that phase in 1988.[12] In 1992, the ALJ issued an initial decision requiring installation of physical bypass systems at Wanapum and Priest Rapids dams, and requiring interim spill requirements until the completion of physical bypass systems.[13] Exceptions to the initial decision were filed. In 1994, the Commission ordered Grant to release interim spill flows from Priest Rapids to assist the downstream passage of spring and summer migrants.[14] No action was taken on the initial decision, inasmuch as Endangered Species Act (ESA) proceedings soon eclipsed the ALJ proceeding.

9. Longer-term settlement agreements on anadromous fishery issues were approved in 1989 and 1991 with respect to Rock Island and Wells, respectively. Both the Rock Island Agreement and the Wells Agreement call for spill flows, hatchery programs, and other measures to protect and enhance the anadromous fishery. The order approving the Rock

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[10] 6 FERC ¶ 61,210.

[11] Public Utility District No. 2 of Grant County, WA, 16 FERC ¶ 61,043 (1981).

[12] 45 FERC ¶ 61,401.

[13] 58 FERC ¶ 63,022.

[14] Public Utility District No. 2 of Grant County, WA, 67 FERC ¶ 61,225.

Island Agreement incorporated that agreement into a new license for Rock Island, which expires in 2029.[15] The order approving the Wells Agreement incorporated that agreement into the Wells license, which expires in 2012, and terminated the Mid-Columbia proceeding as to the Wells Project.[16]

10. With respect to Chelan's Rocky Reach Project, studies were continued to determine an appropriate downstream passage method, and the Mid-Columbia Proceeding is still open as it pertains to that project.[17] The Rocky Reach license expires on June 30, 2006, with any new license applications due by June 30, 2004.

C. Proceedings at NOAA Fisheries

11. Section 10(a)(1)(B) of the ESA[18] authorizes the ESA agencies to issue to non-federal entities an incidental take permit (take permit) for species listed as endangered under the ESA. The ESA agencies are the National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildlife Service (FWS). The take permit allows a non-federal landowner to conduct an activity that results in an incidental take of listed species. An HCP must accompany an application for a take permit. An HCP is a planning document developed under ESA section 10(a)(2)(A) to ensure that the effects of the permitted action on listed species are adequately minimized and mitigated.[19] The take permit authorizes the take, but not the activity itself. The activity must comply with other applicable laws and regulations, such as holding a hydroelectric license.

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[15] Public Utility District No. 1 of Chelan County, WA, 46 FERC ¶ 61,033 (1989).

[16] Public Utility District No. 1 of Douglas County, WA, 54 FERC ¶ 61,056 (1991).

[17] The relevant subdocket is Project No. 2145-000.

[18] 16 U.S.C. § 1539(a).

[19] 16 U.S.C. §1 539(a)(2)(A).

12. The take permit exempts the permittee, when acting in compliance with the HCP, from the prohibition of ESA section 9 on the taking of listed species.[20]

13. The holder of a take permit also benefits from the certainty provided by the HCP. This is because the ESA agencies have a "no surprises" policy, under which the ESA agencies will not require additional commitments from the permittee beyond those agreed to in the HCP, even if there are unforeseen circumstances. In order for the no-surprises policy to apply, the permittee must be implementing the terms of the HCP, the take permit, and any other associated authorizations in good faith. In the hydropower licensing context, it is desirable for the HCP to become a condition of any license in effect during the term of the take permit, so that the two documents can be integrated. The HCP can be a more efficient means of ESA compliance for license applicants and the Commission than the approach traditionally used in licensing-- Commission consultation with the ESA agencies pursuant to ESA section 7.[21]

14. In 1993, Chelan, Douglas, and Grant entered into discussions with NOAA Fisheries, FWS, and Washington DFW to develop a long-term comprehensive program for managing fish and wildlife that inhabit the Mid-Columbia River Basin. Other entities, including the Confederated Tribes of the Colville Reservation (Colville), Confederated Tribes and Bands of the Yakama Indian Nation (Yakama), Confederated Tribes of the Umatilla Indian Reservation (Umatilla), and American Rivers, subsequently joined the negotiations. The Commission also assigned separated staff to assist the

[20] 16 U.S.C. § 1538. Section 9 makes it unlawful to "take" (kill, harm, harass, capture, etc.) listed endangered species. ESA section 11, 16 U.S.C. § 1540, establishes penalties for knowing violations of the act or of permits issued thereunder.

[21] 16 U.S.C. § 1536. Under the section 7 process, once a hydropower license application is filed, the Commission conducts consultation with the ESA agencies (often the license applicant is appointed as the Commission's non-federal representative) and issues a Biological Assessment. Thereafter, the ESA agency issues a Biological Opinion with a Reasonable and Prudent Alternative, including Reasonable and Prudent Measures designed to be placed any license the Commission issues to the applicant.

negotiations.[22] The scope of the negotiations was later narrowed to the development of an agreement for anadromous salmonids in light of the likelihood that certain species of salmon and steelhead would become listed species under the ESA.[23] Upper Columbia River steelhead and spring-run chinook salmon were subsequently listed under the ESA as endangered.[24]

15. In July 1998, as amended in May 2002, Chelan and Douglas (together, the licensees) submitted to NOAA Fisheries unexecuted versions of three HCPs, along with applications for incidental take permits.

16. NOAA Fisheries, with the Commission participating as a cooperating agency, issued in November 2000 a Draft Environmental Impact Statement (EIS) on the HCPs. In April 2002, the HCPs were executed by the relevant licensee, NOAA Fisheries, FWS, Washington DFW, and Colville. In December 2002, NOAA Fisheries issued the Final EIS.

17. NOAA Fisheries' consideration of the take permit applications included preparation of project-specific Biological Opinions pursuant to section 7 of the ESA[25] for the operation of each project under the terms of the applicable HCP, and six separate Biological Opinions for the operation of Chelan's three and Douglas' three hatchery

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[22] See Public Utility District No. 2 of Grant County, WA, et al., letter order issued September 8, 1999, in Project No. 2145-000. Separated staff are staff members designated to assist the parties to a proceeding and are "non-decisional" for the purpose of the proceeding; that is, they are take no part in the Commission's consideration of any application filed in the proceeding.

[23] 16 U.S.C. '' 1531-43.

[24] 62 Fed. Reg. 43,973 (August 18, 1997) (steelhead); 64 Fed. Reg. 41,835 (August 22, 199) (spring-run Chinook). Critical habitat for both species was designated on February 16, 2000, 69 Fed. Reg. 7764.

[25] 16 U.S.C. § 1536.

facilities. NOAA Fisheries thereafter issued a take permit for the operation of each project[26] and for each hatchery facility.

D. License Amendment Applications

18. On November 24, 2003, the licensees filed separate applications for approval of the project-specific HCPs and for their incorporation as articles in the applicable licenses. The Rock Island and Wells applications request that those licenses be amended by replacing the Rock Island and Wells Agreements, respectively, with the project-specific HCPs. There is no Rocky Reach agreement on anadromous fisheries to be replaced.

19. On December 5, 2003, the Commission issued public notice of the applications and of its intent to adopt NOAA Fisheries' EIS for purposes of its environmental analysis of the amendment applications.[27] Timely motions to intervene in all three applications were filed by the Washington Department of Ecology (Ecology); Washington DFW; NOAA Fisheries; Yakama; the Columbia River Inter-Tribal Fish Commission and Umatilla (together, CRITFC);[28] U.S. Department of Agriculture (Agriculture); and American Rivers.[29] The motions to intervene of CRITFC, Yakama, and American Rivers were accompanied by protests.[30]

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[26] Permit Nos. 1391 (Wells), 1392 (Rocky Reach), and 1393 (Rock Island), all issued August 20, 2003.

[27] 68 Fed. Reg. 69,393-94 (Dec. 12, 2003). The deadline for interventions was January 9, 2004.

[28] CRITFC was created in 1977 by the Nez Perce Tribe, Umatilla, Yakama, and the Confederated Tribes of the Warm Springs Reservation of Oregon for the purpose of establishing a broad general fisheries program to promote the conservation practices of its members.

[29] Effective October 15, 2003, 18 C.F.R. § 385.214(a)(2) allows the U.S. Departments of Agriculture, Commerce, and the Interior; the Advisory Council on Historic Preservation; any state fish and wildlife, water quality certification, or water rights agency; and any Indian tribe with authority to issue a water quality certification to intervene in any proceeding by filing a timely notice of intervention instead of a motion to intervene.

20. The City of Entiat, Washington, and Entiat School District No. 127 (Entiat) filed a motion to intervene in the Rocky Reach proceeding. Entiat does not protest that application, but expresses concern about potential impacts to that community and questions the adequacy of the EIS.

21. A late motion to intervene was filed by the U.S. Department of the Interior. Pursuant to Rule 214(d)(1) of our Rules of Practice and Procedure,[31] we will grant Interior's motion because its late intervention will not delay or disrupt the proceeding or prejudice other parties.

22. Comments supporting the applications were filed by U.S. Senator Patty Murray, U.S. Representatives Norm Dicks and Doc Hastings, and Washington State Governor Gary Locke.

23. Chelan timely filed a consolidated answer to the motions to intervene of CRITC, Umatilla, and Yakama, and separate answers to the motions to intervene of Entiat and American Rivers. Douglas filed an answer to the motions to intervene of CRITFC, Umatilla, Yakama, American Rivers, and Agriculture. With one exception discussed below, the licensees do not oppose intervention by any of these entities, but express disagreement with various statements made in the motions to intervene or protests.[32]

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[30] CRITFC, Umatilla, and Yakama submitted a combined protest, which is referred to as CRITFC protest.

[31] 18 C.F.R. § 385.214(d)(1).

[32] 18 C.F.R. § 385.213(a)(2) prohibits and answer to a protest unless otherwise ordered by the decisional authority. Because Chelan's and Douglas' answers will not delay or disrupt the proceeding and may assist in our consideration of the issues raised by the Indian tribes, American Rivers, and Entiat, we will accept their answers.

24. On February 11, 2004, the Commission held a public technical conference to allow the licensees to present the details of the HCPs to the Commission staff and interested parties.[33] On March 1, 2004, the licensees filed a joint response to certain statements made by CRITFC at the technical conference (Joint Response).

II. Discussion

25. The HCPs have been in development for over ten years. We commend all of the participants in the negotiations for their patience and dedication in developing a plan for operating the Rocky Reach, Rock Island, and Wells Projects in a manner that aids in the recovery of the endangered species and helps to prevent additional listing of Mid-Columbia salmonids. As discussed below, we find that the HCPs are appropriately designed to reach that goal and are in the public interest. We will therefore amend the project licenses to include the HCPs as terms thereof.

A. Agriculture Department's Motion to Intervene

26. Agriculture, of which the U.S. Forest Service is a part, moved to intervene in the Wells proceeding (Project No. 2149) on the basis that the Wells Project would, in the context of implementing the tributary conservation plan for Wells,[34] "utilize federal lands within the Okanogan-Wenatchee National Forest," and could therefore affect "lands and resources of the National Forest System, including the Methow River System and its tributaries . . . administered by the Department."[35]

27. Douglas appears to oppose Agriculture's motion to intervene, stating that the Department has "no real property holdings" within the Wells Project boundary, and that were Douglas to undertake any activity on lands or waters administered by the Forest Service, it would first need the Forest Service's authorization.[36]

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[33] 69 Fed. Reg. 2,136 (Jan. 14, 2004).

[34] See Wells HCP section 7, and discussion below.

[35] Agriculture motion at 2.

[36] Douglas answer at 15.

28. Douglas appears to be correct that there are no National Forest lands within the project boundary. Nonetheless, we think the possibility that certain HCP implementation measures may be carried out on National Forest lands gives Agriculture a sufficient interest in the outcome of this proceeding to warrant the grant of its intervention motion.

B. Status of the Mid-Columbia Proceeding

29. On April 23, 2004, the Chief ALJ issued an order to show cause why, in light of the fact that several years had passed without any need for his assistance as ALJ, the Mid-Columbia proceedings before him should not be terminated. Grant responded that it would not object to termination of the proceeding with respect to Priest Rapids because the initial decision is before the Commission. Chelan, citing the HCP agreement and the status of related actions such as ESA consultation, agreed that the proceeding with respect to Rocky Reach should be terminated.

30. NOAA Fisheries responded that the Chief ALJ should retain jurisdiction, because fisheries issues have not been resolved at Priest Rapids, and because it believes the 1994 interim spill provisions are no longer adequate, particularly in light of the addition of affected stocks to the federal endangered species list. It states that the continuing jurisdiction of the Chief ALJ is beneficial to the efforts of Grant and the intervenors to reach a new, long-term settlement agreement. We leave this matter to the Chief ALJ's discretion as to Priest Rapids. Consistent with our decision to approve the Rocky Reach HCP, we will terminate the Mid-Columbia proceeding as to that project.

C. Summary of the HCPs

31. The HCPs are intended to be a comprehensive and long-term management plan for plan species affected by the projects, i.e., Chinook salmon, sockeye salmon, coho salmon, and steelhead.[37] The objective of the HCPs is to achieve and maintain for the duration of the HCPs "no net impact" for each plan species. This is to be accomplished by a combination of fish passage measures, hatchery programs, and fish habitat enhancement work along tributary rivers and streams. The HCPs are summarized below. Unless otherwise noted, the discussion pertains to all of the agreements.

[37] Sockeye and Coho are not listed. The provisions of the HCP are intended to help ensure that they do not become listed.

32. Section 1 provides for a 50-year HCP term. Section 2 defines circumstances under which parties may withdraw.

33. Section 3 provides for no net impact to be achieved on a specified schedule and maintained for the duration of the HCP Agreement for each plan species.[38] "No net impact" has two components: (1) a combined adult and juvenile project survival standard (project survival standard) of at least 91 percent,[39] and (2) up to 9 percent compensation for "unavoidable project mortality."[40] Of the nine percent compensation, up to seven percent would be provided through the hatchery programs, and up to two percent through the tributary programs.

34. The licensees are responsible for achieving the 91-percent project survival standard through project-specific improvement measures. They will also be responsible for (1) funding the two-percent tributary conservation plan, (2) providing capacity and funding for the seven-percent hatchery compensation plan, and (3) making capacity and funding adjustments to the hatchery compensation plan to reflect and compensate for future increases in run size for each plan species.[41] If the licensee is not able to achieve the

[38] No net impact is to be achieved at Rocky Reach and Rock Island by 2013 and at Wells by 2018.

[39] This means that 91 percent of each plan species (juvenile and adult combined) survive project effects when migrating through each project. It includes direct, indirect, and, where it can be measured, delayed mortality.

[40] "Unavoidable project mortality" refers to the assumed 9-percent project-related mortality rate for which compensation is provided. HCP section 13.30.

[41] If the run size increases, the amount paid into the hatchery fund is reduced.

project survival standard at its project, it must consult with the signatories to the HCP through a coordinating committee established to jointly seek a solution, as discussed below.[42]

35. HCP section 5 (Wells section 4) establishes the passage survival plan for achieving and maintaining the 91-percent project survival standard. Compliance will initially be measured based on juvenile passage survival (the adult survival rate is assumed to be 98-100 percent).[43] Because of technological limitations on the accuracy of passage measurements, the standard used for assessing juvenile passage survival will vary with the plan species.

36. The passage survival plan has three implementation phases.[44] In Phase I, each licensee will implement a juvenile and adult operating plan and criteria intended to meet the "no net impact" standard and a monitoring and evaluation program to determine compliance with the standards. If the coordinating committee determines that the project survival standard has not been achieved for each plan species following the completion of a three-year study, the licensee will proceed to Phase II for that species. Phase II requires a set of project-specific measures to be taken, which will then be evaluated against the project survival standard.[45] If the Phase II measures fail to achieve the project survival standard for a Plan species, additional measures are to be taken, which are to be selected

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[42] The coordinating committee will oversee all aspects of the standards, methodologies, and implementation of the HCPs by various means, including establishing methods to determine if survival standards are being achieved; determining if the signatories are carrying out their responsibilities; determining if no net impact is achieved; approving study plans and reviewing study results; making adjustments to the passage survival plan; resolving disputes; and adjusting schedules and dates for performance. See Rock Island and Rocky Reach HCP section 4; Wells HCP section 5.

[43] It is difficult with available technology to differentiate between hydroelectric project-related adult mortality and natural mortality.

[44] Rock Island and Wells HCP section 5.3; Wells HCP section 4.2.

[45] E.g., Rock Island HCP section 5.3.2 (measures to be determined by the coordinating committee subject to specified criteria).

according to specified criteria, such as likelihood of success, timing, and cost-effectiveness. The licensee will continue to implement the Phase II measures until the project survival standard is achieved for each Plan species, unless the coordinating committee determines that the standards are impossible to achieve.

37. If the coordinating committee determines, at the end of either Phase I or Phase II, that the project survival standard has been achieved for a plan species, the parties will proceed to Phase III, during which the licensee maintains the project survival standard for that species, and juvenile survival continues to be periodically evaluated as determined by the coordinating committee.

38. Section 6 (Wells section 5) provides for the protection of reservoir habitat and water quality by requiring the licensees, when making land-use or related permit decisions, to consider the cumulative impact of those decisions in order to satisfy the conservation objectives of the HCP, the license, and any applicable law. The licensees also agree to notify and consider the comments of the parties regarding any land-use permit application on project lands.

39. Section 7 establishes the tributary conservation plan, under which each licensee will fund a plan species account for measures for the protection and restoration of plan species habitat.[46] Each licensee is responsible for funding an account applicable to a designated geographic area.[47] The projects will be selected by a tributary committee of

[46] Douglas will make an initial contribution to the plan species account of $1,982,000 ($1998) and have the option at the end of the fifth year to make annual payments thereafter of $176,178 ($1998) or a lump-sum payment. Wells HCP section 7.4. Chelan would make annual contributions of $229,800 (Rocky Reach) and $485,000 (Rock Island) ($1998), but other signatories may elect to receive any of the annual payments for the first fifteen years in advance. Rocky Reach and Rock Island HCPs section 7.5.

[47] For instance, projects for which Douglas will provide funding are to be located between the Chief Joseph and Wells tailraces and in the Methow and Okanogan River watersheds. Wells HCP section 7.2. Projects for which Chelan will provide funding are to be located between Chief Joseph tailrace and Rock Island tailraces and the Methow, Okanogan, Entiat, and Wentachee River watersheds. Rock Island and Rocky Reach HCPs section 7.2.

representatives of the signatories in accordance with criteria and priorities set forth in the HCP.[48] Each licensee will separately fund a tributary assessment program to monitor and evaluate the performance of the chosen projects.

40. Section 8 establishes the hatchery compensation plan, under which the licensees will provide funding and hatchery capacity to compensate for unavoidable project mortality and to meet the seven-percent hatchery compensation level needed to achieve no net impact. The initial estimates of hatchery production capacity will be adjusted periodically, and hatchery production commitments for passage losses will be adjusted periodically based on the juvenile project survival estimates.

41. In section 9 of the HCP, the signatories provide various assurances with respect to regulatory approvals, project licensing, limitations on reopening the licenses, and other matters. These include:

42. If the licensee is in compliance with its incidental take permit, the HCP, and other license provisions relating to the plan species, the parties will not institute any action against the licensee under the ESA, FPA, or other relevant legislation.[49]

43. If the licensee is in compliance with the HCP, the parties will support its new license application(s) with respect to plan species filed with the Commission during the term of the HCP.[50]

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[48] HCP section 7.3.

[49] Rock Island and Rocky Reach HCP section 9.1.2; Wells HCP section 9.4.2. These sections, which are identical, specify the Fish and Wildlife Coordination Act, 16 U.S.C. ' 661 et seq.; Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. ' 839 et seq.; and the Essential Fish Habitat provisions of the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801 et seq.

[50] Rock Island and Rocky Reach HCP section 9.2.1; Wells HCP section 9.5.1.

44. The HCPs will be NOAA Fisheries' and FWS' recommendations for plan species pursuant to FPA sections 10(a), 10(j), and 18, subject to a reservation of authority to prescribe fishways under section 18 if the HCP terminates.[51]

45. With certain exceptions, the parties will not invoke any reopener clauses in the project licenses for the purpose of obtaining additional measures for the plan species. [52]

46. If the licensee is in compliance with the HCP, the parties will not during its term advocate for or support additional or different fish protection measures or changes in project structures or operations other than those set forth in the HCP.[53]

47. Section 9 reflects the no-surprises policy of NOAA Fisheries and FWS; that is, non-federal landowners with an HCP and take permit are assured that if "unforeseen circumstances" arise, then as long as the permittee is implementing the terms and conditions of the HCP, permit, and any other associated documents in good faith, neither agency will unilaterally require the landowner to commit land, water, or financial resources, or restrict the use of land, water, or other natural resources, beyond the level otherwise agreed to in the HCP.[54]

D. Tribal Issues

48. CRITFC and Yakama assert that numerous aspects of the HCPs and the EIS violate the Commission's trust responsibility to them. They refer to: (1) termination of the Mid-Columbia proceeding and the Wells and Rock Island Agreements; (2) the incorporation of NOAA Fisheries' and FWS' no-surprises policy into the HCPs; (3) lack of provision for recovery of stocks to sustainable, harvestable levels; (4) no guarantee that the

[51] Rock Island and Rocky Reach HCP section 9.2.2; Wells HCP section 9.5.2.

[52] Rock Island and Rocky Reach HCP section 9.3; Wells HCP section 9.6.

[53] Rock Island and Rocky Reach HCP section 9.7; Wells HCP section 9.10.

[54] See 50 C.F.R. § 222.303(g); and http://endangered.fws.gov/hcp/nosurpr.htm.

hatchery component will continue; (5) lack of provisions to protect sturgeon and lamprey; and (6) inadequate consideration in the EIS of alternatives to the HCPs. We consider the merits of these and other assertions below.

49. Also, Yakama states that its interest in this proceeding is to assure that its "Treaty reserved 'Trust resources'" are protected.[55] The licensees acknowledge that pursuant to treaty the tribes are entitled to a "fair share" of off-reservation Columbia River basin fisheries in common with other citizens of the State,[56] but they dispute that this right is subject to any trust responsibility, and disagree that such off-reservation fish constitute "trust resources."[57] They add that even if off-reservation fish and Pacific lamprey are trust resources, the tribes are entitled only to the protections afforded by license terms and conditions required by the Commission in fulfillment of its FPA responsibilities.[58]

50. The Commission recognizes the unique relationship between the United States and Indian tribes as defined by treaties, statutes, and judicial decisions. We carry out our responsibilities towards Indian tribes in the context of the FPA and other statutes that establish Commission responsibilities. We recognize the cultural and economic significance to the Tribes of the plan species in these proceedings, and will carry out our responsibilities under the FPA with those considerations in mind.

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[55] In addition to salmonids, Yakama states that its trust resources include Pacific lamprey and sturgeon. Motion to intervene at 4.

[56] Douglas answer at 5, citing Nez Perce Tribe v. Idaho Power Co., 847 F. Supp. 791 (D. Idaho), citing Washington Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658 (1979).

[57] Chelan claims that the term "Indian trust resources" is not defined in the Commission's tribal consultation policy statement or in any other laws or regulations binding on the Commission in this proceeding. Chelan answer to CRITFC at 5 n. 7.

[58] Chelan answer to CRITFC at 4-5; Douglas answer at 4-5. They apply the same reasoning to Pacific lamprey.

E. Compliance with the Rock Island and Wells Licenses

51. Yakama states that the 1989 Rock Island and 1991 Wells Agreements[59] are contracts that require all of the parties thereto to jointly petition the Commission in order to remove those agreements as conditions of the Wells and Rock Island licenses. It characterizes Commission approval of the HCPs as unilateral terminations of these agreement, and asks that the HCPs be modified to ensure that they provide for Yakama's continued participation in management of the plan species.[60] The licensees respond that both agreements contain reopener provisions that may be invoked by any party after the expiration of a period specified in the project-specific agreement.[61]

52. The licensees are correct. The Rock Island Agreement establishes Chelan's obligations for the first thirteen years of the term of the agreement (i.e., 1987-2000). It provides that any party may thereafter initiate negotiations or file a petition to modify the agreement's terms and conditions or to replace the agreement in whole or in part.[62] The Wells Agreement is similarly subject to modification following March 1, 2004.[63] In any event, both licenses contain a reservation of Commission authority at any time during the license term to require alterations to project facilities and operations that may be warranted by changed circumstances.[64]

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[59] These agreements are described above; see "The Commission's Mid-Columbia Proceeding."

[60] Yakama protest at 3, 7.

[61] Chelan answer to CRITFC at 3-4; Douglas answer at 2-4.

[62] See 46 FERC at 61,195.

[63] See 54 FERC at 61,208.

[64] See 46 FERC at 61,198 (Rock Island); 54 FERC at 61,210 (Wells).

F. Relationship of Rocky Reach HCP to Relicensing (Project No. 2145)

53. CRITFC and American Rivers assert that approval of the Rocky Reach HCP will predetermine the terms and scope of the Rocky Reach relicense proceeding (applications for which are due June 30, 2004), because Chelan's application will be composed substantially of the HCP. They further assert that consideration of the HCP at this point would cause duplicative environmental review, ESA section 7 consultation, and Clean Water Act certification. American Rivers adds that this would strain the resources of interested stakeholders as well as agencies. They urge us to delay consideration of the Rocky Reach HCP until it is encompassed within Chelan's application for a new license.[65]

54. Chelan replies that any entity that did not sign the Rocky Reach HCP will be free to make any argument in the relicense proceeding with respect to anadromous fish, since only the parties have agreed to support the HCP on relicensing, nor does the HCP bind the Commission at relicensing. Chelan adds that the timing of action on the relicense applications is uncertain, and that consolidation of the proceedings would delay implementation of the HCP's measures to comply with the ESA. In contrast, it states, going forward with the HCPs now should help expedite relicensing, since the agency parties have agreed that the HCPs will constitute their license recommendations and conditions under FPA sections 10(a), 10(j), and 18.[66] Finally, Chelan says there would be no duplication, because the standards for review of license amendment applications and new license applications are different.[67]

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[65] CRITFC protest at 8-9; American Rivers protest at 4-5.

[66] Chelan answer to American Rivers at 5, citing Rocky Reach HCP section 9.2.2 (Wells section 9.5.2).

[67] Chelan notes various additional factors the Commission must consider with respect to new license applications, as required by FPA section 15(a)(2), 16 U.S.C. § 808(a)(2). See order section F.4 (Technical Analysis) below.

55. The HCPs are designed to aid in the recovery of endangered species, and we find them to be in the public interest. Given that, and the uncertainty as to when the Rocky Reach relicense proceeding will be concluded, we think it appropriate to approve the HCP at this time. Nor does our decision here necessarily dictate the result of the Rocky Reach relicensing with respect to anadromous fish. In the Rocky Reach relicense proceeding, we will examine whether the HCPs should be included in any new license to Chelan (or any competing applicant). Our approval of the Rocky Reach HCP in this proceeding will undoubtedly influence our decision on that issue, but the FPA requires us to fully consider all evidence and arguments presented in the relicense proceeding on this and any other issues,[68] and we shall do so.

G. Environmental Impact Statement

1. Cooperating Agency Status

56. CRITFC argues that the Commission must recirculate or supplement the EIS, because the Commission was not actually a cooperating agency for NOAA Fisheries' EIS.[69] CRITFC states that section 1501.6 of the Council on Environmental Quality's (CEQ) regulations requires a cooperating agency to: (1) have jurisdiction over the federal action, (2) have special expertise in the relevant issues, or (3) be requested by the lead agency to serve as a cooperating agency.[70] CRITFC argues that none of these requirements has been satisfied.[71]

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[68] The purpose of relicensing is to examine the public interest with respect to an existing project in light of currently applicable laws and policies. Confederated Tribes and Bands of the Yakama Indian Nation v. FERC, 746 F.2d 466, 470-71 (9th Cir. 1984), cert. denied, 471 U.S. 1116 (1985) (Yakama).

[69] See 40 C.F.R. § 1506.3(c), which provides:

A cooperating agency may adopt without recirculating the environmental impact statement of a lead agency when, after an independent review of the statement, the cooperating agency concludes that its comments and suggestions have been satisfied.

[70] 40 C.F.R. § 1501.6.

[71] CRITFC protest at 8.

57. Section 1501.6 states, in relevant part:

> Upon request of the lead agency, any other Federal agency which has jurisdiction by law shall be a cooperating agency. In addition, any other Federal agency which has special expertise with respect to any environmental issue which should be addressed in the [environmental impact] statement may be a cooperating agency upon request of the lead agency. Any agency may request the lead agency to designate it a cooperating agency.

58. The Commission has jurisdiction over the federal action because the licensees have filed applications to amend their licenses to include the HCPs as special articles. That the HCPs also require approval by NOAA Fisheries in the context of the incidental take permit applications does not affect this Commission's jurisdiction over the license application. The Commission was moreover identified as cooperating agency in the January 1999 EIS scoping brochure issued by NOAA Fisheries, and in the scoping summary attached to the September 1999 second post-scoping meeting notice. We think this suffices to establish compliance with section 1501.6. Commission staff also participated in the preparation of the EIS by co-facilitating the scoping meetings with NOAA Fisheries, reviewing comments received on the scoping documents and the Draft EIS, reviewing drafts of the Draft and Final EISs, and providing technical support for drafting the EIS and responses to comments on the Draft EIS.

59. Special expertise is a separate basis; the Commission has special expertise in analyzing fishery issues and writing enforceable license articles for the mitigation, protection, and enhancement of fishery resources. More specifically, this proceeding is just one of many in which we have analyzed a project's environmental impacts on, and developed measures benefitting, Pacific Ocean salmonids, including numerous NEPA documents pertaining to the fisheries impacts of license amendment applications for Mid-Columbia projects.[72]

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[72] E.g., Public Utility District No. 2 of Grant County, WA, 95 FERC ¶ 61,338 (2001) (spill flow requirement variance); Public Utility District No. 1 of Chelan County, WA, 99 FERC ¶ 61,059 (2002) (juvenile fish bypass system), 99 FERC ¶ 61,279 (2002) (installation of new, small turbines); 98 FERC ¶ 61,090 (2001) (installation of piling to

2. Baseline for Environmental Analysis

60. Yakama states that the FPA and the National Environmental Policy Act of 1969 (NEPA)[73] require the environmental analysis of an application to be based on pre-project conditions. Yakama asserts that this is inherent in the requirement of section 10(a)(1) for the Commission to give equal consideration to developmental and non-developmental resource values in license proceedings, and in the requirement of section 10(j) that licenses include "adequate and equitable" fish and wildlife protection, mitigation, and enhancement measures. Absent a pre-project baseline, it indicates, NOAA Fisheries and FWS cannot fulfil their responsibilities under FPA sections 10(a), 10(j), and 18.[74] CRITFC agrees that a pre-project baseline should be used, and adds that NOAA Fisheries' 2000 Federal Columbia River Power System Biological Opinion (2000 Biological Opinion)[75] used a "natural river" baseline to measure improvements in the condition of salmonids and to determine adult survival standards.[76]

61. Neither NEPA nor the FPA requires environmental analysis of an application to be based on pre-project conditions. The Commission's practice of using current conditions as the baseline for environmental analysis has been judicially affirmed,[77] and the Commission recently declined to change its practice in this regard when it amended its

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support juvenile bypass system); and 96 FERC ¶ 61,300 (2001) (pool raise).

[73] 16 U.S.C. § 4321 et seq.

[74] Although none of the applications is for a new license, to which sections 10(a), 10(j), and 18 clearly apply, Yakama points out that the HCPs are intended to support future new license applications for Wells and Rocky Reach. Yakama protest at 6.

[75] The 2000 Biological Opinion addresses the operation of the FCRPS and 19 Bureau of Reclamation projects. It defines a Reasonable and Prudent Alternative for the operation of the system intended to improve survival and the likelihood of recovery for endangered Columbia River salmonids.

[76] CRITFC EIS comments at 9-10; protest at 5.

[77] American Rivers v. FERC, 187 F.3d 1007, reh'g denied, 201 F.3d 1186

license application processing rules.[78] That NOAA Fisheries may have used a different baseline for analysis in separate proceeding is not sufficient reason for the Commission to change its well-established and judicially affirmed practice.

3. Supplemental EIS

62. Section 102(2)(E) of the NEPA[79] requires action agencies to analyze proposed federal actions and reasonable alternatives. The range of reasonable alternatives that must be discussed is a matter within an agency's discretion,[80] and decreases as the environmental impact of the proposed action becomes less substantial.[81] A discussion of environmental alternatives need not be exhaustive, and need only provide sufficient information to permit a reasoned choice of alternatives.[82]

(9th Cir. 1999).

[78] See Order No. 2002, 68 Fed. Reg. 51,070 (August 25, 2003), III FERC Stats. & Regs., Regs. Preambles & 31,149 at 51,097 (July 23, 2003).

[79] 16 U.S.C. § 4332(2)(E).

[80] See Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 551-52 (1976).

[81] See Olmstead Citizens for a Better Community v. U.S., 793 F.2d 201, 208 (8th Cir. 1986).

[82] See North Carolina v. FPC, 533 F.2d 702 (D.C. Cir. 1976).

63. The EIS considered three alternatives: (1) no action, (2) anadromous fish conservation measures adopted pursuant to ESA section 7 consultation; and (3) the preferred alternative, HCPs.[83] Alternatives considered but eliminated from detailed study included dam removal, additional spill flows, and issuance of non-power licenses.[84]

64. CRITFC also objects to the Commission adopting NOAA Fisheries' environmental analysis of the HCPs, because NOAA Fisheries' incidental take permits have a 50-year term, but the licenses to which the HCPs will be added have remaining terms of less than 50 years.[85] This distinction is of no significance. The EIS assumes that the HCPs not only will be in the existing licenses for the remainder of their terms, but also will be included as conditions of any new licenses issued for these projects. This is entirely appropriate, since the HCPs are designed for no net impact to be attained over a period of several years, and then maintained for the remainder of the take permits' 50-year terms. For instance, no net impact is to be achieved at Rocky Reach by 2013, which is likely to be within the term of any new license issued for that project. Therefore, even if the Commission were to conduct a completely separate analysis of the HCPs, it would still have to assume that the HCPs will be included in any new license. That is not to say that the Commission is bound to include the HCPs in any new licenses for these projects, but only that the analysis of the HCPs' environmental impacts can only be done if they are assumed to be in place.

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[83] Alternative 2, conservation measures, is based on the ESA section 7 process; that is, the Commission would provide NOAA Fisheries with a biological assessment describing project impacts and any proposed protection measures. NOAA Fisheries would then determine if the proposed action is likely to jeopardize the continued existence of the listed species or result in the destruction or modification of their critical habitat. Depending on its conclusions, NOAA Fisheries could recommend additional protection measures for the listed species.

[84] See EIS at pp. 2-69 to 2-73.

[85] CRITFC protest at 8.

65. CRITFC also argues that the Commission should conduct an ecosystem based EIS that includes an examination of the operations of all hydroelectric projects on the Mid-Columbia River, from the Grand Coulee Dam upstream of these licensees' projects to McNary Dam downstream, and should as well include the operations of the Federal Columbia River Power System.[86] We disagree. The proposed federal action that the EIS addresses is limited in scope: the implementation of the HCPs for Wells, Rocky Reach, and Rock Island. The licensees have no control over the upstream or downstream projects, and nothing done in the context of the HCPs will affect how those projects are operated. The HCPs will contribute to the rebuilding of tributary habitat production capacity and basic production and numerical abundance of the plan species, which can only contribute to the overall improvement of the Columbia River Anadromous Fishery.

66. CRITFC and Yakama contend that neither action alternative provides the protection necessary to meet the species recovery goal of the ESA or the tribes' own goal of sustainable, harvestable populations.[87] They state that NOAA Fisheries' findings in the Qualitative Analysis Review[88] show that the HCPs will fall short of what is needed for survival and recovery under the ESA, and that therefore it is unreasonable not to

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[86] CRITFC protest at 4, 6.

[87] CRITFC EIS comments at 4-7, Yakama protest at 4. Yakama cites NOAA Fisheries' salmon recovery policy, which includes as goals the restoration of salmon populations to the point where they can be delisted and allow for the meaningful exercise of tribal fishing rights. Yakama protest at 4. CRITFC indicates that its objective is to have naturally-reproducing stocks supplemented by hatchery production until restoration measures result in a harvestable surplus of naturally-reproducing fish. In contrast, it states, NOAA Fisheries contemplates separate stocks of naturally-reproducing and hatchery fish, with tribal harvest directed to the hatchery stocks. CRITFC EIS comments at 4-5.

[88] NOAA Fisheries' Qualitative Analysis Review developed population models for Upper Columbia River spring-run Chinook salmon and steelhead. It modeled a range of alternative future survival improvements for Upper Columbia River stocks, including improvements that could be expected from implementing the HCP measures. The Qualitative Analysis Review is discussed in detail in EIS Chapter 5. See EIS at 5-7 to 5-20.

consider at least one alternative that will meet that standard.[89] They state that such an alternative could include survival improvements through changes to operation of the Federal Columbia River Power System, egg-to-smolt survival increases from habitat improvements, or increases in ocean survival.

67. The licensees respond that the Qualitative Analysis Review was a draft that was never finalized, and that used data ending in 1994. The updated model used for the EIS included 1995 and 1996 data, and the latter analysis shows that the HCP measures should ensure against extinction.[90]

68. Such actions as improvements to the the Federal Columbia River Power System or unspecified actions to increase ocean survival are not reasonable alternatives to the HCPs. First, such broad-brush suggestions are too vague to allow credible analysis. Moreover, we have no authority over the operations of the Federal System, or control over human activities that might affect ocean survival, such as harvest. In any event, to the extent such actions are taken by other non-jurisdictional entities, we view them as complementary, rather than as alternatives to, the HCPs.

69. CRITFC and Yakama[91] state that because neither action alternative includes full consideration of such measures as sluiceways, reservoir drawdown, or increased spill, they do not meet the requirement of ESA section 10(a)(2)(B)(ii) for HCPs "to the maximum extent practicable, minimize and mitigate the impacts of [a permitted]

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[89] See CRITFC EIS comments at 10, citing the EIS at C-5 and C-39 to the effect that the HCPs alone will not recover the listed species. CRITFC evidently believes that HCP measures such as habitat improvements will be insufficient because the direct and delayed impacts of the entire Columbia River basin hydroelectric system explain the majority of impacts to salmon stocks. See CRITFC EIS comments at 7.

[90] Joint response at 2.

[91] CRITFC EIS comments at 6-7; Yakama protest at 9-10.

taking."[92] CRITFC states that the EIS explains that such measures are not included in the HCPs because none of them would alone lead to species recovery, and asserts that an alternative should have been developed using a combination of such actions.[93]

70. The EIS explains that elements of these measures have been included in the two action alternatives where appropriate, and describes the negative aspects of these measures that make them less effective than the HCPs. For instance, spill is the primary measure to pass juvenile fish at Rock Island, currently and under the HCP, and is also a component of the Wells bypass system, but it has not been effective at Rocky Reach. Seasonal reservoir drawdown was not given full consideration, because although it has been found to correlate with increased migration rates for sockeye and steelhead, that correlation does not hold for chinook and coho salmon, and there is no consistent relationship between flows and survival for most species.[94]

71. Yakama and CRITFC state that the EIS should also contain an alternative based on the assumption that no net impact is not achieved, in which case the Commission should require compensation for the resulting loss of fish and for fish losses between implementation of the HCPs and the scheduled achievement of no net impact in 2013.[95] CRITFC considers this a reasonable alternative, because failure of any of the three HCP components (dam-passage improvements, habitat improvements, and long-term hatchery production programs) will result in failure of the entire effort.[96]

72. We think it unreasonable to develop a hypothetical alternative that assumes the HCPs will fail. Moreover, the possibility that no net impact will not be met on schedule is specifically provided for in HCP section 5, which contemplates additional measures to

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[92] 16 U.S.C. § 1539(a)(2)(B)(ii).

[93] Citing the EIS at pp. 2-69 to 2-73.

[94] See EIS at pp. 2-69 to 2-72.

[95] Yakama protest at 5; CRITFC EIS comments at 14.

[96] CRITFC EIS comments at 7.

be undertaken if the survival standards are not met. Any alternative we developed along these lines would be redundant. Compensation for fish losses is addressed below.

73. Finally, CRITFC and Yakama attack the no-action alternative on the ground that it fails to correctly represent the actions that may be taken to protect the plan species under the settlement agreements currently in place or the existing coordinating committees.[97] CRITFC states that the Rocky Reach permanent juvenile fish passage system, which was approved in 2002,[98] should be considered part of the existing baseline instead of part of the HCP alternative. Yakama contends that the no-action alternative should include discussion of the agency statutory authorities at relicensing, particularly relative to Rocky Reach, and more fully discuss the Mid-Columbia settlement agreements and the work of the existing coordinating committees.[99] Failure to include these elements in the no-action alternative, asserts Yakama, causes the EIS to inadequately consider Yakama's interests.[100]

74. We conclude that the no-action alternative is appropriately described in the EIS.[101] Although the Rocky Reach permanent juvenile fish bypass system was approved in April 2002 prior to issuance of the Final EIS in December 2002, construction was not completed until March 30, 2003, so its existence cannot reasonably be said to reflect existing conditions when the environmental analysis was prepared.

75. Nor do we agree that the future exercise of agency conditioning authorities at relicensing can be included in a description of existing environmental conditions. These authorities are not exercised until the relicense applications have been filed, accepted, and found ready for environmental analysis. We cannot say when that will occur, even for Rocky Reach, let alone predict how this Commission or NOAA Fisheries might exercise

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[97] Yakama protest at 16; CRITFC protest at 16.

[98] 99 FERC ¶ 61,059, reh'g denied, 100 FERC ¶ 61,216 (2002).

[99] Yakama protest at 16-17.

[100] CRITFC EIS comments at 13.

[101] See EIS at p. S-4 and pp. 2-31 to 2-38.

its authorities. Finally, the EIS describes in adequate detail the existing and planned measures for anadromous fish under the existing licenses, as amended in the context of the Mid-Columbia proceeding.[102]

4. Technical Analysis

76. An EIS must contain "'[a] reasonably thorough discussion of the significant aspects of the probable environmental consequences.'"[103] This standard has been characterized as requiring the action agency to take a "hard look" at the proposed action and reasonable alternatives."[104] CRITFC and Yakama assert that the EIS fails to meet this requirement in various respects.

77. In addition to a general coordinating committee, each HCP establishes committees for tributary conservation and hatchery compensation programs. Membership on these committees is limited to the parties. CRITFC asserts that additional environmental analysis is required, because the EIS was premised on the assumption that Umatilla and Yakama would be parties to the agreements and members of the committees. CRITFC contends that their absence from these committees will result in different environmental impacts than those identified in the EIS, because Umatilla and Yakama are co-resource managers who play a leading role in the recovery of the Columbia River anadromous fisheries.[105] Yakama similarly states that the EIS must analyze the effects of terminating the Mid-Columbia proceeding and thereby excluding Yakama for the next 50 years from the role it currently plays in resolving anadromous fishery issues.[106]

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[102] See EIS at pp. 2-31 to 2-38.

[103] PP&L Montana, LLP, 97 FERC & 61,060 (2001), citing Columbia Land Basin Protection Assn. v. Schlesinger, 643 F.2d 585, 592 (9th Cir. 1981), quoting Trout Unlimited v. Morton, 509 F.2d 1276,1283 (9th. Cir. 1974).

[104] See Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1990).

[105] CRITFC EIS comments at 4, 13.

[106] Yakama protest at 8.

78. It is possible that the details of specific actions taken to meet the no-net-impact goal would be different if Umatilla and Yakama were on the various committees, but the numerical standards would remain the same. More important, an alternative must be reasonably well articulated in order for it to be analyzed. CRITFC and Yakama cannot explain how the HCPs would be differently administered or how management of the Columbia River's anadromous fishery would change, were they represented on the various committees, since they cannot speak to what differently-constituted committees might decide.[107]

79. CRITFC argues that the EIS lacks sufficient quantitative detail on how listed species would be affected by the HCPs or other alternatives. It notes that the EIS mentions the Qualitative Analysis Review but does not incorporate the Review's analysis into the comparison of alternatives, making it impossible to tell how each of the alternatives compares with the others in terms of survival and rebuilding.[108]

80. We think it is unreasonable to expect the EIS to include predictive quantitative data at the level of detail CRITFC appears to expect. The HCPs are based on the premise that a combination of measures, some of which are yet to be determined, will be taken in order to meet the applicable standards, and that their effectiveness will be measured. If the measures initially selected do not cause the standards to be met, other measures as yet undetermined will be taken until the standards are met or are determined to be impossible to meet. Under these circumstances, the appropriate focus is not on producing detailed future population estimates, but on whether the approach to the problem is sound. We think the HCP approach is likely to be successful, because it does not depend on a single component, all the components are likely to have beneficial effects, and it requires the parties to meet the numerical standards unless it is determined that they are impossible to meet.

[107] The decision of CRITFC and Yakama not to participate in the HCPs for these three projects has no bearing on their participation in fisheries management efforts at Priest Rapids or for the Federal System.

[108] CRITFC EIS comments at 5-6.

81. CRITFC contends that the EIS is too focused on whether the HCPs meet ESA standards, and includes no clear analysis of whether they satisfy other applicable legal standards. [109] CRITFC mentions in general tribal treaty fishing rights, no net impacts, the relicensing standards of the FPA, the Fish and Wildlife Coordination Act,[110] Pacific Northwest Electric Power Planning and Conservation Act,[111] Magnuson-Stevens Act,[112] and Title 77 of the Regulatory Code of Washington.[113]

82. Although an environmental analysis includes identification of laws and policies that apply to the proposed action and alternatives,[114] its purpose is not to determine if applicable legal requirements have been satisfied, but to compare the environmental impacts of a recommended action with reasonable alternatives. The EIS does that.

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[109] CRITFC EIS comments at 6, 9, 10, 11-13. CRITFC also suggests that the Commission should determine if the HCP satisfies NOAA Fisheries' "obligations under sections 18, 10(a), 10(j) of the [FPA]." CRITFC EIS comments at 9. We see no inconsistency between the HCPs and these sections of the FPA.

[110] 16 U.S.C. § 661 et seq.

[111] 16 U.S.C. § 839 et seq.

[112] 16 U.S.C. §§ 1801-1883.

[113] Revised Code of Washington, Title 77.

[114] See EIS section 4.13.

Whether the HCPs satisfy applicable legal requirements is a matter for NOAA Fisheries and the Commission to determine in the context of orders acting on the applications before them. We consider these matters at appropriate places in this order.[115]

83. American Rivers asserts that because the HCPs have 50-year terms and are intended to address substantially all of the anadromous fish issues at the projects, and because the parties assert that the agreements will meet the legal obligations of the signatory agencies for purposes of future relicense proceedings,[116] the Commission must evaluate the license amendment applications pursuant to the same standards that would apply to an application for a new license, i.e., must consider all aspects of the public interest affected by the applications and give equal consideration to power development and non-power resources. American Rivers states that the EIS fails in this regard because it addresses only those aspects of the public interest related to anadromous fish.[117]

84. Chelan responds that the standard for Commission review of these applications is different from the standard applicable to relicensing, because a license amendment application is subject only to the public interest standard of FPA section 10(a)(1), while a

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[115] See, e.g., section VII (Magnuson-Stevens Act). CRITFC does not explain what provisions of the Northwest Power Act it believes apply to the HCPs, or what role the Commission might have in that regard.

Title 77 RCW includes broad-ranging provisions in 24 chapters pertaining to all aspects of fish and game regulation in Washington State. Rocky Reach and Rock Island HCP section 9.5 (Wells 9.8) provides that if the licensee is in compliance with the HCP, ITP, and its license, Washington DFW will not request additional measures under Title 77 RCW. Because the FPA preempts state laws with respect to licensed projects other than state regulations enacted pursuant to federal legislation such as the Clean Water Act, a licensee may voluntarily comply with state laws only so long as such compliance does not interfere with its compliance with the federal license. See California v. FERC, 495 U.S. 490 (1990).

[116] Citing Rocky Reach and Rock Island HCP section 9.2.2; Wells HCP section 9.5.2.

[117] American Rivers protest at 3.

relicense application is subject, in addition to section 10(a)(1), to FPA section 15[118] and to potential agency recommendations pursuant to FPA section 10(j) and mandatory conditions pursuant to FPA sections 4(e)[119] and 18.[120]

85. Although every change to a license is an amendment, not all amendments trigger the full panoply of rights and procedures applicable to a license application proceeding, such as sections 10(j), 18, and 4(e). Amendments that do trigger these sections are called "licensing amendments." A licensing amendment authorizes a significant new project work, such as a new turbine/generator, an increase in the height of the project dam, or the like.[121] Non-licensing amendments make minor modifications to project lands, waters, or operations that implicate only limited aspects of the overall public interest with respect to the project.[122]

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[118] 16 U.S.C. § 808.

[119] 16 U.S.C. § 797(e).

[120] 16 U.S.C. § 811.

[121] See e.g., PUD No. 1 of Chelan County, 55 FPC 2050, 2053 (1976) (increase in installed capacity); Fieldcrest Mills, Inc., 37 FERC & 61,264 at 61,762 n.6 (1986) (installed capacity quintupled; new forebay, powerhouse and tailrace); Adirondack Hydro Development Corp., 50 FERC & 61,100 at 61,318-20 (1990) (substantial capacity increase, dam raised, reservoir surface increased, new powerhouse, twelve turbines small turbines replaced by one large turbine). See also Allegheny Hydro No. 8, L.P., 49 FERC & 61,277 (1989); Nevada Irrigation District, 46 FERC & 61,146 at 61,467 (1987); Cordova Electric Cooperative, Inc., 91 FERC 61,243 (2000) (all adding a new transmission line).

[122] See, e.g., Virginia Electric and Power Co., 72 FERC & 61,075 (1995), reh'g denied, 72 FERC & 61,283 (1995) (diversion of small portion of river flow from project reservoir to municipal water supply pipeline); Carolina Power & Light Co., 94 FERC & 61,203 (2001) (replacement of existing water intake and pumping station to increase withdrawal capacity for municipal and industrial water supply).

86. The HCP applications are not licensing amendments. They are clearly limited in scope, and have negligible impact on other aspects of the projects that may be part of the relicensing analysis, such as irrigation, flood control, water supply, and recreation. Chelan is also correct that the HCPs have negligible or tangential bearing on various subjects required to be considered on relicensing by FPA section 15(a)(2), such as project safety, need for power, and existing and planned transmission services.

87. CRITFC also states that the EIS is deficient because it does not recognize that the wealth of the river has been transferred from tribal to non-tribal citizens, and that Indian tribes have higher rates of poverty and mortality from the loss of salmon than do non-tribal citizens.[123] The history of the river system's use and development over the last century is far too broad a topic for the limited purposes of analyzing applications to add an HPC to each of three project licenses, nor does the Commission have the authority to cure the adverse effects cited by CRITFC. However, since we conclude that the HCPs are likely to be an important element in the recovery of listed Columbia River salmonids, the grant of the amendment applications can only be beneficial for Native Americans and others.

88. CRITFC also believes that the cumulative impacts analysis is inadequate because it does not treat the HCPs as precedent for future Columbia River hydropower management at other dams, such as Wanapum and Priest Rapids, and examine the effects on salmon if the HCPs were applied to the operation of those dams.[124] We cannot assume that an HCP will be developed for Priest Rapids, much less speculate about what specific provisions such an agreement would contain. If a Priest Rapids HCP is developed, it will be subject to the same legal and policy requirements that apply to the HCPs under consideration here.

89. Cumulative impacts are the environmental consequences resulting from the incremental effects of the action alternative when added to other past, present, and reasonably foreseeable future actions, regardless of the entity that undertakes or undertook those actions.[125] Yakama asserts that the EIS cumulative impacts analysis is

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[123] CRITFC protest at 7.

[124] CRITFC EIS comments at 8.

[125] See 40 C.F.R. § 1508.7.

deficient because it does not consider factors contributing to the decline of the listed species throughout the entire life history of each species, including effects beyond the geographic scope of the analysis. It adds that the EIS should have considered the impacts of the Federal Columbia River Power System operations and all five of the Mid-Columbia dams, and that NOAA Fisheries' Qualitative Analysis Review model appears to assume that operational requirements at the federal dams are unenforceable, which would undercut the effectiveness of the HCP measures.[126]

90. There is no dispute that the Columbia River salmonid fishery has been negatively affected by federal and non-federal dams and a host of other factors, but there is no need in this proceeding to revisit that entire history. The EIS includes a discussion of other federal, regional, state, and tribal programs for salmonid recovery that address the factors which have contributed to the existing state of the fishery.[127] We conclude that the EIS appropriately addresses this issue.

91. CRITFC objects to the fact that the HCPs do not provide for compensation for losses to listed species if the projects fail to meet the no-net-impact standard on schedule, and states that this is an "exemption" not contemplated by the ESA or FPA, the environmental impacts of which must be examined.[128] It is of course possible that one or more of the projects will fail to achieve no net impact for any listed species on schedule. It is not possible, however, to analyze the environmental impacts of such an event without making many assumptions about the degree of non-compliance and the specific implementation measures to be determined by the committees in order to achieve no net impact. Any such assumptions on our part would amount to no more than speculation.

92. Finally, CRITFC states that the EIS does not analyze the effect of the HCP alternative on tribal water rights. In this connection, it appears to assert that the tribes

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[126] Yakama protest at 15.

[127] See EIS section 5.

[128] CRITFC EIS comments at 9.

have a right to spill water in order to provide fish passage.[129] Chelan replies that the Tribes have treaty rights to take fish at their usual and accustomed fishing places, but no right to spill at any of the projects by treaty or otherwise.[130] Although the 1855 Treaty with the Yakama[131] and court cases cited by CRITFC establish that the treaty tribes have the right to continue traditional fishing practices[132] and to an equitable share of the Columbia River fish,[133] CRITFC has not shown that there is a tribal right to spills, or to any other specific measure to ensure the continued existence of a harvestable fishery.

H. Merits of the HCPs

1. Term of the HCPs

93. Yakama contends that the 50-year term of the HCPs is too long and is not contemplated by ESA section 10. If long-term permits are lawful, Yakama contends that the incidental take permits should have project-specific time frames for achieving no net impact, and ESA protection for several generations of salmon thereafter.[134]

94. ESA section 10 places no limit on the term of a take permit or HCP, and Yakama does not explain why the project-specific no-net-impact schedules are not appropriate.[135]

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[129] CRITFC protest at 7.

[130] Chelan answer to CRITFC at 8.

[131] 12 Stat. 951, Art. 3 (June 9, 1855).

[132] Tulee v. Washington, 315 U.S. 681, 684-85 (1942).

[133] Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658, 674-89 (1973).

[134] Yakama protest at 3.

[135] As noted above, Rocky Reach and Rock Island are to achieve no net impact by 2013, and Wells by 2018.

Nor do we understand Yakama's argument that the take permits should provide ESA protection for several generations of salmon. As discussed above, the HCPs require the licensees, once they have achieved no net impact, to maintain that status for the remaining term of the ICPs, which is another 40 years or so. This clearly includes several generations of salmon.

2. Scope of the Plans

95. CRITFC states that the HCPs should be disapproved because they do not address anadromous fish survival and recovery from an ecosystem and life-history perspective, but merely measure juvenile fish survival from one point to another point. They add that the HCPs should holistically address water quality standards, fish passage, and restoration of critical habitat.[136]

96. The licensees respond that an ecosystem approach was deemed by the HCP negotiators to be too complex; the HCPs meet the criteria of the ESA regulations for take permits by conserving fish habitat; and the HCPs are intended to help meet the goals of recovery and a self-sustaining harvestable population by meeting the no-net-impact standard.[137] They state that the HCPs acknowledge the importance of water quality objectives and provide that the parties will work together to address water quality problems.[138]

97. We do not find the HCPs deficient in this regard. The passage-survival standards, tributary enhancement and hatchery compensation plans, and reservoir habitat and water quality provisions will be implemented under the guidance of the committees, which will have representation from each party. We are confident that these parties, working together, will implement the HCPs in a manner that makes a significant contribution to

[136] CRITFC protest at 4-5.

[137] Chelan answer to CRITFC at 9; Douglas answer at 9.

[138] Chelan answer to CRITFC at 9, citing Rocky Reach HCP section 6.3; Douglas answer at 9-10, citing Wells HCP section 5.3. Chelan adds that when it constructed the permanent juvenile bypass facility at Rocky Reach, it obtained water quality certification from Ecology. Chelan answer to CRITFC at 9-10.

the recovery of the listed species and to keeping the non-listed species from becoming listed.

3. Delayed Mortality

98. CRITFC also complains that the HCPs fail to address project-related mortality that occurs beyond the project boundaries (delayed mortality).[139] Chelan disputes this, stating that the survival standards in each HCP include measurement of delayed mortality.[140] The licensees add that survival studies conducted at the projects from 1998-2003 in connection with the HCPs rely on recapture information at federal dams hundreds of miles downstream, and that the HCP parties agree that the survival standards include any delayed mortality resulting from passage at the projects.[141] We find no deficiency in this regard.

4. Water Quality

99. CRITFC also faults the HCPs for not addressing elevated levels of dissolved oxygen and resulting delayed mortality from gas-bubble disease caused by spillage from turbine shutdowns or uncontrolled high flows, and increased predation on downstream migrants due to the loss of natural turbidity. It adds that the HCPs should include structural remedies, such as the introduction into fishways of cooler water from lower reservoir depths, to address elevated water temperatures compared to historical (i.e., pre-project) levels.[142] Chelan responds that temperature and dissolved gas issues are being addressed elsewhere, and that because these projects operate in a run-of-river mode they do not have the temperature stratification that would make a structural resolution of temperature issues possible.[143]

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[139] CRITFC protest at 4.

[140] Citing HCP section 13. See, e.g., Wells HCP section 13.14.

[141] Joint response at 4-5.

[142] CRITFC protest at 5.

[143] Chelan answer to CRITFC at 12.

100. It is not necessary to provide specific measures in the HCPs for water quality. The licensees are voluntarily complying with the Washington state water quality standards for temperature and dissolved oxygen[144] in the context of the federal fish passage programs for the Columbia River. The projects are located reaches of the river that Ecology has determined are water-quality impaired in that DO and water temperature sometimes exceed the state standards. Ecology has however granted approval to spill, thereby allowing slight exceedances of the dissolved oxygen standard, and is developing total maximum daily loads for the specific water-quality parameters that exceed the standards.[145] The EIS also finds that the Mid-Columbia projects have very rapid flushing rates that limit the potential warming that can occur due to their operation, and that water temperatures are not significantly warmed by the projects.[146]

5. No Net Impact

101. CRITFC and Yakama state that the no-net-impact concept is flawed because the measurement and protection measures provided in the HCPs require the protection of only 95 percent of the run for each plan species, instead of the 100 percent assumed in the Draft EIS.[147] They assert that failure to provide full protection for the beginning and end portions of each run could select against important genetic diversity and fitness necessary for species recovery.[148] CRITFC adds that there is no provision for replacement of fish lost during the portion of the run to which the standard does not apply,[149] or for fish lost

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[144] Washington Administrative Code Chapter 173-201A.

[145] EIS section 3.3.2, in particular discussion at pp. 3-113 to 3-115.

[146] EIS at p. 3-116.

[147] This means that the standard will only apply 95 percent of the time that the run is occurring. In essence, the standard does not apply during the first and last several days of the run.

[148] CRITFC protest at 7.

[149] Yakama protest at 4; CRITFC EIS comments at 10.

between now and when it is determined if the Rocky Reach permanent juvenile bypass system will enable that project to attain the survival standards. Douglas responds that the HCP negotiators agreed that it was impractical to try to encompass 100 percent of the run.[150]

102. We agree that it is impractical to try to encompass 100 percent of the run, because that would require spill to occur throughout the year, as salmonids are in the system year-round. Since 95 percent of the run of all downstream migrants can be encompassed in the April-through-September period, it makes sense to concentrate efforts during this period. It should be noted as well that the vast majority of the remaining five percent of fish are not lost, but rather navigate over the dams or through the turbines without the safety measures provided for in the HCPs. The mortality rate for such fish is about eight percent.

103. CRITFC adds that there is no evidence that the tributary compensation plan will result in a two-percent increase in smolt production to compensate for project-related mortality. It states that two percent is a negotiated figure intended to cover the gap between the seven-percent hatchery mitigation figure and the 91-percent survival standard.[151] The licensees respond that it was understood by all parties to the negotiations that a two-percent increase in smolt production cannot be measured, and that the habitat improvement projects funded with the assistance of the tributary committee will also benefit other species, such as bull trout and Pacific lamprey.[152]

104. The fact that the two-percent figure was negotiated does not make it unreasonable. Smolt production in the tributaries is not something that can be measured with precision. It is however logical to assume that improving the tributary habitat will have a beneficial effect on salmonid production. In any event, the habitat enhancements are being relied upon to compensate for the loss of only two percent of the plan species, so the ultimate success of the HCP will depend only slightly on the effectiveness of this measure.

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[150] Douglas answer at 12.

[151] CRITFC EIS comments at 10.

[152] Joint answer at 6-7.

105. Yakama and CRITFC state that the seven-percent hatchery mitigation component is uncertain, because NOAA Fisheries is not prohibited from closing the hatchery program;[153] hatchery fish used for testing may have a higher mortality rate than other hatchery fish; and there is no provision for compensation for fish lost between the beginning of additional hatchery production under the HCP and the ultimate determination of whether this measure is having the intended effect, or that other measures will be as effective as hatcheries.[154].

106. The HCPs do not provide for discontinuation of the hatchery program. Rather, they include a monitoring and evaluation plan for the hatchery program that is updated every five years and includes a program review.[155] This could result in changes to hatchery production levels every ten years, based on specific indicia.[156] Any such changes evidently must comply with the 7-percent hatchery compensation requirement, unless NOAA Fisheries proposes hatchery policy changes that would preclude the 7-percent level from being achieved. Any proposed changes that would have that effect must be submitted to the Hatchery Committee, be subject to the dispute resolution provisions, and be consistent with the principle of no net impact.[157] Under these conditions, we see no need to modify the HCPs to guarantee that the hatchery program will never be modified or discontinued. Finally, ESA section 10 does not require compensation for every fish lost as a result of project operations. So long as the projects are operated under the terms of the HCPs as approved in the take permits, incidental mortality is a permissible take.

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[153] The hatchery programs are subject to periodic review and modification beginning in 2013. HCP section 8.

[154] Yakama protest at 4, 10; CRITFC EIS comments at 13.

[155] See, e.g., Rocky Reach HCP sections 8.5 and 8.6.

[156] See, e.g., Rocky Reach HCP section 8.4.3, which provides for adjustments based on changes in average adult returns, adult-to-smolt survival rates, and smolt-to-adult survival rates from hatchery production facilities.

[157] See, e.g., Rocky Reach HCP section 8.8.

107. The HCP nine-percent mitigation component assumes a two-percent loss of adult fish due to project operations. Yakama and CRITFC state that this figure is speculative, because there are no quantitative measurements of actual adult losses, the 2000 Biological Opinion indicates that adult passage mortality may be as high as four percent, and the HCPs have no passage standards (e.g., for passage time, [158] fallback rates, [159] and downstream kelt[160] passage).[161] Yakama states that these unmeasured and unknowable losses may skew the no-net-impact calculation, and that therefore the EIS should discuss, and the HCPs include, measures and passage standards to increase adult passage survival.

108. The licensees reply that the two-percent standard applies only to hydroelectric project effects, and that there is natural mortality unrelated to project effects, for which the licensees are not, and should not be, held responsible. They state that adult passage standards are not needed, since the HCP has survival standards.[162]

109. It is possible that the adult mortality rates, whether project-induced or natural, exceed the assumed two percent. However, the weight of the available data appears to favor that figure.[163] What is important is that meeting the no-net-impact standard should ensure recovery of the plan species, and if the standard is not timely met, Phase II of the implementation plans provides for the licensees to undertake additional measures in order to meet that standard.

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[158] Passage time refers to the time required for fish to migrate either upstream or downstream.

[159] Fallback occurs when adult fish migrating upstream fall back through the project instead of continuing upstream past the dam.

[160] A "kelt" is an adult steelhead that has survived spawning and is actively migrating downstream in order to return to the ocean.

[161] Yakama protest at 11; Yakama July 29 letter at 12; CRITFC protest at 6; CRITFC EIS comments at 8.

[162] Chelan answer to CRITFC at 11; Douglas answer at 11.

[163] EIS at p. 2-51.

6. Committee Membership

110. CRITFC also appears to object to the inclusion of the licensees on the tributary and habitat committees, on the ground they the licensees' interests are not those of the tribes. CRITFC also asserts that NOAA Fisheries cannot represent the tribes' interests, because it has not adopted the tribal goal of a sustainable, harvestable fishery.[164] We understand that the interests and goals of the licensees and the federal and state agencies are not necessarily those of the tribes. If the tribes choose to sign the HCPs, they can be assured of a voice on the committees that will implement the HCPs.

7. Dispute Resolution

111. HCP section 11 establishes a two-stage dispute resolution regime. In the first stage, disputes are referred to the tributary or hatchery committee or, if neither is applicable, the coordinating committee. If a dispute is not resolved by the coordinating committee, it is referred to the policy committee. Unresolved disputes originating with the tributary or hatchery committee must be referred to the coordinating committee before they may be referred to the policy committee. The tributary, hatchery, and coordinating committees are to act within 20 days. The policy committee must act by unanimous vote, and does not appear to have a clear time limit for final action on the dispute. Section 11 provides that if a dispute is not resolved, then "any Party may pursue and other right they might otherwise have."[165]

112. Yakama asserts that the dispute resolution mechanism is not workable or enforceable, because it relies entirely on consensus and provides no avenue for judicial relief where consensus is not achievable. It states that this will lead to decision by paralysis, or the use of inaction during critical periods as a means of forcing concessions from unwilling participants.[166] CRITFC adds that the delays built into section 11 will

[164] CRITFC EIS comments at 4-5.

[165] HCP section 11.1.3.

[166] Yakama protest at 4-5.

prevent NOAA Fisheries from timely exercising its authorities and the Commission from using reopener clauses as oversight.[167]

113. We interpret the statement in section 11.1.3 that "any Party may pursue any other right they might otherwise have" in the event of an unresolved dispute to include resort to the standard fish and wildlife reopener clause in each license.[168] In this regard, the HCPs state[169] that the parties may not invoke the reopener provisions "for the purposes of obtaining additional measures or changes in project structures or operations for Plan Species. . . ," except under limited circumstances specified in the HCPs.[170] We interpret this to mean that the reopener provisions may be invoked for the purpose of resolving disputes pertaining to implementation of measures provided for in the HCPs, as opposed to measures not contemplated by these agreements.[171]

114. Also, the Commission may on its own motion use its reserved authority to reopen a license to address concerns about the implementation of the HCPs. Moreover, the agreement in HCP section 9 not to institute any action under the ESA, FPA, or other

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[167] CRITFC EIS comments at 9. CRITFC also states that the EIS should have examined the environmental impacts of delays caused by section 11's mechanisms. Id. We are not able to determine the environmental impacts of hypothetical future disputes.

[168] Standard-form fish and wildlife reopener articles are incorporated by reference in all the licenses. See Rock Island license, ordering paragraph (E), 46 FERC ¶ 61,033 at 61,208; Rocky Reach license, ordering paragraph (B), 18 FPC 33, 35; and Wells license, Article 41, 28 FPC 128, 134.

[169] Rocky Reach and Rock Island HCPs section 9.3; Wells HCP section 9.6.

[170] The HCPs reserve the rights of NOAA Fisheries and FWS to use section 18 if an HCP is terminated, or to request the inclusion in the license of plan species protection measures contained in a competing license application. Rocky Reach and Rock Island HCPs section 9.3; Wells HCP sections 9.5.2 and 9.5.3.

[171] See Rocky Reach and Rock Island HCP section 9.7; Wells HCP section 9.10. We express no opinion on how these provisions might affect the exercise by NOAA Fisheries of its authorities under the ESA.

legislation applies only so long as the licensee is in compliance with the take permit, HCP, and Commission license.[172] No party is restrained from making an allegation of non-compliance. Finally, these provisions are binding only on the parties, and so will have no effect on Yakama and Umatilla if they decline to execute the HCPs.

115. Finally, we think Yakama and CRITFC are unduly concerned that the HCPs will continue in place unchanged even if they fail to achieve their purpose. The HCPs provide that any party may withdraw if no net impact is not achieved on schedule; is achieved but not maintained; or is achieved and maintained, but the plan species are not rebuilding, and the project is a significant factor in the failure to rebuild.[173] A party that withdraws from the HCP is free to invoke any applicable reopener clause.

8. No-Surprises Policy

116. In a related vein, CRITFC and Yakama object to the no-surprises concept incorporated into the section 9 of the HCPs, on the ground that they rob the Commission of its ability to use reopener provisions to ensure compliance with the license.[174] As noted above, the Commission is not precluded from exercising its authority under any reopener clause.

9. Sturgeon and Pacific Lamprey

117. CRITFC states that the HCPs violate the Commission's trust responsibility because they do not cover sturgeon or lamprey,[175] and that passage facilities provided for

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[172] Rocky Reach and Rock Island HCPs section 9.1.2; Wells HCP section 9.4.2.

[173] HCP section 2.1.

[174]. CRITFC EIS comments at 9; Yakama protest at 7.

[175] CRITFC protest at 5. A petition to have Pacific lamprey listed as threatened or endangered was filed with the FWS by numerous environmental organizations on January 28, 2003. FWS has not yet acted on the petition.

under the HCPs, such as turbine intake screens, may select against sturgeon or lamprey.[176]

118. As noted, the licensees dispute CRITFC's assertion that off-reservation sturgeon and lamprey are trust resources. They add that the Mid-Columbia proceeding is in any event not concerned with those species, and that the appropriate forum for issues pertaining to those species is future relicense proceedings.[177]

119. Whether or not sturgeon or Pacific lamprey are "trust resources," the purpose of the HCPs is to ensure compliance with the ESA regarding federally-listed salmonids and to prevent other Mid-Columbia salmonids with similar habitat and passage characteristics from becoming listed. The only indication that project operations may affect either sturgeon or Pacific lamprey is a non-specific citation to a single study which CRITFC states shows evidence of lamprey impingement on turbine screens.[178] The licensees respond that project impacts to lamprey are minimal, because the juvenile bypass system at Wells does not use turbine intake screens and cannot impinge lamprey; there are no intake screens at Rock Island; and test results at Rocky Reach indicate that lamprey travel at extreme depths, while the turbine screens (which are currently placed on only two of the eleven turbines) have a short depth designed to guide fish using the upper section of the turbine intakes.[179] Moreover, the EIS acknowledges that turbine intake screens may impinge juvenile lamprey, but notes that the tributary habitat projects are expected to benefit lamprey spawning and rearing.[180] Under these circumstances, we see no need for the HCPs to address these species. CRITFC may raise issues pertaining to lamprey and sturgeon in relicense proceedings.

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[176] Yakama motion to intervene at 4; CRITFC motion to intervene at 5..

[177] Chelan answer to CRITFC at 8; Douglas answer at 8-9.

[178] CRITFC motion to intervene at 5 n.3.

[179] Joint response at 6.

[180] EIS at 4-49.

10. Mid-Columbia Coordinating Committee

120. The Mid-Columbia Coordinating Committee (MCCC) was formed in the Commission's Mid-Columbia proceeding (discussed above) to manage studies and interim protection for all the Mid-Columbia projects. Yakama charges that approval of the HCP would constitute a refusal to let Yakama participate in the MCCC, and alleges that NOAA Fisheries and FWS have refused to allow Yakama to participate in that body for almost a year. Yakama also objects to termination of the Mid-Columbia proceeding with respect to Rocky Reach, on the ground that its participation in the MCCC is necessary for protection of its treaty rights.[181]

121. The licensees dispute that they have precluded Yakama from participating in the MCCC. They add that since the Wells and Rock Island Agreements were approved and those projects were excluded from the Mid-Columbia proceeding, the requirements of those agreements have been administered by the Wells and Rock Island coordinating committees. Yakama, they state, is a party to both agreements, and accordingly is a member of both committees.[182]

122. Chelan states that the HCP Coordinating Committee (HCPCC) decided in early 2003 that issues related to early implementation of the HCPs (i.e., voluntary implementation prior to receipt of all necessary approvals) and spill at its projects would be handled by the HCPCC, and that any decisions by the HCPCC would be taken to the MCCC and Rock Island committees for discussion. It states that CRITFC has participated in such meetings. Douglas adds that Yakama has not been excluded from,

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[181] Yakama protest at 7-8. Yakama also alleges that its exclusion from the HCP Committees unless it executes the HCPs violates Secretarial Order No. 3206, "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act." This order, which was issued jointly by the Secretaries of Commerce and the Interior on June 5, 1997, as amended, clarifies the responsibilities of the component agencies, bureaus, and offices when they take action that affects tribal interests. Section 2 states that the order is "for guidance within the Departments only." Because Order No. 3206 does not apply to this agency, we express no opinion regarding Yakama's allegations.

[182] Chelan answer to CRITFC at 6-7; Douglas answer at 5-7.

and has been attending, meetings of the Wells coordinating committee.[183] Douglas adds that Yakama is not entitled to attend HCPCC meetings, because it has not signed the HCP, and that in any event the Wells HCP provides that it will only be implemented upon approval by the Commission. Until then, all decisions concerning the fishery and Wells will continue to be made under the auspices of the Wells committee.[184]

123. We conclude from the licensees' responses that they have not attempted to exclude CRITFC or Yakama from participating in the various Mid-Columbia River fisheries committees established pursuant to Commission license requirements. As to the MCCC, we note that the Mid-Columbia proceeding has already been terminated with respect to Wells and Rock Island, but that the MCCC has continued to exist and to meet with participation of these licensees. With the approval of the Rocky Reach HCP, we will also terminate the Mid-Columbia proceeding as to that license. Thus, the Mid-Columbia proceeding will remain open only for Grant's Priest Rapids Project. We nevertheless expect the MCCC to continue to function as a forum for coordination and discussion among the interested entities of issues common to the Mid-Columbia River Basin.

124. CRITFC states that the trust responsibility requires tribal input into the management of trust resources, and that the HCPs violate that responsibility by preventing the tribes from co-managing the plan species unless they sign the HCPs.[185] As noted above, the Commission carries out its responsibilities under the FPA and other statutes with full recognition of tribal treaty and statutory rights. We agree that tribal participation in the management of the Columbia River fishery is consistent with those rights, but we also conclude that it would not be in the public interest to allow the tribes to participate in the HCPs unless they are bound by the same rules of participation as all other signatories.

[183] Douglas states that during the past two years Yakama has attended twelve, and CRITFC three, Wells coordinating committee meetings.

[184] Douglas answer at 5-7.

[185] CRITFC EIS comments at 13.

11. Release from Claims

125. Finally, HCP section 9 provides that the parties release the licensees from all claims concerning project impacts on the plan species, except for the obligations with respect to fish hatcheries.[186] Yakama urges us to strike this provision on the ground that it is inappropriate in the context of the ESA or FPA, or not permitted by NEPA, the ESA, and the FPA.[187]

126. Nothing in the FPA or, to our knowledge, NEPA or the ESA bars a settling party from agreeing to release any claims it may have, in consideration for another party's acceptance of a settlement agreement's terms. Such provisions are quite common, because they enable the parties to a settlement agreement to resolve the matters in dispute with a high degree of certainty. An entity that is not willing to provide such a release need not execute the settlement agreement and may pursue its interests in any other forums available to it.

12. City of Entiat's Concerns

127. When Rocky Reach was constructed in the 1950s, the filling reservoir inundated the downtown core of theEntiat and surrounding waterfront areas, forcing relocation to upland areas of that city's commercial and industrial sector and causing the loss of local agricultural lands. In addition, Chelan obtained waterfront land in the immediate vicinity of the city. Entiat states that these actions resulted in the loss of taxable property, and that the city has never fully recovered from these and other effects of the original flooding and town relocation.

128. Entiat is concerned that the HCP Agreement could cause further erosion of the city's and school district's tax revenues. This could occur because of the acquisition of riparian lands located in the Entiat River Valley[188] or along the Rocky Reach reservoir,

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[186] Rocky Reach and Rock Island HCPs section 9.1; Wells HCP section 9.4.1.

[187] Yakama protest at 8-9.

[188] The Entiat River flows southeast from the Cascade Mountains to its confluence with the Rocky Reach reservoir a few miles above the project dam.

which lands would either be removed from the local tax base or would have their taxing status changed as a result of their use for wildlife habitat. Entiat also fears that unspecified measures in the HCP could create an influx of jobs and population in local communities, placing additional demands on local government and the school district.[189] Entiat states that the EIS inadequately analyzed the potential impacts of the HCP Agreements on local governments and communities, and on Entiat in particular. It requests that the Commission supplement the EIS to address these asserted deficiencies.

129. Chelan replies that Entiat's concerns about additional erosion to its tax base or demands on municipal services are highly speculative. It notes that the tributary conservation plan covers a very large area, from Chief Joseph Dam to the Rock Island tailrace, of which the area within Entiat is a very small portion. It adds that although the plan contemplates the purchase of interests in lands, it also contemplates many other measures that are likely to have no impact on property rights or tax base.[190] Chelan also asserts that the measures under consideration, including in-stream structures and revegetation, noxious weed control, and restoration of stream channel geomorphology, are not large-scale and are unlikely to cause any appreciable influx of jobs or people.

130. The Commission's consideration under FPA section 10(a)(1) of all public interest uses of a waterway encompass the socio-economic consequences of a project. It is possible that at these projects some land could be removed from the local tax base, for instance if title to the land were transferred to a governmental agency. However, whether that will ever happen, and if so, to what extent, is purely speculative at this point. We therefore do not find socio-economic mitigation measures warranted at this time.

III. Commission Consultation Under ESA Section 7(a)

131. Section 7(a) of the ESA requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally-listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat.

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[189] Entiat comments at 1-3.

[190] These could include in-stream structures and revegetation, noxious weed control, and restoration of stream channel geomorphology.

132. Federally-listed aquatic species that inhabit the Mid-Columbia River Basin include the endangered evolutionarily significant units of Upper Columbia River steelhead and spring-run chinook salmon.[191] By letter to NOAA Fisheries of December 9, 2003, the Commission requested formal consultation pursuant to ESA section 7 regarding all three amendment applications. NOAA Fisheries' final Biological Opinions for the Wells, Rocky Reach, and Rock Island applications were filed on March 8, 2004. The Biological Opinions find that incorporating the HCPs into the licenses is not likely to jeopardize the continued existence of the federally endangered salmonids or their critical habitat.[192]

133. Federally listed species under the jurisdiction of the FWS that inhabit the Mid-Columbia River Basin include the threatened bull trout, bald eagle, and grizzly bear, and the endangered Ute ladies'-tresses. By letter to FWS of December 9, 2003, the Commission requested formal consultation pursuant to ESA section 7 regarding all three projects. On January 16, 2004, the Commission amended its request to include formal conferencing[193] on the effects of the proposed actions on areas of proposed critical habitat for bull trout.[194] FWS' final Biological Opinion for the Wells, Rocky Reach, and Rock Island applications was filed on May 13, 2004. It concurs with the Commission that incorporating the HCPs into the licenses is not likely to jeopardize the continued existence or critical habitat of the bull trout or of the federally-listed terrestrial species.

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[191] See n. 24, above.

[192] Yakama asserts that ESA section 7 and NOAA Fisheries' HCP Handbook bar a federally-licensed project from receiving a take permit pursuant to ESA section 10, and that NOAA Fisheries must instead prepare an incidental take statement for such projects. Yakama protest at 17. Whether NOAA Fisheries' issuance of the take permits complies with the ESA is a matter for a reviewing court rather than this Commission.

[193] Conferencing is similar to consultation, except that it applies to the effects of a proposal on critical habitat.

[194] FWS designated proposed critical habitat for bull trout in 2002. 67 Fed. Reg. 71,277 (November 29, 2002).

134. Its non-jeopardy opinion notwithstanding, FWS' Biological Opinion finds that operation of the Projects' turbines, juvenile bypass facilities, adult fishways, and spillways results in incidental take of bull trout. Its Biological Opinion thus contains an Incidental Take Statement for each of the Projects, setting forth Reasonable and Prudent Measures (RPMs) and associated Terms and Conditions for the implementation of the RPMs.[195] The RPMs and Terms and Conditions are attached to each of the project-specific orders, and appropriate license articles are also added.[196]

135. ESA section 7(a)(1)[197] directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. USFWS' Biological Opinion includes three conservation recommendations regarding bull trout, which are the same for all three Projects. These are discussed below.

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[195] USFWS also finds that whether there is incidental take from the implementation of the tributary habitat and hatchery compensation plans cannot be determined until the specific measures are developed, and that separate ESA section 7 consultation will be required when those measures are developed. See, e.g., Biological Opinion, at 95.

[196] See Rocky Reach Article 411, Rock Island Article 414, and Wells Article 61. The Incidental Take Statement also purports to require the Commission to prepare and submit to FWS detailed annual reports on the implementation of the RPMs and Terms and Conditions, including the impact of implementing these measures on bull trout. See, e.g., FWS Biological Opinion at 90. As the RPMs and Terms and Conditions become terms of the license, which governs only the actions of the licensee, we think FWS has exceeded its authority. In any event, we have included in each of the licenses an article requiring the licensee's plans to implement the RPMs and Terms and Conditions to include a provision for the requested annual reports. See, e.g., new Rocky Reach Article 412.

[197] 16 U.S.C. § 1536(a)(1).

1. Develop the monitoring plans called for in the Terms and Conditions through a collaborative process with the FWS, NOAA Fisheries, Washington Department of Fish and Wildlife, relevant Indian tribes, or any other entities these entities deem appropriate.

   The new articles requiring the licensee to comply with the RPMs and Terms and Conditions is consistent with this recommendation.

2. Continued participation by the licensee in the development and implementation (when completed) of a bull trout recovery plan.

   We have not adopted this recommendation in the form recommended by FWS. Although we believe the licensees should participate in the development and implementation of a bull trout recovery plan, the recommendation as framed by FWS is unduly vague. We are therefore reserving authority to require the licensees to participate in the development and implementation of such a plan and will exercise that authority by imposing specific requirements in order to resolve and disputes between FWS and the licensees regarding specific measures the licensees are requested to take.

3. Continued monitoring by the Licensee of total dissolved gas (TDG) and investment in facility improvements to keep TDG levels at or below 110%, or other applicable state water quality standards.

   As noted above, the licensees are voluntarily monitoring and complying with the Washington State Water Quality Standards for temperature and dissolved oxygen in the context of the federal fish passage programs for the Columbia River. This recommendation is therefore superfluous and will not be adopted.

IV. Essential Fish Habitat

136. Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act[198] requires federal agencies to consult with the Secretary of Commerce (Secretary) regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat identified under that act. The Secretary may recommend measures for the protection of Essential Fish Habitat. Section 305(b)(4)(B)[199] of that act requires an agency, within 30 days after receiving recommended measures from NOAA Fisheries or a Regional Fishery Management Council, to describe the measures proposed by the agency for avoiding, mitigating, or offsetting the effects of the agency's action on the Essential Fish Habitat. If the agency does not agree with the Secretary's recommended measures, it must explain its reasons for not following the recommendations.

137. In the same March 8, 2004 letters in which it provided its final Biological Opinions on the license amendment applications, NOAA Fisheries also determined that the Essential Fish Habitat consultation and requirements in its Biological Opinions on the take permit applications apply to the license amendment application proceedings.

V. FPA Section 18 Fishway Prescriptions

138. Section 18 of the FPA[200] states that the Commission shall require construction, maintenance, and operation by a licensee of "such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate." The HCPs state that NOAA Fisheries and FWS reserve authority to prescribe fishways pursuant to section 18 if an HCP is terminated.[201]

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[198] 16 U.S.C. § 1855(b)(2).

[199] 16 U.S.C. § 1855(b)(4)(B).

[200] 16 U.S.C. ' 811.

[201] Rocky Reach and Rock Island HCP section 9.2.2; Wells HCP section 9.5.2.

139. Yakama asserts that the EIS is deficient because it does not discuss whether the HCPs fulfill "the obligations of [NOAA Fisheries] under its FPA [section 18] conditioning authority."[202] As discussed above, the purpose of an EIS is to analyze proposed actions and reasonable alternatives, not to determine whether the action agency has complied with its statutory mandates. In any event, NOAA Fisheries' decision not to prescribe fishways is not a matter reviewable by this Commission.

VI. Water Quality Certification

140. Under section 401(a)(1) of the Clean Water Act (CWA),[203] a state or tribal water quality certification agency must issue or waive certification of any proposed action requiring a federal agency license or permit that "may result in any discharge into . . . navigable waters." American Rivers asserts that the instant license amendment applications trigger the requirement that the licensees obtain water quality certification. Douglas and Chelan respond that no certification is required, because the HCPs do not involve any activities that would result in a "discharge" within the meaning of CWA section 401(a)(1), and that discussion of water quality certification is premature, since no specific measures have been established that Ecology could review for compliance with state standards.[204]

141. The licensees are not required to apply for water quality certification for these amendments. The only identified component of the HCPs that results in any change in discharge is the installation of the Rocky Reach permanent fish bypass facility, for which Chelan has already obtained certification and Commission authorization.[205] We note as well that Ecology was a participant in the HCP negotiations, has intervened in this proceeding, and has not suggested that certification is required in order to implement the HCPs.

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[202] July 29 letter at 7.

[203] 33 U.S.C. § 1341(a)(1).

[204] Chelan answer to American Rivers at 8; Douglas answer at 14-15.

[205] See Public Utility District No. 1 of Chelan County, WA, 99 FERC ¶ 61,059, reh'g denied, 100 FERC ¶ 61,216 (2002).

142. It is possible that measures could be developed for Phase II implementation which would involve modifications to project operations and could cause discharges not currently authorized under the licenses. Should such modifications be needed, a license amendment application would be required, and the issue of certification would be revisited at that time.

VII. Cultural Resources

143. Section 106 of the National Historic Preservation Act (NHPA)[206] requires the Commission to take into account the effects of its actions on historic properties and to afford the Advisory Council on Historic Preservation (Advisory Council) a reasonable opportunity to comment.

144. By letter to the Washington State Historic Preservation Officer (SHPO) and Colville, Umatilla, and Yakama dated March 4, 2004, the Commission staff determined that the Area of Potential Effect for the HCPs includes all lands from 1,000 feet downstream of the Rock Island project tailrace upstream to the tailrace of Chief Joseph Dam. The letter concludes that any modifications to project structures and operations under the HCPs will have no effect on any properties listed on the National Register of Historic Places or eligible therefore.

145. Concerning the tributary habitat enhancement program, the March 4 letter concludes that existing license articles will require consultation with the SHPO before any tributary enhancement work is done within the project boundaries of the Rocky Reach and Rock Island Projects.[207] The Wells license has no comparable articles, but

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[206] 16 U.S.C. § 470f.

[207] Article 409 of the Rock Island license requires Chelan to develop a Cultural Resources Management Plan (CRMP) in consultation with the SHPO, Advisory Council, and Colville. 46 FERC ¶ 61,033 at 61,210. The CRMP was approved in 1990. 53 FERC ¶ 62,255.

Article 410 of the Rock Island license requires Chelan to stop work if it discovers any previously unidentified sites during land-disturbing activities and, if any are found, to file for approval a CRMP with respect to the sites. 46 FERC at 61,210.

(continued)

staff recommends that any order approving the Wells HCP should require inclusion of a license article similar to those in Rock Island and Rocky Reach and requiring consultation with Colville, because there are reservation lands located within the project boundary. The March 4 letter also states that any HCP-related work outside of the project boundaries would not be subject to the Commission's jurisdiction.

146. Responses to the March 4 letter were due by April 4, 2004. Colville concurred with the no-effect finding, subject to the stipulation that the Cultural Resource Management Plans[208] are reviewed and updated in consultation with the Colville Tribal Historic Preservation Officer, and are administered consistent with applicable laws and regulations. The SHPO stated that it concurred, subject to the understanding that consideration of cultural resources during habitat enhancement activities outside the project boundaries will be addressed by the responsible federal agency or agencies, and requested that a map be prepared showing the Areas of Potential Effect for the three projects. In light of the following discussion concerning the relationship between potential effects of the tributary enhancement program, we will require the licensees to provide Area of Potential Effect maps that delineate the potential extent of tributary enhancement measures that could affect cultural resources.

147. The March 4 letter suggests that consultation is not required for actions in the tributary enhancement program outside of existing project boundaries. However, an order issued recently in another proceeding[209] clarifies the relationship between a licensee's responsibilities and the project boundary. The project boundary indicates that the lands within are used for project purposes. This helps to reduce ambiguity for purposes of license administration and compliance by clarifying the geographical scope

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Article 49 of the Rocky Reach license requires Chelan to consult with the SHPO before any construction at the project to determine the need for cultural resources surveys. 22 FERC ¶ 62,348 at 63,510.

[208] A CRMP has been approved for Rock Island. The licensees have voluntarily executed memoranda of agreement with the SHPO for Rocky Reach and Wells, but these have not been incorporated into the existing licenses.

[209] Power Authority of the State of New York, 107 FERC ¶ 61,259 (2004).

of the licensee's responsibilities under its license (and the Commission's regulatory responsibilities), but it does not define those responsibilities and does not always fully indicate the geographic extent of those responsibilities. Small areas outside of the project boundary needed for project purposes and requirements to carry out one-time actions outside of the project boundary may not require the locations where the acts are to be performed to be included within the existing project boundary.

148. The activities to be carried out under the tributary enhancement programs outside of the project boundaries are requirements of the licenses, and therefore are subject to the consultation requirements of NHPA section 106. These sites may not, however, need to be included within the project boundary, because they may involve small areas or one-time actions.

149. We conclude that the Rock Island and Rocky Reach licenses require only minor changes to ensure that any actions outside of the project boundaries and on non-federal lands pursuant to the tributary enhancement programs are in compliance with the NHPA. The Wells license should also be modified to include a requirement to consult with respect to any ground-disturbing activities that may occur within the project boundary or outside of the project boundary on non-federal lands pursuant to the tributary enhancement program. For any such activities that occur on lands administered by another federal agency, it is appropriate for that agency to conduct any necessary consultation under the NHPA. We are also requiring the licensees to develop maps of the Areas of Potential Effect which indicate the off-site areas in which tributary enhancements may be located. The companion orders issued today make the necessary changes.

VIII. License Articles

150. Finally, we note that the parties' applications include draft license articles approving their applications.[210] We have used these recommended articles as a model, but have made one noteworthy change. The HCP Agreements provide in Phase II for unspecified "additional tools" to be employed if the standards are not being met. General criteria for the selection of such additional tools are set forth, but there are no apparent

[210] See, e.g., Rocky Reach application, section V, p. 26.

limits on what these tools might be.[211] Such additional tools may include changes to project facilities and operations that are not currently authorized, and we do not intend, by approving the HCP Agreements, to give the licensees a general authorization to make any changes to project facilities or operations not specifically identified in those agreements. We have therefore included in each companion order a requirement to apply for an amendment to the project license for any such changes in facilities or operations.

151. In conclusion, we find that the HCPs are in the public interest, because they will put into place a program likely to assist in the recovery of the endangered salmonids and to help prevent other salmonids from becoming listed. We will therefore include them in the Wells, Rocky Reach, and Rock Island licenses as special articles.

The Commission orders:

(A) The U.S. Department of the Interior's late motion to intervene, filed January 16, 2004, in Project Nos. 2145-57, 943-083, and 2149-106, is granted.

(B) The U.S. Department of Agriculture's January 9, 2004 motion to intervene in Project No. 2149 is granted.

(C) The Application for Approval of the Wells Anadromous Fish Agreement and Habitat Conservation Plan and Adoption as an Amendment of License, filed on November 24, 2003, by Public Utility District No. 1 of Douglas County, Washington, in Project No. 2149-106, is approved, as discussed in this order and as implemented in the companion order issued today in Public Utility District No. 1 of Douglas County, WA, 107 FERC ¶ 21,283.

(D) The Application for Approval of the Rock Island Anadromous Fish Agreement and Habitat Conservation Plan and Adoption as an Amendment of License, filed on November 24, 2003, by Public Utility District No. 1 of Chelan County, Washington, in Project No. 943-083, is approved, as discussed in this order and implemented in the companion order issued in Public Utility District No. 1 of Chelan County, WA, 107 FERC ¶ 61,282.

(E) The "Application for Approval of the Rocky Reach Anadromous Fish

[211] See, e.g., Rocky Reach HCP Agreement, section 5.3.2.

Agreement and Habitat Conservation Plan as an Offer of Settlement and Adoption as an Amendment of License," filed on November 24, 2003, by Public Utility District No. 1 of Chelan County, Washington, in Project No. 2145-057 is approved, as discussed in this order and implemented in the companion order issued in Public Utility District No. 1 of Douglas County, WA, 107 FERC ¶ 61,281.

(F) The Mid-Columbia Proceeding is terminated insofar as it pertains to Rocky Reach Project No. 2145.

By the Commission. Commissioner Kelly not participating.

(S E A L)

Linda Mitry,
Acting Secretary.

APPENDIX B PUBLIC OUTREACH AND TECHNICAL WORKING GROUPS

B.1 TABLE OF EVENTS AND MEETINGS

To announce the initiation of Chelan PUD's early engagement phase of the Rock Island Relicensing, Chelan PUD notified potential participants through various channels of communication, including community events, radio interviews, a virtual open house, and multilingual flyers. Early engagement began with the issuance of a Preliminary Information Document (PID)[1] on July 8, 2021. This document provided interested parties with background information on the Rock Island Project, information about the upcoming FERC relicensing process, and solicited feedback regarding potential issues.

Following publication of the PID, Chelan PUD invited participants to participate in a virtual public issue identification workshop in October 2021. A subsequent November meeting addressed relicensing schedules, Technical Working Group (TWG) facilitation, and reviewed comments from the October workshop. In January 2022, three TWGs were established through a three-day engagement workshop, focusing on Fish and Aquatic Resources, Wildlife and Botanical Resources, and Recreation and Land Use Resources.

Throughout the 2022 - 2023 early engagement phase, the TWGs convened to assist Chelan PUD with the identification of potential data gaps, review of draft study plans, and review of study reports. Twice a year, Chelan PUD published an early engagement newsletter summarizing TWG activities prior to the TWG Manager meeting. Below is a list of early engagement events and meetings that occurred, along with links to relevant correspondences (when applicable).

[1] Rock Island Preliminary Information Document

TABLE OF EARLY ENGAGEMENT EVENTS AND MEETINGS

Date	Location	Events and Meetings	Links to Consultation Material
Mar. 15, 2021	Virtual (Microsoft Teams [Teams])	Rock Island Relicensing Preliminary Meeting - Department of Archaeology and Historic Preservation (DAHP)	n/a
Mar. 23, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting – Washington Department of Ecology (Ecology)	n/a
Mar. 29, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting - U.S. Fish and Wildlife Service (USFWS)	n/a
Mar. 31, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting – Bureau of Land Management (BLM)	n/a
Apr. 1, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting – National Park Service (NPS)	n/a
Apr. 13, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting - Confederated Tribes of the Colville Reservation (CTCR)	n/a
Apr. 16, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting – Washington Department of Fish and Wildlife (WDFW) option 1	n/a
Apr. 19, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting - WDFW option 2	n/a
Apr. 26, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting – Confederated Tribes and Bands of the Yakama Nation (Yakama Nation)	n/a
Apr. 27, 2021	Virtual (Teams)	Rock Island Relicensing Preliminary Meeting - Bureau of Indian Affairs (BIA)	n/a

Date	Location	Events and Meetings	Links to Consultation Material
May 19, 2021	Virtual (Teams)	Rock Island Relicensing Outreach - Upper Columbia United Tribes (UCUT)	n/a
June 26, 2021	Pybus Market Booth	Pybus Market	General Flyer (attached) Relicensing Poster Board (attached)
July 4, 2021	Walla Walla Park	Café Booth At Community Outreach	Rock Island Relicensing Presentación de Divulgación Pública
July 6, 2021	KOZI (via phone) KOHO (in studio)	Radio Spots	n/a
July 8, 2021	Virtual (Zoom)	Virtual Open House	Rock Island Relicensing Virtual Open House - July 2021 - YouTube Rock Island Relicensing Public Outreach Presentation
July 13, 2021	766 S Mission Street, Wenatchee WA 98801	Café Community Outreach	Rock Island Relicensing Presentación de Divulgación Pública
Aug. 4, 2021	Virtual (Teams)	Relicensing Overview with Paul Ward (Columbia River Inter-Tribal Fish Commission [CRITFC])	n/a
Sept. 24, 2021	Virtual (Teams)	Rock Island Relicensing Call - Ecology	n/a
Sept. 28, 2021	Virtual (Teams)	Rock Island Relicensing Call - WA Parks	n/a
Sept. 28, 2021	Virtual (Teams)	Rock Island Relicensing Call - BLM	n/a
Sept. 28, 2021	Virtual (Teams)	Rock Island Relicensing Call - DAHP	n/a
Sept. 29, 2021	Virtual (Teams)	Rock Island Relicensing Call - BIA	n/a
Sept. 29, 2021	Virtual (Teams)	Rock Island Relicensing Call - CTCR	n/a

Date	Location	Events and Meetings	Links to Consultation Material
Sept. 29, 2021	Virtual (Teams)	Rock Island Relicensing Call - CTCR	n/a
Sept. 30, 2021	Virtual (Teams)	Rock Island Relicensing Call - National Oceanic and Atmospheric Administration (NOAA)	n/a
Sept. 30, 2021	Virtual (Teams)	Rock Island Relicensing Call - USFWS	n/a
Sept. 30, 2021	Virtual (Teams)	Rock Island Relicensing Call - WDFW	n/a
Sept. 30, 2021	Virtual (Teams)	Rock Island Relicensing Call - Yakama Nation	n/a
Oct. 14, 2021	Virtual (Teams)	Stakeholder Workshop	Stakeholder Invitation Email (attached) Postcard to Tribes (attached) Rock Island Relicensing Stakeholder Workshop Invitation (attached) Relicensing One Pager (attached)
Nov. 18, 2021	Virtual (Teams)	Post-Workshop	Post-Workshop Invitation Email (attached)
Nov. 23, 2021	Virtual (Teams)	Lake Chelan and Rocky Reach Cultural Forum Meeting – provided relicensing update	n/a
Dec. 14, 2021	Virtual (Zoom)	DAHP and Chelan County PUD Zoom	n/a
Dec. 16, 2021	Virtual (Teams)	Rock Island Relicensing Managers Update - BLM	n/a
Dec. 17, 2021	Virtual (Teams)	Rock Island Relicensing Managers Update - NOAA	n/a
Dec. 21, 2021	Virtual (Teams)	Rock Island Relicensing Managers Update - WDFW	n/a
Dec. 28, 2021	Virtual (Teams)	Rock Island Relicensing Managers Update - Ecology	n/a
Dec. 28, 2021	Virtual (Teams)	Rock Island Relicensing Managers Update - Yakama Nation (1)	n/a

Date	Location	Events and Meetings	Links to Consultation Material
Jan. 4, 2022	Virtual (Teams)	Rock Island Relicensing Managers Update - WA Parks	n/a
Jan. 5, 2022	Virtual (Teams)	Rock Island Relicensing Managers Update – BIA	n/a
Jan. 5, 2022	Virtual (Teams)	Rock Island Relicensing Managers Update – USFWS	n/a
Jan. 11, 2022	Virtual (Teams)	Rock Island Relicensing Managers Update - CTCR	n/a
Jan. 11, 2022	Virtual (Teams)	Rock Island Relicensing Managers Update - WADNR	n/a
Jan. 18, 2022	Virtual (Teams)	Kick-off Engagement Workshop (Day 1 of 3)	Rock Island Relicensing 2021 Recap (attached) Kick-off Engagement Workshop Invitation Email (Day 1 of 3 - attached)
Jan. 19, 2022	Virtual (Teams)	Kick-off Engagement Workshop (Day 2 of 3)	Kick-off Engagement Workshop Invitation Email (Day 2 of 3 - attached)
Jan. 20, 2022	Virtual (Teams)	Kick-off Engagement Workshop (Day 3 of 3)	Kick-off Engagement Workshop Invitation Email (Day 3 of 3 - attached)
Mar. 8, 2022	Virtual (Teams)	Fish & Aquatic Technical Working Group (TWG)	March 8, 2022 Meeting Summary (attached)
Mar. 10, 2022	Virtual (Teams)	Wildlife & Botanical TWG	March 10, 2022 Meeting Summary (attached)
Mar. 17, 2022	Virtual (Teams)	Recreation & Land Use TWG	March 17, 2022 Meeting Summary (attached)
Apr. 12, 2022	Virtual (Teams)	Fish & Aquatic TWG	April 12, 2022 Meeting Summary (attached)
Apr. 14, 2022	Virtual (Teams)	Wildlife & Botanical TWG	April 14, 2022 Meeting Summary (attached)
Apr. 21, 2022	Virtual (Teams)	Recreation & Land Use TWG	April 21, 2022 Meeting Summary (attached)
May 4, 2022	Chelan PUD Headquarter	Yakama Nation Meet and Greet/Rock Island Tour	n/a
May 10, 2022	Virtual (Teams)	Fish & Aquatic TWG	May 10, 2022 Meeting Summary (attached)
May 12, 2022	Virtual (Teams)	Wildlife & Botanical TWG	May 12, 2022 Meeting Summary (attached)

Date	Location	Events and Meetings	Links to Consultation Material
May 12, 2022	Virtual (Teams)	Relicensing Meeting – Yakama Nation	n/a
May 19, 2022	Virtual (Teams)	Recreation & Land Use TWG	May 19, 2022 Meeting Summary (attached)
June 9, 2022	Virtual (Teams)	Wildlife & Botanical TWG	June 9, 2022 Meeting Summary (attached)
June 14, 2022	Virtual (Teams)	Fish & Aquatic TWG	June 14, 2022 Meeting Summary (attached)
June 16, 2022	Virtual (Teams)	Recreation & Land Use TWG	June 16, 2022 Meeting Summary (attached)
June 30, 2022	In person	Presentation/Rock Island Tour – CTCR	n/a
July 12, 2022	Virtual (Teams)	Fish & Aquatic TWG	July 12, 2022 Meeting Summary (attached)
July 14, 2022	Virtual (Teams)	Wildlife & Botanical TWG	July 14, 2022 Meeting Summary (attached)
July 19, 2022	Virtual (Teams)	Manager's TWG	July 19, 2022 Meeting Summary (attached)
July 21, 2022	Virtual (Teams)	Recreation & Land Use TWG	July 21, 2022 Meeting Summary (attached)
Aug. 9, 2022	Virtual (Teams)	Fish & Aquatic TWG	August 9, 2022 Meeting Summary (attached)
Aug. 11, 2022	Cancelled	Wildlife & Botanical TWG	n/a
Aug. 18, 2022	Virtual (Teams)	Recreation & Land Use TWG	August 18, 2022 Meeting Summary (attached)
Sept. 13, 2022	Virtual (Teams)	Fish & Aquatic TWG	September 13, 2022 Meeting Summary (attached)
Sept. 8, 2022	Cancelled	Wildlife & Botanical TWG	n/a
Sept. 15, 2022	Virtual (Teams)	Recreation & Land Use TWG	September 15, 2022 Meeting Summary (attached)
Oct. 5, 2022	Virtual (Teams)	Ute Ladies-tresses Discovery – USFWS	n/a
Oct. 11, 2022	Virtual (Teams)	Fish & Aquatic TWG	October 11, 2022 Meeting Summary (attached)
Oct. 11, 2022	Virtual (Teams)	Pacific Lamprey Subteam TWG	October 11, 2022 Meeting Summary (attached)

Date	Location	Events and Meetings	Links to Consultation Material
Oct. 11, 2022	Virtual (Teams)	Bull Trout & Resident Fish Subteam TWG	October 11, 2022 Meeting Summary (attached)
Oct. 13, 2022	Virtual (Teams)	Wildlife & Botanical TWG	October 13, 2022 Meeting Summary (attached)
Oct. 20, 2022	Cancelled	Recreation & Land Use TWG	n/a
Nov. 1, 2022	Virtual (Teams)	Manager's TWG	November 1, 2022 Meeting Summary (attached)
Nov. 4, 2022	Chelan PUD Headquarter	Rock Island Relicensing - City of Rock Island/Chelan PUD	n/a
Nov. 8, 2022	Virtual (Teams)	Fish & Aquatic TWG	November 1, 2022 Meeting Summary (attached)
Nov. 10, 2022	Cancelled	Wildlife & Botanical TWG	n/a
Nov. 17, 2022	Virtual (Teams)	Recreation & Land Use TWG	November 17, 2022 Meeting Summary (attached)
Nov. 21, 2022	Chelan PUD Headquarter	Rock Island Relicensing - WDFW	n/a
Nov. 22, 2022	Chelan PUD Headquarter	Rock Island Relicensing - USFWS	n/a
Dec. 8, 2022	Cancelled	Wildlife & Botanical TWG	n/a
Dec. 13, 2022	Hybrid (Confluence Technology Center [CTC]/ Teams)	Fish & Aquatic TWG	December 13, 2022 Meeting Summary (attached)
Dec. 13, 2022	Hybrid (CTC/Teams)	Macrophytes Subteam TWG	December 13, 2022 Meeting Summary (attached)
Dec. 19, 2022	Virtual (Teams)	Pacific Lamprey Subteam TWG	December 19, 2022 Meeting Summary (attached)
Dec. 22, 2022	Cancelled	Recreation & Land Use TWG	n/a

Date	Location	Events and Meetings	Links to Consultation Material
Jan. 10, 2023	Hybrid (CTC/Teams)	Fish & Aquatic TWG	January 10, 2023 Meeting Summary (attached)
Jan. 12, 2023	Cancelled	Wildlife & Botanical TWG	n/a
Jan. 19, 2023	Cancelled	Recreation & Land Use TWG	n/a
Feb. 9, 2023	Cancelled	Wildlife & Botanical TWG	n/a
Feb. 14, 2023	Cancelled	Fish & Aquatic TWG	n/a
Feb. 14, 2023	Hybrid (CTC/Teams)	Bull Trout-Resident Fish Subteam TWG	February 14, 2023 Meeting Summary (attached)
Feb. 14, 2023	Hybrid (CTC/Teams)	Pacific Lamprey Subteam TWG	February 14, 2023 Meeting Summary (attached)
Feb. 16, 2023	Virtual (Teams)	Recreation & Land Use TWG	February 16, 2023 Meeting Summary (attached)
Mar. 14, 2023	Cancelled	Fish & Aquatic TWG	n/a
Mar. 14, 2023	Virtual (Teams)	Macrophytes Subteam TWG	March 14, 2023 Meeting Summary (attached)
Mar. 16, 2023	Hybrid (CTC/Teams) + Site Visit	Recreation & Land Use TWG	March 16, 2023 Meeting Summary (attached)
Mar. 16, 2023	Hybrid (CTC/Teams)	Wildlife & Botanical TWG	March 16, 2023 Meeting Summary (attached)
Mar. 16, 2023	Hybrid (CTC/Teams)	RTE Plants Subteam TWG	March 16, 2023 Meeting Summary (attached)
Apr. 11, 2023	Hybrid (CTC/Teams)	Fish & Aquatic TWG	April 11, 2023 Meeting Summary (attached)
Apr. 11, 2023	Hybrid (CTC/Teams)	Water Quality Subteam TWG	April 11, 2023 Meeting Summary (attached)
Apr. 11, 2023	Hybrid (CTC/Teams)	White Sturgeon Subteam TWG	April 11, 2023 Meeting Summary (attached)
Apr. 13, 2023	Cancelled	Wildlife & Botanical TWG	n/a
Apr. 18, 2023	Virtual (Teams)	Manager's TWG	April 18, 2023 Meeting Summary (attached)
Apr. 20, 2023	Cancelled	Recreation & Land Use TWG	n/a
May 9, 2023	Cancelled	Fish & Aquatic TWG	n/a

Date	Location	Events and Meetings	Links to Consultation Material
May 9, 2023	Virtual (Teams)	Pacific Lamprey Subteam TWG	May 9, 2023 Meeting Summary (attached)
May 11, 2023	Cancelled	Wildlife & Botanical TWG	n/a
May 18, 2023	Hybrid (CTC/Teams)	Recreation & Land Use TWG	May 18, 2023 Meeting Summary (attached)
June 8, 2023	Cancelled	Wildlife & Botanical TWG	n/a
June 13, 2023	Cancelled	Fish & Aquatic TWG	n/a
June 15, 2023	Cancelled	Recreation & Land Use TWG	n/a
July 11, 2023	Cancelled	Wildlife & Botanical TWG	n/a
July 13, 2023	Cancelled	Fish & Aquatic TWG	n/a
July 20, 2023	Cancelled	Recreation & Land Use TWG	n/a
Aug. 8, 2023	Cancelled	Fish & Aquatic TWG	n/a
Aug. 17, 2023	Hybrid (CTC/Teams)	Recreation & Land Use TWG	August 17, 2023 Meeting Summary (attached)
Aug. 17, 2023	Hybrid (CTC/Teams)	Wildlife & Botanical TWG	August 17, 2023 Meeting Summary (attached) (same as above)
Aug. 28, 2023	Chelan PUD Headquarter	RI Ponds Nexus to Relicensing Process – Audubon Society	n/a
Sept. 12, 2023	Hybrid (CTC/Teams)	Fish & Aquatic TWG	September 12, 2023 Meeting Summary (attached)
Sept. 12, 2023	Hybrid (CTC/Teams)	Water Quality Subteam TWG	September 12, 2023 Meeting Summary (attached)
Sept. 12, 2023	Hybrid (CTC/Teams)	Macrophytes Subteam	September 12, 2023 Meeting Summary (attached) (same as above)
Sept. 19, 2023	Virtual (Teams)	Manager's TWG	September 19, 2023 Meeting Summary (attached)

Date	Location	Events and Meetings	Links to Consultation Material
Sept. 22, 2023	Rock Island City Hall	Rock Island Ponds – City of Rock Island	n/a
Oct. 30, 2023	Hybrid (Chelan PUD Conference Room/Teams)	Relicensing and Cultural Resource Program Meeting - Yakama Nation	n/a

STATEMENT

Chelan PUD is initiating public engagement for the Rock Island Hydroelectric Project (Project) Federal Energy Regulatory Commission (FERC) relicensing process. Your participation is encouraged, and will help Chelan PUD to prepare for further studies, collaboration, and decisions during the multi-year relicensing process. The first step is publication of the Rock Island Preliminary Information Document (PID), which is intended to provide stakeholders with a general understanding of the existing environment and Project operations, and to prepare for working group meetings beginning in the Fall of 2021. The PID will be released in July. Additionally, input is requested via an online survey July 6 to Aug. 6, 2021. Please visit **www.chelanpud.org/NewLicense** or email **RIRelicensing@chelanpud.org** for more information.

Upcoming Important Dates

- » Booth at Pybus Market - June 26
- » 4th of July Celebration at Walla Walla Point Park
- » Survey Monkey Questionnaire – Available July 6 to Aug. 6
- » Virtual Open House – July 8
- » Technical Working Group Meetings – Fall 2021

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CHELAN COUNTY

Contact Information

RI email address
RIRelicensing@chelanpud.org

RI Relicensing Homepage
www.chelanpud.org/NewLicense

The Rock Island Relicensing webpage includes facts about the Rock Island Project, including its history, operations, facilities, and location. The webpage also features important dates, access to relicensing documents and associated links to provide comments, and contact information for Chelan PUD relicensing staff.

INFORME

Chelan PUD está iniciando la participación pública para el proceso de renovación de licencia operativa de la presa Rock Island con la Comisión Reguladora de Energía Federal (FERC). Su participación ayudará a Chelan PUD a prepararse para más estudios, crear colaboraciones y tomar decisiones durante el proceso de renovación de licencia, que tardará varios años. El primer paso es la publicación del Documento de Consulta Preliminar de Rock Island (PID, disponible en español si es requerido), que tiene como objetivo proporcionar a las partes interesadas una comprensión general del entorno existente, las operaciones del proyecto, y preparar las reuniones de los grupos de trabajo previstas para el otoño de 2021. El PID se dará a conocer en julio. Además, se solicita información a través de una encuesta en línea del 6 de julio al 6 de agosto de 2021. Envíe un correo electrónico a RIRelicensing@chelanpud.org para obtener más información.

Próximas fechas importantes

- Pybus Market - 26 de junio
- Celebración del 4 de julio- parque Walla Walla
- Cuestionario – Disponible del 6 de julio al 6 de agosto
- Evento Público Virtual – 8 de julio
- Reuniones del Grupo de Trabajo – Otoño 2021

P.U.D.
CHELAN COUNTY

Información de contacto

Dirección de correo electrónico
RIRelicensing@chelanpud.org

Chelan County PUD
Rock Island Hydroelectric Project

N

P.U.D. CHELAN COUNTY

Wenatchee River

Flow

Rocky Reach Dam

Douglas County

Homewater Preserve (960 acres)

Coyote Dunes Natural Area (26 acres)

Wenatchee Confluence State Park (197 acres)

Walla Walla Point Park (70 acres)

Wenatchee Riverfront Park (31 acres)

Wenatchee

East Wenatchee

Kirby Billingsley Hydro Park (70 acres)

Chelan County

Rock Island

Malaga

Columbia River

Rock Island Dam

Legend

- Rock Island Hydroelectric Project Boundary (FERC #943)
- Recreation Lands
- Wildlife Mitigation Lands (Homewater Preserve)

Kate Taylor

Subject: FW: Chelan PUD's Rock Island Relicensing Stakeholder Workshop
Location: Microsoft Teams Meeting

Start: Thu 10/14/2021 8:00 AM
End: Thu 10/14/2021 3:00 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Nuria Holmes

Categories: To-Do or Follow Up, Correspondence

-----Original Appointment-----
From: Nuria Holmes <Nuria.Holmes@Kleinschmidtgroup.com>
Sent: Friday, October 1, 2021 1:51 PM
To: Nuria Holmes; RIRelicensing; Janel Ulrich; 'Nuria Holmes'
Cc: Michelle Smith; Alene Underwood; Marcie Clement; Matt Shales; Craig Gyselinck; Nathalie Denis; Emily Waters; Kate Taylor; Jeff Deason; Kelly Schaeffer; Kelly Larimer; Michael Dammarell; Jennifer.frozena@sol.doi.gov; Keith.Hatch@bia.gov; Rudy.peone@bia.gov; Richard_Bailey@blm.gov; molly_boyter@blm.gov; cbryan@blm.gov; edellis@blm.gov; diane_priebe@blm.gov; cody.desautel@colvilletribes.com; guy.moura@colvilletribes.com; Joe.peone.fnw@collvilletribes.com; kirk.truscott@colvilletribes.com; holly.borth@dahp.wa.gov; rob.whitlam@dahp.wa.gov; jpac461@ecy.wa.gov; sage.park@ecy.wa.gov; mark.peterschmidt@ecy.wa.gov; kepr461@ecy.wa.gov; thomas.tebb@ecy.wa.gov; bzim461@ecy.wa.gov; Scott.Carlon@noaa.gov; susan_rosebrough@nps.gov; jim_l_craig@fws.gov; william_gale@fws.gov; stephen_lewis@fws.gov; RD_Nelle@fws.gov; Cynthia_Raekes@fws.gov; randi.riggs@fws.gov; andrew.fielding@parks.wa.gov; colleen.foster@parks.wa.gov; Chelsea.Harris@parks.wa.gov; ryan.layton@parks.wa.gov; brian.patnode@parks.wa.gov; carmen.andonaegui@dfw.wa.gov; amanda.barg@dfw.wa.gov; Benjamin.Blank@dfw.wa.gov; dave.burgess@dfw.wa.gov; Daniel.didricksen@dfw.wa.gov; Richard.Finger@dfw.wa.gov; Michael.Garrity@dfw.wa.gov; heinebah@dfw.wa.gov; laura.heironimus@dfw.wa.gov; Brock.Hoenes@dfw.wa.gov; chad.jackson@dfw.wa.gov; emily.jeffreys@dfw.wa.gov; michael.jewell@dfw.wa.gov; katherine.kelly2@dfw.wa.gov; michael.livingston@dfw.wa.gov; travis.maitland@dfw.wa.gov; mondamjm@dfw.wa.gov; Andrew.Murdoch@dfw.wa.gov; Eric.oswald@dfw.wa.gov; Matt.Polacek@dfw.wa.gov; Daniel.Rawding@dfw.wa.gov; graham.simon@dfw.wa.gov; Michael.Tonseth@dfw.wa.gov; Patrick.Verhey@dfw.wa.gov; lamr@yakamafish-nsn.gov; mild@yakamafish-nsn.gov; murk@yakamafish-nsn.gov; Phil_Rigdon@Yakama.com; rogb@yakamafish-nsn.gov; bmoran@americanrivers.org; jason@ccfeg.org; stacie@cdrpa.org; kevin.overbay@co.chelan.wa.us; lmerrill@wenatcheewa.gov; renee@entiatchamber.com; Paul_Grutter@golder.com; john@kingrose.us; nwarner@applecapital.net; skylinebal@gmail.com; executive_director@wenatcheeriverinstitute.org
Subject: [External] Chelan PUD's Rock Island Relicensing Stakeholder Workshop
When: Thursday, October 14, 2021 8:00 AM-3:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting

Thank you for your interest in the Rock Island Relicensing Stakeholder Workshop. The purpose of this Workshop is:

- ✓ For Chelan PUD to *listen* to stakeholder perspectives on issues and *seek information* to information the Preliminary Application Document (PAD), and potential studies, and;
- ✓ For stakeholders to get an *opportunity to sign-up* to participate in future resource discussions.

Please find the Meeting Agenda here. An invitation is attached with additional information. We encourage you to attend the entire meeting; however, feel free to attend only the breakout sessions for resource areas that interest you. You can do this by simply leaving the meeting, and re-joining using the same Microsoft Teams link (please see below). The meeting is organized into the following sessions (there are 15-minute breaks between sessions):

Technology Check*	8:00 – 8:30 a.m.
Meeting Begins and Opening Remarks	8:30 – 9:15 a.m.
This session is recommended for all stakeholders.	
Natural Sciences Breakout Sessions including:	
✓ Fish & Aquatic	9:30 – 10:15 a.m.
✓ Water Quality	10:30 – 11:15 a.m.
✓ Wildlife and Botanical	11:30 a.m. – 12:15 p.m.
Lunch Break	12:15 – 1:15 p.m.
Social Sciences Breakout Sessions including:	
✓ Recreation & Land Use	1:15 – 2:00 p.m.
✓ Public Cultural & Historic Resources	2:15 – 3:00 p.m.
✓ *Privileged* Cultural & Historic Discussion *(This session by invitation only)*	3:00 – 3:45 p.m.

*We encourage you to log in from 8:00 a.m. to 8:30 a.m. (prior the beginning of the meeting) to confirm your audio and video are working. We will be available to troubleshoot with you if you have any technology problems. If you are concerned about using Microsoft Teams, please e-mail nuria.holmes@kleinschmidtgroup.com and we will set up a one-on-one practice call for you prior to the Workshop.

If you have questions about this Workshop, please e-mail the Relicensing Team at RIRelicensing@ChelanPUD.org. We look forward to your participation at the Workshop!

Chelan PUD's Relicensing Team

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Join with a video conferencing device

605787966@t.plcm.vc
Video Conference ID: 111 874 033 9
Alternate VTC instructions

Or call in (audio only)

+1 207-248-8024,,643526944# United States, Portland

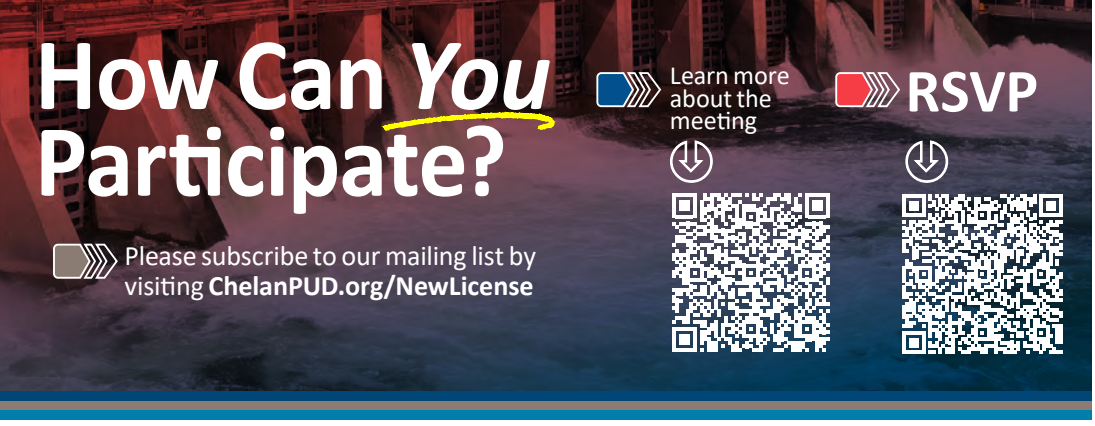
Phone Conference ID: 643 526 944#
Find a local number | Reset PIN

Learn More | Meeting options

<< Attachments:

image001.jpg (79.7KB)
image002.jpg (15.5KB)
Rock Island October Stakeholder Workshop Invitation.pdf (1.5MB)
>>


You're Invited
P.U.D.
CHELAN COUNTY
WHAT: Rock Island Relicensing Stakeholder Workshop
WHEN: Thursday, October 14, 2021 8:30 a.m. - 3:00 p.m.
WHERE: Virtual Meeting via Microsoft Teams
Chelan PUD wants your input on resources that are important to you!
Chelan PUD is hosting a virtual workshop to prepare for the Federal Energy Regulatory Commission (FERC) relicensing of the Rock Island Hydroelectric Project (FERC No. 943). State and Federal resource agencies, Native American tribes, local government interests, non-governmental organizations, special interest groups, homeowners, and any other interested stakeholders are invited and encouraged to participate. For more information, please visit www.ChelanPUD.org/NewLicense



CHELAN COUNTY PUD
PO BOX 1231
WENATCHEE, WA 98807

<<DP2>> <<ENDORSEMENT LINE>>
<<FULL NAME>>
<<ADDRESS LINE 1>>
<<ADDRESS LINE 2>>

You're Invited

What: Rock Island Relicensing Stakeholder Workshop

When: Thursday, October 14, 2021
8:30 a.m. - 3:00 p.m.

Where: Virtual Meeting via Microsoft Teams

Chelan PUD wants your input on resources that are important to you!

Chelan PUD is hosting a virtual workshop to prepare for the Federal Energy Regulatory Commission (FERC) relicensing of the Rock Island Hydroelectric Project (FERC No. 943). State and Federal resource agencies, Native American Tribes, local government interests, non-governmental organizations, homeowners, and any other interested stakeholders are invited and encouraged to participate. For more information, please visit www.ChelanPUD.org/newlicense.

Here's How You Can Prepare:

1. Review the Agenda for resources sessions (Chelan PUD recommends all participants attend the overview session)
2. Review the Relicensing Overview and Preliminary Information Document to learn about Rock Island Project resources
3. Ensure you can join the Microsoft Teams meeting
4. Provide comments for discussion in advance via SmartComment
5. Attend the October 14, 2021 Virtual Stakeholder Workshop

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CHELAN COUNTY

ROCK ISLAND PROJECT

RELICENSING

OVERVIEW

Most non-federal hydroelectric projects in the United States operate under licenses issued by the Federal Energy Regulatory Commission (FERC). An original hydropower license authorizes the construction and operation of a project for a term of up to 50 years. Relicensing is the process to renew an existing (previously licensed) project. The license term upon relicensing is 30 to 50 years.

The Public Utility District No. 1 of Chelan County (Chelan PUD) has an existing license for the Rock Island Hydroelectric Project FERC No. 943 (Project) that expires in 2028. The next license will be the Project's third license. Obtaining a new operating license requires Chelan PUD to complete a multi-year application process and file a final license application on or before December 31, 2026. The official relicensing process begins with Chelan PUD filing a Notice of Intent and Pre-Application Document (PAD) no later than December 31, 2023.

Beginning in late 2021, Chelan PUD is initiating an early and voluntary stakeholder engagement process in support of the Rock Island Project relicensing process. Chelan PUD proposes to work closely with all relicensing participants, including federal and state resource agencies, Native American Tribes, local governmental entities, conservation advocates, and other stakeholders (including individuals), in an effort to help inform Chelan PUD's development of the PAD and identify issues and data gaps that may require study during relicensing. This early engagement is intended to result in Chelan PUD identifying, and potentially implementing, some studies prior to the official FERC relicensing process to both inform the PAD and support the official FERC relicensing process.

A relicensing process requires licensees and FERC to look at an array of public resources related to a licensed hydropower project, including both developmental (e.g., power generation, irrigation, flood control, and water supply) and non-developmental resources (e.g., fish and wildlife resources, cultural, and other environmental resources).

Chelan PUD encourages all stakeholders to participate in the Rock Island Project relicensing process. For more information on how to get involved in this relicensing, review FERC's guide on participating in a relicensing.

Contact Information

- Email Us
  » RIRelicensing@chelanpud.org
- On The Web
  » www.chelanpud.org/NewLicense

The Rock Island Relicensing webpage includes facts about the Rock Island Project, including its history, operations, facilities, and location. The webpage also features important dates, access to relicensing documents and associated links to provide comments, and contact information for Chelan PUD relicensing staff.

Kate Taylor

Subject: FW: Rock Island Relicensing Stakeholder Meeting - Post Workshop
Location: Microsoft Teams Meeting

Start: Thu 11/18/2021 1:00 PM
End: Thu 11/18/2021 2:00 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Janel Ulrich

-----Original Appointment-----
From: Janel Ulrich
Sent: Monday, November 1, 2021 7:07 AM
To: Janel Ulrich; jeff.deason@kleinschmidtgroup.com; Kate Taylor; Matt Shales; 'Nuria Holmes'; 'Nathalie Denis'; 'bmoran@americanrivers.org'; 'bruce.mccammon@gmail.com'; 'Jennifer.frozena@sol.doi.gov'; 'Michael.dammarell@bia.gov'; 'cbryan@blm.gov'; 'Richard_Bailey@blm.gov'; 'jason@ccfeg.org'; 'stacie@cdrpa.org'; 'cLillquist@eastwenatcheewa.gov'; 'charles.brushwood@colvilletribes.com'; 'kirk.truscott@colvilletribes.com'; 'carj@critfc.org'; 'ski@critfc.org'; 'holly.borth@dahp.wa.gov'; 'michael.houser@dahp.wa.gov'; 'rob.whitlam@dahp.wa.gov'; 'bzim461@ecy.wa.gov'; 'jpac461@ecy.wa.gov'; 'john@kingrose.us'; 'scott.carlon@noaa.gov'; 'tracy.bowerman@ucsrb.org'; 'judy_neibauer@fws.gov'; 'RD_Nelle@fws.gov'; 'randi_riggs@fws.gov'; 'stephen_lewis@fws.gov'; 'william_gale@fws.gov'; 'brian.patnode@parks.wa.gov'; 'colleen.foster@parks.wa.gov'; 'Andrew.Murdoch@dfw.wa.gov'; 'laura.heironimus@dfw.wa.gov'; 'Michael.Tonseth@dfw.wa.gov'; 'Patrick.Verhey@dfw.wa.gov'; 'Richard.Finger@dfw.wa.gov'; 'murk@yakamafish-nsn.gov'; 'lamr@yakamafish-nsn.gov'
Cc: Alene Underwood; 'Keith.Hatch@bia.gov'; 'diane_priebe@blm.gov'; 'etaecker@blm.gov'; 'hanne@cdlandtrust.org'; 'lmerrill@wenatcheewa.gov'; 'cody.desautel@colvilletribes.com'; 'Lisa.Pelly@tu.org'; 'skylinebal@gmail.com'; 'amanda.barg@dfw.wa.gov'; 'Benjamin.Blank@dfw.wa.gov'; 'Brock.Hoenes@dfw.wa.gov'; 'carmen.andonaegui@dfw.wa.gov'; 'chad.jackson@dfw.wa.gov'; 'Michael.Garrity@dfw.wa.gov'; 'hare@yakamafish-nsn.gov'; RIRelicensing; ivet@yakamafish-nsn.gov; Brandon Rogers; Bailey, Richard N; blod@yakamafish-nsn.gov
Subject: Rock Island Relicensing Stakeholder Meeting - Post Workshop
When: Thursday, November 18, 2021 1:00 PM-2:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting

Please don't forget to join us tomorrow!!

Greetings: Please join us for our next Rock Island Relicensing Stakeholder meeting. This invitation is being sent to everyone who signed up to participate in future technical working group (TWG) meetings, and as an optional invitation to those who attended the Stakeholder Workshop on Oct. 14th but did not sign up for future TWG participation. We will be sending out the whiteboard notes from the Stakeholder Workshop in a separate email. The meeting documents are below. Thank you, Janel Ulrich

Stakeholder Meeting – Post Workshop

Date : 11-18-2021
Start Time : 01:00 PM
End Time : 02:00 PM
Location : **Click here to join the meeting** (or Call-in Dial: 253-999-5697 Enter Conference ID: 907559099#)

Event Documents :

Document Name	Document Type	Link
2021-11-18 Stakeholder Meeting – Post Workshop Agenda	Agenda	RI943-1756358526-1885
High Level Rock Island Relicensing Schedule	Agenda	RI943-1756358526-1883

Rock Island Relicensing

Greetings:

In preparation of attendance of the Rock Island Hydroelectric Project (FERC Project No. 943) Relicensing Technical Working Group (TWG) meetings coming up on January 18, 19 and 20, 2022 we want to ensure that you have the information that was presented in 2021. Below we have provided a timeline of events and associated documents to help you prepare.

- On July 8, 2021 we shared a Preliminary Information Document
- On October 14, 2021, we held a virtual Stakeholder Workshop to provide some background information and begin identifying potential issues associated with Rock Island relicensing (agenda and presentation). We collected stakeholder comments and compiled notes, which can be reviewed to identify any mischaracterizations and/or missing information through December 10, 2021.
- On November 18, 2021, we hosted a Post-Workshop meeting (agenda). In this meeting we discussed the overall schedule, and described that the upcoming January meetings which will be two half days of an interactive Engagement Workshop (please attend both) followed by a full day that covers a Project Overview, and Issue and Potential Study Progression.

After the January meetings, the TWGs will be broken into resource areas and will work to finalize issue statements, evaluate the potential Project related impacts, review existing information, and identify potential studies. Potential studies will be evaluated using the FERC Study Criteria. Studies approved by Chelan PUD will be planned and executed as time allows in early engagement.

It is expected that participants in the TWGs will be available to actively participate 1-2 days per month over the next few years, with one primary participant and one alternate identified from each organization. Community members are welcome and encouraged to organize yourselves with others who have similar interests, where possible.

If you have any additional questions or comments, please reach out to the relicensing team at RIRelicensing@chelanpud.org. All of these documents and meetings can also be found at www.chelanpud.org/newlicense.

Thank you,

Chelan PUD Relicensing Team

Kate Taylor

Subject: FW: Rock Island Relicensing TWG Kickoff Part 1 of 3 - Engagement Workshop
Location: MS Teams

Start: Tue 1/18/2022 8:00 AM
End: Tue 1/18/2022 12:00 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Janel Ulrich

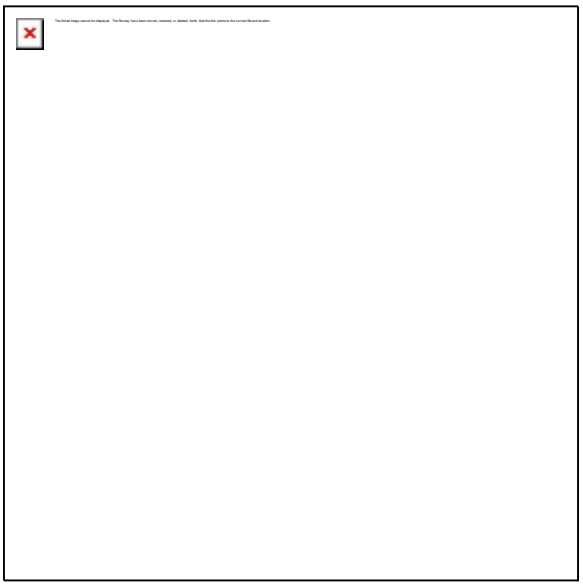
-----Original Appointment-----
From: Janel Ulrich
Sent: Monday, January 3, 2022 12:51 PM
To: Janel Ulrich; 'rob.whitlam@dahp.wa.gov'; 'mark.peterschmidt@ecy.wa.gov'; 'guy.moura@colvilletribes.com'; 'Richard_Bailey@blm.gov'; 'andrew.fielding@parks.wa.gov'; 'edellis@blm.gov'; 'diane_priebe@blm.gov'; 'RD_Nelle@fws.gov'; 'justin.yeager@noaa.gov'; 'mild@yakamafish-nsn.gov'; 'lamr@yakamafish-nsn.gov'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'walter.fertig@dnr.wa.gov'; 'ski@critfc.org'; 'jody.walters@noaa.gov'; 'holly.borth@dahp.wa.gov'; 'colleen.foster@parks.wa.gov'; 'porl@critfc.org'; 'randi_riggs@fws.gov'; 'gsilver@critfc.org'; 'warp@critfc.org'; 'laura@ucut-nsn.org'; 'william_gale@fws.gov'; 'brian.patnode@parks.wa.gov'; 'murk@yakamafish-nsn.gov'; 'ghoff@usbr.gov'; 'Cynthia_Raekes@fws.gov'; 'Joe.peone.fnw@colvilletribes.com'; 'Keith.Hatch@bia.gov'; 'bmoran@americanrivers.org'; 'wmcdermott@americanrivers.org'; 'amelia.marchand@colvilletribes.com'; 'cbryan@blm.gov'; 'cody.desautel@colvilletribes.com'; 'Jennifer.frozena@sol.doi.gov'; 'kepr461@ecy.wa.gov'; 'Michael.dammarell@bia.gov'; 'Phil_Rigdon@Yakama.com'; 'rogb@yakamafish-nsn.gov'; 'Rudy.peone@bia.gov'; 'ryan.layton@parks.wa.gov'; 'sage.park@ecy.wa.gov'; 'susan_rosebrough@nps.gov'; 'cflores@wvc.edu'; 'Veronica.Farias@cdhd.wa.gov'; 'alma.castillo@cdhd.wa.gov'; 'lmerrill@wenatcheewa.gov'; 'sdriver.smdsolutions@gmail.com'; 'stephen_lewis@fws.gov'; 'marthacbean@gmail.com'; 'Chelsea.Harris@parks.wa.gov'; Matt Shales; 'jim_l_craig@fws.gov'; 'rbetancourt@cvch.org'; 'norma@handinhandmd.org'; 'cwebster@carneylaw.com'; 'dmamor44@gmail.com'; 'jkimbell59@msn.com'; 'nuria.holmes@kleinschmidtgroup.com'; 'laura.rivera@wenatcheecafe.org'; 'executive_director@wenatcheeriverinstitute.org'; 'rosa@wenatchee.org'; 'sghays51@msn.com'; 'okeefe@amwhitewater.org'; 'PeggyE@cascadiacd.org'; 'curt@cdlandtrust.org'; 'stacie@cdrpa.org'; 'mike.kaputa@co.chelan.wa.us'; 'mike@completetheloopcoalition.org'; 'brenthall@ctuir.org'; 'sbrawley@eastmontparks.com'; 'bruce.mccammon@gmail.com'; 'epthome509@gmail.com'; 'haowen52@gmail.com'; 'lyonsm483@gmail.com'; 'skylinebal@gmail.com'; 'Office@gwid.org'; 'info@ncwaudubon.org'; 'DBAKDDS@nwi.net'; 'info@ourvalleyourfuture.org'; 'brennan.mueller@pse.com'; 'buck.workman@railamerica.com'; 'amatherly@spokanetribe.com'; 'ann.welz@tpl.org'; 'shiloh@wenatchee.org'; 'derickson@wenatcheewa.gov'; 'sports@wenatchevalley.org'; 'lewisd@wsdot.wa.gov'; 'aaronjackson@ctuir.org'; 'adams.joan@wenatcheeschools.org'; 'akaryl70@gmail.com'; 'aldon.ramirez@wenatcheecafe.org'; 'amanda.barg@dfw.wa.gov'; 'Andrew.Murdoch@dfw.wa.gov'; 'Benjamin.Blank@dfw.wa.gov'; 'bilsufish@yahoo.com'; 'blod@yakamafish-nsn.gov'; 'bryan.mercier@bia.gov'; 'bryan.mulligan@usda.gov'; 'carj@critfc.org'; 'carmen.andonaegui@dfw.wa.gov'; 'casey_barney@yakama.com'; 'chad.jackson@dfw.wa.gov'; 'charles.brushwood@colvilletribes.com'; 'cindy.preston@dnr.wa.gov'; 'cLillquist@eastwenatcheewa.gov'; 'cody.gillin@gmail.com'; 'columbiabasin@wnps.org'; 'cpl@dnr.wa.gov'; 'cwright@lgl.com'; 'damon.roberts@ecy.wa.gov'; 'Daniel.Rawding@dfw.wa.gov'; 'Danielle_squeochs@yakama.com'; 'dave.burgess@dfw.wa.gov'; 'devon.comstock@dfw.wa.gov';

Kate Taylor

Subject:	FW: Rock Island Relicensing TWG Kickoff Part 2 of 3 - Engagement Workshop
Location:	MS Teams
Start:	Wed 1/19/2022 8:00 AM
End:	Wed 1/19/2022 12:00 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer:	Janel Ulrich

-----Original Appointment-----
From: Janel Ulrich
Sent: Monday, January 3, 2022 12:56 PM
To: Janel Ulrich; 'rob.whitlam@dahp.wa.gov'; 'mark.peterschmidt@ecy.wa.gov'; 'guy.moura@colvilletribes.com'; 'Richard_Bailey@blm.gov'; 'andrew.fielding@parks.wa.gov'; 'edellis@blm.gov'; 'diane_priebe@blm.gov'; 'RD_Nelle@fws.gov'; 'justin.yeager@noaa.gov'; 'mild@yakamafish-nsn.gov'; 'lamr@yakamafish-nsn.gov'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'walter.fertig@dnr.wa.gov'; 'ski@critfc.org'; 'jody.walters@noaa.gov'; 'holly.borth@dahp.wa.gov'; 'colleen.foster@parks.wa.gov'; 'porl@critfc.org'; 'randi_riggs@fws.gov'; 'gsilver@critfc.org'; 'warp@critfc.org'; 'laura@ucut-nsn.org'; 'william_gale@fws.gov'; 'brian.patnode@parks.wa.gov'; 'murk@yakamafish-nsn.gov'; 'ghoff@usbr.gov'; 'Cynthia_Raekes@fws.gov'; 'Joe.peone.fnw@colvilletribes.com'; 'Keith.Hatch@bia.gov'; 'bmoran@americanrivers.org'; 'wmcdermott@americanrivers.org'; 'amelia.marchand@colvilletribes.com'; 'cbryan@blm.gov'; 'cody.desautel@colvilletribes.com'; 'Jennifer.frozena@sol.doi.gov'; 'kepr461@ecy.wa.gov'; 'Michael.dammarell@bia.gov'; 'Phil_Rigdon@Yakama.com'; 'rogb@yakamafish-nsn.gov'; 'Rudy.peone@bia.gov'; 'ryan.layton@parks.wa.gov'; 'sage.park@ecy.wa.gov'; 'susan_rosebrough@nps.gov'; 'cflores@wvc.edu'; 'Veronica.Farias@cdhd.wa.gov'; 'alma.castillo@cdhd.wa.gov'; 'lmerrill@wenatcheewa.gov'; 'sdriver.smdsolutions@gmail.com'; 'stephen_lewis@fws.gov'; 'marthacbean@gmail.com'; 'Chelsea.Harris@parks.wa.gov'; Matt Shales; 'jim_l_craig@fws.gov'; 'rbetancourt@cvch.org'; 'norma@handinhandmd.org'; 'cwebster@carneylaw.com'; 'dmamor44@gmail.com'; 'jkimbell59@msn.com'; 'nuria.holmes@kleinschmidtgroup.com'; 'laura.rivera@wenatcheecafe.org'; 'executive_director@wenatcheeriverinstitute.org'; 'rosa@wenatchee.org'; 'sghays51@msn.com'; 'okeefe@amwhitewater.org'; 'PeggyE@cascadiacd.org'; 'curt@cdlandtrust.org'; 'stacie@cdrpa.org'; 'mike.kaputa@co.chelan.wa.us'; 'mike@completetheloopcoalition.org'; 'brenthall@ctuir.org'; 'sbrawley@eastmontparks.com'; 'bruce.mccammon@gmail.com'; 'epthome509@gmail.com'; 'haowen52@gmail.com'; 'lyonsm483@gmail.com'; 'skylinebal@gmail.com'; 'Office@gwid.org'; 'info@ncwaudubon.org'; 'DBAKDDS@nwi.net'; 'info@ourvalleyourfuture.org'; 'brennan.mueller@pse.com'; 'buck.workman@railamerica.com'; 'amatherly@spokanetribe.com'; 'ann.welz@tpl.org'; 'shiloh@wenatchee.org'; 'derickson@wenatcheewa.gov'; 'sports@wenatchevalley.org'; 'lewisd@wsdot.wa.gov'; 'aaronjackson@ctuir.org'; 'adams.joan@wenatcheeschools.org'; 'akaryl70@gmail.com'; 'aldon.ramirez@wenatcheecafe.org'; 'amanda.barg@dfw.wa.gov'; 'Andrew.Murdoch@dfw.wa.gov'; 'Benjamin.Blank@dfw.wa.gov'; 'bilsufish@yahoo.com'; 'blod@yakamafish-nsn.gov'; 'bryan.mercier@bia.gov'; 'bryan.mulligan@usda.gov'; 'carj@critfc.org'; 'carmen.andonaegui@dfw.wa.gov'; 'casey_barney@yakama.com'; 'chad.jackson@dfw.wa.gov'; 'charles.brushwood@colvilletribes.com'; 'cindy.preston@dnr.wa.gov'; 'cLillquist@eastwenatcheewa.gov'; 'cody.gillin@gmail.com'; 'columbiabasin@wnps.org'; 'cpl@dnr.wa.gov'; 'cwright@lgl.com'; 'damon.roberts@ecy.wa.gov'; 'Daniel.Rawding@dfw.wa.gov'; 'Danielle_squeochs@yakama.com'; 'dave.burgess@dfw.wa.gov'; 'devon.comstock@dfw.wa.gov';

'emily.jeffreys@dfw.wa.gov'; 'emorling@hotmail.com'; 'Fisheries@ctuir.org'; 'gloria.elias@wenatcheecafe.org'; 'graham.simon@dfw.wa.gov'; 'Greer.Maier@ucsrb.org'; 'hanne@cdlandtrust.org'; 'hare@yakamafish-nsn.gov'; 'heinebah@dfw.wa.gov'; 'info@wvmcc.org'; 'ivet@yakamafish-nsn.gov'; 'janezanol@me.com'; 'jason@ccfeg.org'; 'jeff.deason@kleinschmidtgroup.com'; 'jennifer.cawdery@wsu.edu'; 'JerryInChelan@Gmail.com'; 'jesse.schultz@dfw.wa.gov'; 'jessica_lally@yakama.com'; 'jfish53@msn.com'; 'jkorfiatis@wvc.edu'; 'john@kingrose.us'; 'jrgutzwiler@gmail.com'; 'judy_neibauer@fws.gov'; 'kalman.bugica@ecy.wa.gov'; Kate Taylor; 'kevin98801@yahoo.com'; 'kpindel@blm.gov'; 'ksh30@comcast.net'; 'laura.heironimus@dfw.wa.gov'; 'lauren.kirigin@atg.wa.gov'; 'leflerr@live.com'; 'licon714@hotmail.com'; 'Lisa.Pelly@tu.org'; 'mariaelena.avilez@wenatcheecafe.org'; 'Matt.Polacek@dfw.wa.gov'; 'mbbiggar@gmail.com'; 'mgy.pe@nwi.net'; 'Michael.Garrity@dfw.wa.gov'; 'michael.houser@dahp.wa.gov'; 'Michael.Tonseth@dfw.wa.gov'; 'mmoore@nwtf.net'; 'molly_boyter@blm.gov'; 'mondamjm@dfw.wa.gov'; 'mrmontgomery@verizon.net'; 'neffa3@gmail.com'; 'nwarner@applecapital.net'; 'nwarner@tnc.org'; 'orissa12@hotmail.com'; 'Patrick.Verhey@dfw.wa.gov'; 'Paul_Grutter@golder.com'; 'plstrand@nwi.net'; 'potoole@nwcouncil.org'; 'ptobiska@nwi.net'; Rahul Venkatesh (PSE); 'renee@entiatchamber.com'; 'rfitch@wvc.edu'; 'Richard.Finger@dfw.wa.gov'; 's697striata@frontier.com'; 'sandibill@nwi.net'; 'scott.carlon@noaa.gov'; 'smttocs@nwi.net'; 'strick99@yahoo.com'; 'toklat2@nwi.net'; 'tracy.bowerman@ucsrb.org'; 'wendybanjobird@gmail.com'; Alene Underwood; Ryan Baker; Jennifer Burns; Scott Hopkins; William Towey; Marcie Clement; Sam Dilly; Catherine Willard; Von Pope; Lance Keller; 'nathalie.denis@kleinschmidtgroup.com'; Michelle Smith; 'mayor@rockislandwa.gov'; Stephen Greenwood; Michael Kern; nujhat@pdx.edu; RIRelicensing; Bugica, Kalman (ECY); Audrey Thompson; Craig Gyselinck; pmugunthan@fourpeaksenv.com; okeefe@americanwhitewater.org; MaryLouise Keefe; Matthew Harper; Roberts, Damon (ECY); Nathalie Denis
Cc: Kelly Larimer; Kai Steimle; Peterschmidt, Mark F. (ECY); Heiner, Bruce A (DFW); 'rodney.cawston.env@colvilletribes.com'; Brian Odell; Noah Oliver; Huinker, James (DNR); Kelsey Rugani; Kokos, Sonja R; 'billtowey5@gmail.com'; 'aleneunderwood@gmail.com'
Subject: Rock Island Relicensing TWG Kickoff Part 2 of 3 - Engagement Workshop
When: Wednesday, January 19, 2022 8:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: MS Teams



Greetings:

This is the finalized invitation for the second of three sessions of the Technical Working Group kickoff for Rock Island relicensing; the previous placeholder will be replaced by this invite (**please join using the link below**). This day of the kickoff will be the second half of an Engagement Workshop led by Steve Greenwood (Director for Training for the National Policy Consensus Center at Portland State University) and Michael Kern (formerly

the Director of the William D. Ruckelshaus Center at Washington State University and the University of Washington). The agenda is attached below.

Date : 01-19-2022
Start Time : 8:00 AM
End Time : 12:00 PM
Location : **Click here to join the meeting** (or Call-in Dial: 207-248-8024 Enter Conference ID 396305841#)

Thank you,

Janel Ulrich
Hydro Licensing Manager
Chelan PUD
Mobile (509) 670-7564
Desk (509) 661-4400

<< Attachments:

2021-01-19 TWG Kickoff Engagement Workshop Day 2 Agenda.pdf (102.9KB)

>>

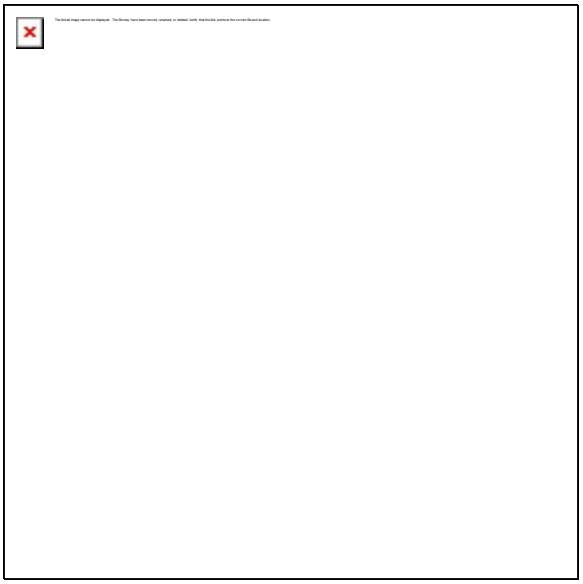
'emily.jeffreys@dfw.wa.gov'; 'emorling@hotmail.com'; 'Fisheries@ctuir.org'; 'gloria.elias@wenatcheecafe.org'; 'graham.simon@dfw.wa.gov'; 'Greer.Maier@ucsrb.org'; 'hanne@cdlandtrust.org'; 'hare@yakamafish-nsn.gov'; 'heinebah@dfw.wa.gov'; 'info@wvmcc.org'; 'ivet@yakamafish-nsn.gov'; 'janezanol@me.com'; 'jason@ccfeg.org'; 'jeff.deason@kleinschmidtgroup.com'; 'jennifer.cawdery@wsu.edu'; 'JerryInChelan@Gmail.com'; 'jesse.schultz@dfw.wa.gov'; 'jessica_lally@yakama.com'; 'jfish53@msn.com'; 'jkorfiatis@wvc.edu'; 'john@kingrose.us'; 'jrgutzwiler@gmail.com'; 'judy_neibauer@fws.gov'; 'kalman.bugica@ecy.wa.gov'; Kate Taylor; 'kevin98801@yahoo.com'; 'kpindel@blm.gov'; 'ksh30@comcast.net'; 'laura.heironimus@dfw.wa.gov'; 'lauren.kirigin@atg.wa.gov'; 'leflerr@live.com'; 'licon714@hotmail.com'; 'Lisa.Pelly@tu.org'; 'mariaelena.avilez@wenatcheecafe.org'; 'Matt.Polacek@dfw.wa.gov'; 'mbbiggar@gmail.com'; 'mgy.pe@nwi.net'; 'Michael.Garrity@dfw.wa.gov'; 'michael.houser@dahp.wa.gov'; 'Michael.Tonseth@dfw.wa.gov'; 'mmoore@nwtf.net'; 'molly_boyter@blm.gov'; 'mondamjm@dfw.wa.gov'; 'mrmontgomery@verizon.net'; 'neffa3@gmail.com'; 'nwarner@applecapital.net'; 'nwarner@tnc.org'; 'orissa12@hotmail.com'; 'Patrick.Verhey@dfw.wa.gov'; 'Paul_Grutter@golder.com'; 'plstrand@nwi.net'; 'potoole@nwcouncil.org'; 'ptobiska@nwi.net'; Rahul Venkatesh (PSE); 'renee@entiatchamber.com'; 'rfitch@wvc.edu'; 'Richard.Finger@dfw.wa.gov'; 's697striata@frontier.com'; 'sandibill@nwi.net'; 'scott.carlon@noaa.gov'; 'smttocs@nwi.net'; 'strick99@yahoo.com'; 'toklat2@nwi.net'; 'tracy.bowerman@ucsrb.org'; 'wendybanjobird@gmail.com'; Alene Underwood; Ryan Baker; Jennifer Burns; Scott Hopkins; William Towey; Marcie Clement; Sam Dilly; Catherine Willard; Von Pope; Lance Keller; 'nathalie.denis@kleinschmidtgroup.com'; Michelle Smith; 'mayor@rockislandwa.gov'; Stephen Greenwood; 'Michael Kern'; 'nujhat@pdx.edu'; RIRelicensing; Bugica, Kalman (ECY); Audrey Thompson; Craig Gyselinck; pmugunthan@fourpeaksenv.com; okeefe@americanwhitewater.org; MaryLouise Keefe; Matthew Harper; Roberts, Damon (ECY); Nathalie Denis
Cc: Kelly Larimer; Kai Steimle; joni wynecoop; Peterschmidt, Mark F. (ECY); Heiner, Bruce A (DFW); 'rodney.cawston.env@colvilletribes.com'; Brian Odell; Noah Oliver; Huinker, James (DNR); Kelsey Rugani; 'billtowey5@gmail.com'; Jason McLellan (FNW); Douglas Marconi (ENV); 'aleneunderwood@gmail.com'; elemsoren@gmail.com
Subject: Rock Island Relicensing TWG Kickoff Part 1 of 3 - Engagement Workshop
When: Tuesday, January 18, 2022 8:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: MS Teams

Good afternoon,

Attached is a document that we ask you to either print or have on your computer ready to access for an exercise during tomorrow's (Tuesday's) session.

Thank you in advance for your participation.

Rock Island Relicensing Team



Greetings:

This is the finalized invitation for the first of three sessions of the Technical Working Group kickoff for Rock Island relicensing; the previous placeholder will be replaced by this invite (**please join using the link below**).

This day of the kickoff will be the first half of an Engagement Workshop led by Steve Greenwood (Director for Training for the National Policy Consensus Center at Portland State University) and Michael Kern (formerly the Director of the William D. Ruckelshaus Center at Washington State University and the University of Washington). The agenda and a recap of information from 2021 are attached below (most useful if you were unable to attend the Oct. and Nov. meetings). Additional meeting materials for the workshop will be send to those who plan to attend.

Date : 01-18-2022
Start Time : 8:00 AM
End Time : 12:00 PM
Location : **Click here to join the meeting** (or Call-in Dial: 207-248-8024 Enter Conference ID 110034726#)

Thank you,

Janel Ulrich
Hydro Licensing Manager
Chelan PUD
Mobile (509) 670-7564
Desk (509) 661-4400

<< Attachments:

2021-01-18 TWG Kickoff Engagement Workshop Day 1 Agenda.pdf (103.0KB)
Rock Island Relicensing 2021 Recap 2021-01-04.pdf (134.6KB)
FAMILY OUTING ROLE PLAY EXERCISE 2022.docx (19.0KB)

>>

Kate Taylor

Subject: FW: Rock Island Relicensing TWG Kickoff Part 3 of 3
Location: Microsoft Teams Meeting

Start: Thu 1/20/2022 8:00 AM
End: Thu 1/20/2022 12:00 PM

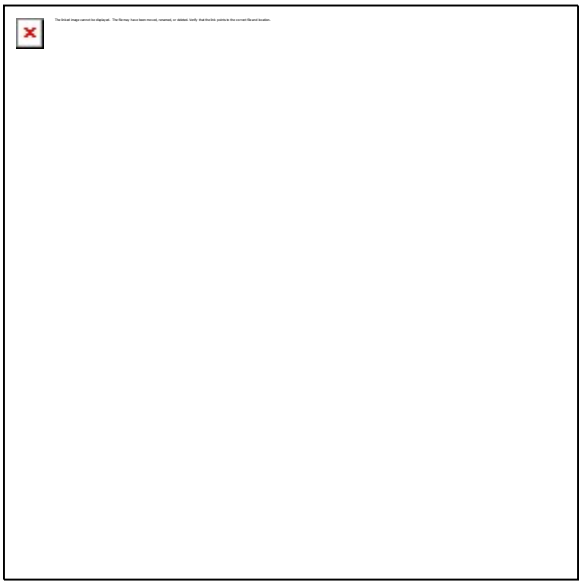
Recurrence: (none)

Meeting Status: Accepted

Organizer: Janel Ulrich

-----Original Appointment-----
From: Janel Ulrich
Sent: Friday, November 19, 2021 1:43 PM
To: Janel Ulrich; 'rob.whitlam@dahp.wa.gov'; 'mark.peterschmidt@ecy.wa.gov'; 'guy.moura@colvilletribes.com'; 'Richard_Bailey@blm.gov'; 'andrew.fielding@parks.wa.gov'; 'edellis@blm.gov'; 'diane_priebe@blm.gov'; 'RD_Nelle@fws.gov'; 'justin.yeager@noaa.gov'; 'mild@yakamafish-nsn.gov'; 'lamr@yakamafish-nsn.gov'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'walter.fertig@dnr.wa.gov'; 'ski@critfc.org'; 'jody.walters@noaa.gov'; 'holly.borth@dahp.wa.gov'; 'colleen.foster@parks.wa.gov'; 'porl@critfc.org'; 'randi_riggs@fws.gov'; 'gsilver@critfc.org'; 'warp@critfc.org'; 'laura@ucut-nsn.org'; 'william_gale@fws.gov'; 'brian.patnode@parks.wa.gov'; 'murk@yakamafish-nsn.gov'; 'ghoff@usbr.gov'; 'Cynthia_Raekes@fws.gov'; 'Joe.peone.fnw@colvilletribes.com'; 'Keith.Hatch@bia.gov'; 'bmoran@americanrivers.org'; 'wmcdermott@americanrivers.org'; 'amelia.marchand@colvilletribes.com'; 'cbryan@blm.gov'; 'cody.desautel@colvilletribes.com'; 'Jennifer.frozena@sol.doi.gov'; 'kepr461@ecy.wa.gov'; 'Michael.dammarell@bia.gov'; 'Phil_Rigdon@Yakama.com'; 'rogb@yakamafish-nsn.gov'; 'Rudy.peone@bia.gov'; 'ryan.layton@parks.wa.gov'; 'sage.park@ecy.wa.gov'; 'susan_rosebrough@nps.gov'; 'cflores@wvc.edu'; 'Veronica.Farias@cdhd.wa.gov'; 'alma.castillo@cdhd.wa.gov'; 'lmerrill@wenatcheewa.gov'; 'sdriver.smdsolutions@gmail.com'; 'stephen_lewis@fws.gov'; 'marthacbean@gmail.com'; 'Chelsea.Harris@parks.wa.gov'; Matt Shales; 'jim_l_craig@fws.gov'; 'rbetancourt@cvch.org'; 'norma@handinhandmd.org'; 'cwebster@carneylaw.com'; 'dmamor44@gmail.com'; 'jkimbell59@msn.com'; 'nuria.holmes@kleinschmidtgroup.com'; 'laura.rivera@wenatcheecafe.org'; 'executive_director@wenatcheeriverinstitute.org'; 'rosa@wenatchee.org'; 'sghays51@msn.com'; 'okeefe@amwhitewater.org'; 'PeggyE@cascadiacd.org'; 'curt@cdlandtrust.org'; 'stacie@cdrpa.org'; 'mike.kaputa@co.chelan.wa.us'; 'mike@completetheloopcoalition.org'; 'brenthall@ctuir.org'; 'sbrawley@eastmontparks.com'; 'bruce.mccammon@gmail.com'; 'epthome509@gmail.com'; 'haowen52@gmail.com'; 'lyonsm483@gmail.com'; 'skylinebal@gmail.com'; 'Office@gwid.org'; 'info@ncwaudubon.org'; 'DBAKDDS@nwi.net'; 'info@ourvalleyourfuture.org'; 'brennan.mueller@pse.com'; 'buck.workman@railamerica.com'; 'amatherly@spokanetribe.com'; 'ann.welz@tpl.org'; 'shiloh@wenatchee.org'; 'derickson@wenatcheewa.gov'; 'sports@wenatchevalley.org'; 'lewisd@wsdot.wa.gov'; 'aaronjackson@ctuir.org'; 'adams.joan@wenatcheeschools.org'; 'akaryl70@gmail.com'; 'aldon.ramirez@wenatcheecafe.org'; 'amanda.barg@dfw.wa.gov'; 'Andrew.Murdoch@dfw.wa.gov'; 'Benjamin.Blank@dfw.wa.gov'; 'bilsufish@yahoo.com'; 'blod@yakamafish-nsn.gov'; 'bryan.mercier@bia.gov'; 'bryan.mulligan@usda.gov'; 'carj@critfc.org'; 'carmen.andonaegui@dfw.wa.gov'; 'casey_barney@yakama.com'; 'chad.jackson@dfw.wa.gov'; 'charles.brushwood@colvilletribes.com'; 'cindy.preston@dnr.wa.gov'; 'cLillquist@eastwenatcheewa.gov'; 'cody.gillin@gmail.com'; 'columbiabasin@wnps.org'; 'cpl@dnr.wa.gov'; 'cwright@lgl.com'; 'damon.roberts@ecy.wa.gov'; 'Daniel.Rawding@dfw.wa.gov'; 'Danielle_squeochs@yakama.com'; 'dave.burgess@dfw.wa.gov'; 'devon.comstock@dfw.wa.gov';

'emily.jeffreys@dfw.wa.gov'; 'emorling@hotmail.com'; 'Fisheries@ctuir.org'; 'gloria.elias@wenatcheecafe.org'; 'graham.simon@dfw.wa.gov'; 'Greer.Maier@ucsrb.org'; 'hanne@cdlandtrust.org'; 'hare@yakamafish-nsn.gov'; 'heinebah@dfw.wa.gov'; 'info@wvmcc.org'; 'ivet@yakamafish-nsn.gov'; 'janezanol@me.com'; 'jason@ccfeg.org'; 'jeff.deason@kleinschmidtgroup.com'; 'jennifer.cawdery@wsu.edu'; 'JerryInChelan@Gmail.com'; 'jesse.schultz@dfw.wa.gov'; 'jessica_lally@yakama.com'; 'jfish53@msn.com'; 'jkorfiatis@wvc.edu'; 'john@kingrose.us'; 'jrgutzwiler@gmail.com'; 'judy_neibauer@fws.gov'; 'kalman.bugica@ecy.wa.gov'; Kate Taylor; 'kevin98801@yahoo.com'; 'kpindel@blm.gov'; 'ksh30@comcast.net'; 'laura.heironimus@dfw.wa.gov'; 'lauren.kirigin@atg.wa.gov'; 'leflerr@live.com'; 'licon714@hotmail.com'; 'Lisa.Pelly@tu.org'; 'mariaelena.avilez@wenatcheecafe.org'; 'Matt.Polacek@dfw.wa.gov'; 'mbbiggar@gmail.com'; 'mgy.pe@nwi.net'; 'Michael.Garrity@dfw.wa.gov'; 'michael.houser@dahp.wa.gov'; 'Michael.Tonseth@dfw.wa.gov'; 'mmoore@nwtf.net'; 'molly_boyter@blm.gov'; 'mondamjm@dfw.wa.gov'; 'mrmontgomery@verizon.net'; 'neffa3@gmail.com'; 'nwarner@applecapital.net'; 'nwarner@tnc.org'; 'orissa12@hotmail.com'; 'Patrick.Verhey@dfw.wa.gov'; 'Paul_Grutter@golder.com'; 'plstrand@nwi.net'; 'potoole@nwcouncil.org'; 'ptobiska@nwi.net'; Rahul Venkatesh (PSE); 'renee@entiatchamber.com'; 'rfitch@wvc.edu'; 'Richard.Finger@dfw.wa.gov'; 's697striata@frontier.com'; 'sandibill@nwi.net'; 'scott.carlon@noaa.gov'; 'smttocs@nwi.net'; 'strick99@yahoo.com'; 'toklat2@nwi.net'; 'tracy.bowerman@ucsrb.org'; 'wendybanjobird@gmail.com'; Alene Underwood; Ryan Baker; Jennifer Burns; Scott Hopkins; William Towey; Marcie Clement; Sam Dilly; Catherine Willard; Von Pope; Lance Keller; 'nathalie.denis@kleinschmidtgroup.com'; Michelle Smith; 'mayor@rockislandwa.gov'
Cc: RIRelicensing; Bugica, Kalman (ECY); Audrey Thompson; Craig Gyselinck; pmugunthan@fourpeaksenv.com; okeefe@americanwhitewater.org; MaryLouise Keefe; Matthew Harper; Roberts, Damon (ECY); Nathalie Denis; Stacy Horton; Kelly Larimer; Kai Steimle; Peterschmidt, Mark F. (ECY); Heiner, Bruce A (DFW); 'rodney.cawston.env@colvilletribes.com'; Brian Odell; Noah Oliver; Huinker, James (DNR); Kelsey Rugani; Jason McLellan (FNW); Jeff Osborn; Kim Osborn; 'aleneunderwood@gmail.com'
Subject: Rock Island Relicensing TWG Kickoff Part 3 of 3
When: Thursday, January 20, 2022 8:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting



Greetings:

This is the third of three sessions of the Technical Working Group kickoff for Rock Island relicensing. This third day will be shortened to four hours. The focus will be a project and FERC overview, and setting up Technical Working Groups. Please see the attached agenda.

Date : 01-20-2022
Start Time : 8:00 AM

End Time : 12:00 PM
Location : **Click here to join the meeting** (or Call-in Dial: 253-999-5697 Enter Conference ID 733015534#)

Thank you,

Janel Ulrich
Hydro Licensing Manager
Chelan PUD
Mobile (509) 670-7564
Desk (509) 661-4400

<< Attachments:

2021-01-20 TWG Kickoff Day 3 Agenda.pdf (102.1KB)

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ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: March 8, 2022
TIME: 8:00 a.m. – 5:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Review and discuss the Fish and Aquatic TWG Guidelines.
- Provide an overview of Fish and Aquatic Issues List, including its purpose and how it was developed, and build understanding of how the Issues List will be reviewed and discussed within the TWG.
- Begin to walk-through the Issues List, by topic, gain clarity on comments, and share plans for two early studies.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	ATTENDANCE	PARTICIPANT
American Rivers	Yes	Moran, Bridget
Blue Leaf	No	Robichaud, Dave
Blue Leaf	Yes	Wright, Corey
Bureau of Indian Affairs	No	Hatch, Keith
Cascade Fisheries	No	Lundgren, Jason
Chelan County Public Utility District No. 1	Yes	Clement, Marcie
Chelan County Public Utility District No. 1	Yes	Hopkins, Scott
Chelan County Public Utility District No. 1	Yes	Keller, Lance
Chelan County Public Utility District No. 1	Yes	Odell, Brian

Chelan County Public Utility District No. 1	Yes	Taylor, Kate
Chelan County Public Utility District No. 1	Yes	Towey, William
Chelan County Public Utility District No. 1	Yes	Ulrich, Janel
Chelan County Public Utility District No. 1	Yes	Underwood, Alene
Chelan County Public Utility District No. 1	Yes	Willard, Catherine
Columbia River Inter-Tribal Commission	No	Porter, Lauri
Columbia River Inter-Tribal Commission	No	Skiles, Tom
Confederated Tribes and Bands of Yakama Nation	No	Blodgett, David
Confederated Tribes and Bands of Yakama Nation	No	Harvey, Elaine
Confederated Tribes and Bands of Yakama Nation	No	Miller, Donella
Confederated Tribes and Bands of Yakama Nation	Yes	Iverson, Tom
Confederated Tribes and Bands of Yakama Nation	Yes	Lampman, Ralph
Confederated Tribes and Bands of Yakama Nation	Yes	Murdoch, Keely
Confederated Tribes and Bands of Yakama Nation	Yes	Rogers, Brandon
Confederated Tribes of the Colville Reservation	No	Marconi, Douglas
Confederated Tribes of the Colville Reservation	No	Nine, Bret
Confederated Tribes of the Colville Reservation	Yes	Baldwin, Casey
Confederated Tribes of the Colville Reservation	Yes	McLellan, Jason
Confederated Tribes of the Colville Reservation	Yes	Truscott, Kirk
Confederated Tribes of the Umatilla Indian Reservation	No	Hall, Brent
Confederated Tribes of the Umatilla Indian Reservation	No	Huber, Audie
Confederated Tribes of the Umatilla Indian Reservation	No	Jackson, Aaron
Four Peaks Environmental	Yes	Miller, Joe
Four Peaks Environmental	Yes	Mugunthan, Pradeep

Individual	Yes	Hays, Steve
Kleinschmidt Associates	Yes	Denis, Nathalie
Kleinschmidt Associates	Yes	Keefe, MaryLouise
Kleinschmidt Associates	Yes	Steimle, Kai
Kleinschmidt Associates	Yes	Thompson, Audrey
National Oceanic & Atmospheric Adminstration	No	Yeager, Justin
National Oceanic & Atmospheric Adminstration	Yes	Carlon, Scott
Northwest Power and Conservation Council	Yes	Horton, Stacy
Northwest Power and Conservation Council	Yes	Mounts, Sara
State Attorney General Office	No	Kirigin, Lauren
Upper Columbia Salmon Recovery Board	Yes	Bowerman, Tracy
US Bureau of Reclamation	No	Archuleta, Shannon
US Bureau of Reclamation	Yes	Hoff, Gina
US Fish and Wildlife Service	No	Neibauer, Judy
US Fish and Wildlife Service	Yes	Gale, William
US Fish and Wildlife Service	Yes	Kokos, Sonja
US Fish and Wildlife Service	Yes	Lewis, Steve
US Fish and Wildlife Service	Yes	Nelle, R.D.
Washington State Department of Ecology	No	Oreiro, Tyson
Washington State Department of Ecology	Yes	Peterschmidt, Mark
Washington State Department of Ecology	Yes	Zimmerman, Breean
Washington State Department of Fish and Wildlife	No	Burgess, Dave
Washington State Department of Fish and Wildlife	Yes	Blank, Benjamin
Washington State Department of Fish and Wildlife	Yes	Heironimus, Laura
Washington State Department of Fish and Wildlife	Yes	Jackson, Chad
Washington State Department of Fish and Wildlife	Yes	Murdoch, Andrew
Washington State Department of Fish and Wildlife	Yes	Verhey, Patrick
Washington State Dept of Natural Resources	Yes	Huinker, James
Washington State Dept of Natural Resources	Yes	Preston, Cindy

Washington State Parks	No	Fielding, Andrew
Washington State Parks	No	Harris, Chelsea

MEETING SUMMARY:

Please see the agenda (linked below) for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review the Comments List prior to the April TWG meeting; share additional questions/comments to RIRelicensing@chelanpud.org (if interested)	4/12/22
TWG Members	Reach out to Kelsey/Kearns & West (krugani@kearnswest.com) if you have any input or questions on the TWG Guidelines or TWG process generally	Ongoing
TWG Members	Reach out to Chelan PUD (RIRelicensing@chelanpud.org) for more information on the topobathy lidar study.	Ongoing
Chelan PUD	Develop a Communications Plan for how the Rock Island HCP, public process for the Tumwater Dam, and the Rock Island Hydroelectric project will coordinate and share information, as needed.	4/12/22
Chelan PUD	Propose a baseline water quality study for TWG review in April	4/12/22
Chelan PUD	Propose a 2022 White Sturgeon long line study plan for TWG review in April (if possible)	4/12/22
Chelan PUD	Distribute 3/8/22 Fish & Aquatic TWG Meeting Summary	3/15/22
Chelan PUD	Distribute Comment List	3/15/22

KEY DISCUSSION POINTS:

KEY DISCUSSION POINTS
During the Tuesday, March 8th Fish & Aquatics TWG, the TWG reviewed the TWG Guidelines document and began to walk-through the Comments List providing clarity, questions, and other information on the following topics: Water Quality, White Sturgeon, Aquatic Invasive Species, Resident Fish, and Bull Trout.
At the next Fish & Aquatics TWG, which will be held Tuesday, April 12th from 8am – 5pm, the TWG will continue the discussion of the Comments List and cover the following topics: Pacific Lamprey, Native Mussels, as well as the topics initially discussed on March 8. Chelan PUD will also present the study plans for the baseline Water Quality study and the 2022 White Sturgeon long line study for TWG review.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
TWG Members shared questions regarding how the Rock Island Habitat Conservation Plan (HCP) process and Tumwater Dam public process will connect to the Rock Island relicensing. Questions and notes included that 1) new information may come up during the relicensing that would be helpful to share within the HCP, 2) questions about how the timeline of the HCP will align with the Rock Island and Rocky Reach license terms, and 3) that writing out how the processes will coordinate would be helpful.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Minutes	Presentation	2022-03-08 Fish & Aquatics TWG Presentation
Minutes	Comment List	2022-03-08 Fish & Aquatics Starting Stakeholder Comments
Agenda	Agenda	2022-03-08 Fish and Aquatic TWG Agenda

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: March 10, 2022
TIME: 8:00 a.m. – 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 595 229 347#

MEETING PURPOSE:

- Review and discuss the Wildlife & Botanical TWG Guidelines.
- Provide an overview of Wildlife & Botanical Comments List, including its purpose and how it was developed, and build understanding of how the Comments List will be reviewed and discussed within the TWG.
- Begin to walk-through the Comments List, by topic, gain clarity on comments, and share plans for one early study.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	Attendance	PARTICIPANT
American Rivers	No	Moran, Bridget
Beck Botanical Services	Yes	Beck, Katy
Bureau of Indian Affairs	No	Peone, Rudy
Chelan County Public Utility District No. 1	Yes	Cordell, Kelly
Chelan County Public Utility District No. 1	Yes	Pope, Von
Chelan County Public Utility District No. 1	Yes	Underwood, Alene
Chelan County Public Utility District No. 1	Yes	Shales, Matt
City of Wenatchee	Yes	Merrill, Laura
Confederated Tribes and Bands of Yakama Nation	Yes	Blodgett, David
Confederated Tribes and Bands of Yakama Nation	Yes	Ganuelas, Leon
Confederated Tribes and Bands of Yakama Nation	Yes	Harvey, Elaine

AGENCY/ORGANIZATION	Attendance	PARTICIPANT
Confederated Tribes and Bands of Yakama Nation	Yes	Nuetzmann, Mark
Confederated Tribes of the Colville Reservation	No	Whitney, Richard
Confederated Tribes of the Colville Reservation	Yes	Rushing, Sam
Confederated Tribes of the Umatilla Indian Reservation	No	Pitt, Joe
Individual	No	Hays, Steve
Kleinschmidt Associates	Yes	Denis, Nathalie
Northwest Power and Conservation Council	No	Horton, Stacy
Northwest Power and Conservation Council	Yes	Mounts, Sara
US Bureau of Land Management	Yes	Boyter, Molly
US Bureau of Land Management	Yes	Ellis, Erik
US Fish and Wildlife Service	No	Lewis, Steve
US Fish and Wildlife Service	No	Riggs, Randi
US Fish and Wildlife Service	Yes	Callaway, Tara
Washington State Department of Fish and Wildlife	No	Jeffreys, Emily
Washington State Department of Fish and Wildlife	Yes	Blank, Benjamin
Washington State Department of Fish and Wildlife	Yes	Verhey, Patrick
Washington State Dept of Natural Resources	No	Huinker, James
Washington State Dept of Natural Resources	Yes	Preston, Cindy
Washington State Parks	No	Fielding, Andrew
Washington State Parks	No	Harris, Chelsea

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review the Comments List prior to the April TWG meeting; share addition questions/comments to RIRelicensing@chelanpud.org (if interested)	4/14/22
TWG Members	Reach out to Kelsey/Kearns & West (krugani@kearnswest.com) if you have any input or questions on the TWG Guidelines or TWG process generally	Ongoing
TWG Members	Review draft RTE Plant Study plan, once distributed	Two Week Deadline
Chelan PUD	Distribute 3/10/22 Wildlife & Botanical TWG Meeting Summary	3/17/22

KEY DISCUSSION POINTS:

KEY POINTS
During the Thursday, March 10 Wildlife & Botanical TWG meeting, the TWG reviewed the TWG Guidelines document and began to walk-through the Comments List providing clarity, questions, and other information on Botanical and Wildlife topics. Chelan PUD provided an overview of the 2022 RTE Plant Study plan, including a draft list of species. The TWG discussed initial components and suggested adding the following species to the list: • *Rorippa columbiae* and *Rotala ramosior* (in Hanford Reach).
At the next Wildlife & Botanical TWG meeting, which will be held Thursday, April 14th from 8am – 12pm, the TWG will continue the discussion of the Comments List. Chelan PUD will also share next steps on the RTE Plant Study plan.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	Wildlife and Botanical TWG Agenda
Minutes	Presentation	Wildlife and Botanical Starting Stakeholder Comments
Minutes	Presentation	Draft RTE Plants Table
Minutes	Presentation	Wildlife & Botanical TWG Facilitator Slides

ROCK ISLAND RELICENSING
RECREATION & LAND USE TWG
MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: March 17, 2022
TIME: 8:00 a.m. – 5:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Review and discuss the Recreation & Land Use TWG Guidelines.
- Provide an overview of Recreation & Land Use Comments List, including its purpose and how it was developed, and build understanding of how the Comments List will be reviewed and discussed within the TWG.
- Begin to walk-through the Comments List, by topic and gain clarity on comments, and share plans for one early study.
- Confirm next steps.

PARTICIPANTS:

Agency/Organization	Participant	Attendance
American Rivers	Moran, Bridget	Yes
American Whitewater	O'Keefe, Thomas	Yes
Audubon Society	McCammon, Bruce	Yes
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Baker, Ryan	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No

City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Zumini, James	No
City of Rock Island	Laughlin, Brock	Yes
Complete the Loop Coalition	Burgoon, Peter	Yes
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metro Parks & Recreation	Brown, Charlie	Yes
Individual	Hays, Steve	Yes
Individual	King, John	Yes
Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Holmes, Nuria	Yes
Kleinschmidt Associates	Waters, Emily	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
Sustainable Wenatchee	Fischback, Jana	Yes
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Lewis, Steve	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Wenatchee Row and Paddle Club	Thorson, Eric	Yes

MEETING SUMMARY:

Please see the agenda (linked below) for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review the Comments List prior to the April TWG meeting; share additional questions/comments to RIRelicensing@chelanpud.org (if interested)	4/21/22
TWG Members	Reach out to Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG Guidelines or TWG process generally	Ongoing
TWG Members	Review draft Recreation Inventory Study Outline, once distributed	Two Week Deadline
Chelan PUD	Distribute 3/17/22 Recreation & Land Use TWG Meeting Summary	3/24/22
Chelan PUD	Provide more information on upcoming outreach around Tumwater Dam	4/21/22
Chelan PUD	Confirm if signs at any recreation sites in addition to Coyote Dunes currently have QR code content.	4/21/22
Chelan PUD	Coordinate in-person visits to recreation sites within the Rock Island project area for interested TWG members	5/19/22

KEY DISCUSSION POINTS:

KEY DISCUSSION POINTS
During the Thursday, March 17th Recreation & Land Use TWG, the TWG reviewed the TWG Guidelines document, reviewed existing amenities at recreation sites within the Rock Island project area, and began to walk-through the Comments List providing clarity, questions, and other information on Recreation and Land Use topics.
At the next Recreation & Land Use TWG, which will be held Thursday, April 21st from 8am – 12pm, the TWG will continue the discussion of the Comments List.
In addition to the documents listed below, the following resources were shared during the meeting: • From the Chelan PUD Team: o TWG Guidelines: https://chelanpudrelicensing.sharepoint.com/:b:/s/ChelanPUDRelicensing/EXsn-PGAMbZNnSWqEXPDSp0BnSPxR8RYKQyGkswSWm9RUQ

- Land Management Program: https://www.chelanpud.org/hydropower/licensing-and-compliance/land-management-plans
- From TWG members:
  - WSDOT Active Transportation initiative (Grant opportunities for enhancing trails specifically used for commuting to and from work): https://wsdot.wa.gov/construction-planning/statewide-plans/active-transportation-plan
  - Washington State University (WSU) Agents of Discovery app: https://extension.wsu.edu/chelan-douglas/youth/youthdevelopment/projects/aod/

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
TWG Members expressed interest in better understanding recreation amenities associated with the Rock Island project. Chelan PUD will explore arranging in-person visits to recreation sites within the Rock Island project area for interested TWG members.
TWG Members can connect with Seth Wendzel from WSU 4-H Group on learning more about their "Agents of Discovery" app.
Chelan PUD can consider digitizing the pre- and post-flood studies conducted in the late 1970s to early 1980s and sharing electronically.
Chelan PUD can bring a past issues list to review with TWG members at a future meeting.
Chelan PUD can confirm what processes deal with land management at facilities other than Rock Island (e.g., Tumwater, Chiwawa, Diversion).

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	Rock Island Relicensing Recreation & Land Use TWG Agenda
Minutes	Presentation	Recreation and Land Use Starting Stakeholder Comments
Minutes	Presentation	Recreation and Land Use Facilitator Slides

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: April 12, 2022
TIME: 8:00 a.m. – 4:30 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Discuss the draft 2022 White Sturgeon Population Index Study Plan and status update on the draft Baseline Water Quality Monitoring Study Plan.
- Begin to walk through the Comments List and gain clarity on comments for Pacific Lamprey.
- Evaluate comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for Bull Trout, White Sturgeon, Resident Fish, and Water Quality, as time permits.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	ATTENDANCE	PARTICIPANT
American Rivers	Yes	Bridget Moran
BIA	No	Keith Hatch
Blue Leaf	Yes	Corey Wright
Blue Leaf	No	Dave Robichaud
Cascade Fisheries	No	Jason Lundgren
Chelan PUD	Yes	Alene Underwood
Chelan PUD	Yes	Ben Truscott
Chelan PUD	Yes	Brian Odell
Chelan PUD	Yes	Catherine Willard
Chelan PUD	Yes	Janel Ulrich
Chelan PUD	Yes	Lance Keller
Chelan PUD	Yes	Marcie Clement

AGENCY/ORGANIZATION	ATTENDANCE	PARTICIPANT
Chelan PUD	Yes	Scott Hopkins
Chelan PUD	Yes	William Towey
Colville	No	Bret Nine
Colville	No	Casey Baldwin
Colville	No	Douglas Marconi
Colville	Yes	Jason McLellan
Colville	Yes	Kirk Truscott
Confluence Environmental Company	No	Eric Doyle
CRITFC	No	Lauri Porter
CTUIR	No	Aaron Jackson
CTUIR	No	Audie Huber
CTUIR	No	Brent Hall
DNR	Yes	Cindy Preston
DNR	Yes	James Huinker
Ecology	Yes	Mark Peterschmidt
Ecology	No	Tyson Oreiro
Ecology	Yes	Breean Zimmerman
Four Peaks	Yes	Pradeep Mungunthan
Four Peaks	Yes	Joe Miller
Golder	Yes	Paul Grutter
Individual	Yes	Steve Hays
Kleinschmidt	Yes	Kai Steimle
Kleinschmidt	Yes	Audrey Thompson
Kleinschmidt	Yes	MaryLouise Keefe
Kleinschmidt	Yes	Nathalie Denis
NOAA	No	Justin Yeager
NOAA	Yes	Scott Carlon
NPCC	No	Stacy Horton
NPCC	Yes	Sara Mounts
UCSRB	Yes	Tracy Bowerman
USBR	No	Gina Hoff
USFWS	No	Judy Neibauer
USFWS	No	Steve Lewis
USFWS	Yes	R.D. Nelle
USFWS	Yes	Sonja Kokos
USFWS	Yes	William Gale
WA-Parks	No	Andrew Fielding
WA-Parks	No	Chelsea Harris
WDFW	No	Benjamin Blank
WDFW	Yes	Dave Burgess

AGENCY/ORGANIZATION	ATTENDANCE	PARTICIPANT
WDFW	Yes	Laura Heironimus
WDFW	Yes	Andrew Murdoch
WDFW	Yes	Chad Jackson
WDFW	Yes	Patrick Verhey
Yakama Nation	No	Brandon Rogers
Yakama Nation	No	Donella Miller
Yakama Nation	Yes	Ralph Lampman
Yakama Nation	No	Tom Iverson
Yakama Nation	Yes	David Blodgett
Yakama Nation	Yes	Elaine Harvey
Yakama Nation	Yes	Keely Murdoch

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review Comment List prior to the May 10, 2022 meeting to consider additional details and potential issues statements.	Prior to 5/10/22
TWG Members	Reach out to Marcie Clement (Marcie.Clement@chelanpud.org) with any questions on Mussels sampling efforts.	Ongoing
TWG Members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org) and/or Kelsey/Kearns & West (krugani@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for and participating in the TWG meetings.	Ongoing
Chelan PUD	Share a draft White Sturgeon Population Indexing Study Plan for TWG review prior to May 10, 2022 meeting.	Prior to 5/10/22
Chelan PUD	Coordinate with Jason McLellan (CTCR), Paul Grutter (WSP Golder), and Laura Heironimous (WDFW) for White Sturgeon data.	Prior to 5/10/22
Chelan PUD	Provide additional details on current project operations, specifically related to the White Sturgeon comments and discussion.	5/10/22
Chelan PUD	Consider how the Rock Island relicensing can evaluate cumulative impacts across other projects in the area.	5/10/22
Chelan PUD	Keep the Fish & Aquatic TWG in the loop on baseline water quality work.	Ongoing
Chelan PUD	Schedule more time to discuss Related Chelan PUD Efforts during the May 10, 2022 meeting.	5/10/22
Chelan PUD	Share information about Tumwater Dam Open House to be held on May 19, 2022.	Prior to 5/10/22
Chelan PUD	Share Project Area Map during the May 10, 2022 meeting.	5/10/22

KEY DISCUSSION POINTS:

KEY DISCUSSION POINTS
During the Tuesday, April 12 Fish & Aquatics TWG, the TWG reviewed the Action Items list from the March Fish & Aquatics TWG meeting, received updates from Chelan PUD on related efforts, and began to walk through the Comments List providing clarity, questions, and other information on Pacific Lamprey. The TWG also continued to evaluate comments for potential issue statements for Bull Trout, White Sturgeon, Resident Fish, and Water Quality. The TWG provided initial input and questions on the 2022 White Sturgeon long line study plan and will review the draft study plan in May 2022.
At the next Fish & Aquatics TWG, which will be held Tuesday, May 10 from 8 a.m. – 5 p.m., the TWG will continue the discussion of the Comments List, likely circling back to topics discussed during the March and April meetings. The Chelan PUD Team will also review the project map/boundaries during the May meeting.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
TWG Members shared questions regarding how the Rock Island Habitat Conservation Plan (HCP) process, the Tumwater Dam public process, the Chiwawa Weir, and the Dryden and Tumwater fishways will connect to the Rock Island relicensing. Chelan PUD shared that there will be a standing agenda item to discuss these topics at Fish & Aquatic TWG meetings, and that comments and questions related to these topics will be captured in the Fish & Aquatic TWG "parking lot". The TWG requested more time to discuss these topics in future meetings to build understanding and share questions and input.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Meeting Agenda	2022-04-12 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-04-12 Fish & Aquatics TWG Facilitator Slides

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: April 14, 2022
TIME: 8:00 a.m. – 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 595 229 347#

MEETING PURPOSE:

- Discuss the draft 2022 RTE Plants Study Plan.
- Evaluate comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for Botanicals and Wildlife topics, as time permits
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	
Audubon Society	McCammon, Bruce	
Audubon Society	Johnston, Mark	Yes
Beck Botanical Services	Beck, Katy	Yes
Bureau of Indian Affairs	Peone, Rudy	Yes
Chelan County	Pfleeger, Adam	
Chelan County	Julie Sanderson	Yes
Chelan County Public Utility District No. 1	Cordell, Kelly	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	Yes
Confederated Tribes of the Colville Reservation	Rushing, Sam	
Confederated Tribes of the Colville Reservation	Whitney, Richard	
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	
Individual	Hays, Steve	Yes
Kearns & West	Day, Mary Beth	
Kearns & West	Hessenius, Angela	
Kearns & West	Dahlin, Ariella	Yes
Kearns & West	Downing, Jim	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Waters, Emily	Yes
Northwest Power and Conservation Council	Horton, Stacy	Yes
Northwest Power and Conservation Council	Mounts, Sara	Yes
US Bureau of Land Management	Boyter, Molly	
US Bureau of Land Management	Ellis, Erik	
US Fish and Wildlife Service	Lewis, Steve	
US Fish and Wildlife Service	Riggs, Randi	
US Fish and Wildlife Service	Callaway, Tara	Yes
Washington Native Plant Society	Ballinger, Susan	
Washington State Department of Fish and Wildlife	Blank, Benjamin	
Washington State Department of Fish and Wildlife	Jeffreys, Emily	
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Huinker, James	
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Fielding, Andrew	
Washington State Parks	Harris, Chelsea	

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org or Kelsey/Kearns & West (krugani@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
TWG Members	Review Comment List prior to the May 12, 2022 meeting to consider additional details and potential issues statement.	Prior to 5/12/22
Chelan PUD	Provide written responses to TWG comments on the draft RTE Plant Study plan.	End of April
Chelan PUD	Begin conducting the RTE Plant Study in early May, coordinate with the Washington Natural Heritage Program, and notify the TWG of any species found not that are not currently included in the species list.	Early May
Chelan PUD	Review comment list and follow-up on outstanding questions/gaps/references, including reaching out to Washington Department of Fish and Wildlife on waterfowl surveys.	Prior to 5/12/22 and Ongoing
Chelan PUD	Continue discussing water quality topics, coordinating with the Fish & Aquatics TWG, and exploring the connections and potential impacts to wildlife (i.e., looking at the Rock Island ponds).	Ongoing
Chelan PUD	Add Mark Johnston, Audubon Society, to the Fish & Aquatics TWG distribution list.	Prior to 5/10/22
Chelan PUD	Circulate final April 14th Wildlife & Botanicals TWG meeting summary and reattach the Comments List.	4/18/22
Chelan PUD	Review the Fish and Wildlife Coordination Act and consider additional species that are not ESA listed, including reaching out to federal agencies to gather more information.	5/12/22

KEY DISCUSSION POINTS:

KEY DISCUSSION POINTS
During the Thursday, April 14th Wildlife & Botanicals TWG, the TWG reviewed, discussed input, and confirmed next steps on the draft RTE study plan. The TWG continued to evaluate comments for potential issue statements, adding details and input on Botanical and Wildlife topics.
At the next Wildlife & Botanicals TWG, which will be held Thursday, May 12th from 8 a.m. – 12 p.m., the TWG will continue the discussion of the Comments List, likely circling back to topics discussed during the March and April meetings and starting to draft issue statements.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
Discuss Chelan PUD landholdings within and adjacent to the Project Boundary and consider opportunities, from a riparian habitat perspective, for future use (i.e., revisiting the parcels that are leased for orchard management) and/or potential PM&E measures.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-04-14 Wildlife and Botanical TWG Agenda
Minutes	Presentation	2022-04-14 Wildlife & Botanical TWG Facilitator Slides

ROCK ISLAND RELICENSING RECREATION & LAND USE MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: April 21, 2022
TIME: 8:15 a.m. – 12:00 p.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Evaluate comments for potential issue statement, considering project nexus and existing information, and formulate issue statement as appropriate for Recreation and Land Use topics, as time permits.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	Yes
American Whitewater	O'Keefe, Thomas	Yes
Audubon Society	McCammon, Bruce	Yes
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Baker, Ryan	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Laughlin, Brock	Yes
City of Rock Island	Zumini, James	No
City of Wenatchee	Merrill, Laura	No
Complete the Loop Coalition	Burgoon, Peter	No

Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Individual	Hays, Steve	Yes
Individual	King, John	Yes
Kearns & West	Dahlin, Ariella	Yes
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Downing, Jim	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kleinschmidt Associates	Waters, Emily	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
Kleinschmidt Associates	Harper, Matthew	No
Kleinschmidt Associates	Holmes, Nuria	No
Sustainable North Central Washington	Fischback, Jana	No
Sustainable North Central Washington	Qazi, Joan	No
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Lewis, Steve	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Washington State Parks	Patnode, Brian	No
Wenatchee Row and Paddle Club	Thorson, Eric	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review Comment List prior to the May 19, 2022 meeting to consider additional details and potential issues statements. Draft issue statements for discussion at the next TWG meeting.	Prior to 5/19/22
TWG Members	Reach out to Matt with suggestions for in-person recreation site visits.	5/19/22
TWG Members	Reach out to Matt or Mary Beth if interested in presenting on related topics/sharing relevant information at future TWG meetings.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
Chelan PUD	Circulate final April 21st Recreation & Land Use TWG meeting summary and reattach the Comments List.	4/28/22
Chelan PUD	Present on reservoir operations at a future TWG meeting.	TBD
Chelan PUD	Present an overview of the Land Management Program at future TWG meeting.	TBD
Chelan PUD	Share timeline for Wenatchee Confluence Bridge Project (see link in Key Discussion Points below).	Complete
Chelan PUD	As appropriate, draft issue statements and or provide responses to comments for discussion at the next TWG meeting.	Prior to 5/19/22 and Ongoing
Chelan PUD	Coordinate in-person visits to recreation sites within the Rock Island project area	5/19/22
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing	Ongoing

	between groups.	
Chelan PUD	Circulate information on Tumwater Dam Open House to Patrick Verhey, WDFW	Complete

KEY DISCUSSION POINTS:

DECISIONS MADE
During the Thursday, April 21st Recreation & Land Use TWG, the TWG continued to evaluate comments for potential issue statements, adding details and input on Recreation and Land Use topics.
Interested TWG members are welcome to attend an Open House Meeting on Tumwater Dam on May 19 from 4 pm-7 pm at Leavenworth Fire Hall. The meeting purposes are: To educate the community about the value and current uses of Tumwater Dam, and 2) To better understand the community's perspectives on Tumwater Dam and surrounding areas. Independent of this outreach, Chelan PUD is planning a major maintenance project at Tumwater Dam to begin as early as 2023. The feedback collected will be considered for long-term planning, to ensure that the PUD's investment and stewardship associated with this asset is aligned with customer-owners' interests and values.
At the next Recreation & Land Use TWG, which will be held Thursday, May 19th from 8:15 a.m. – 12 p.m., the TWG will continue the discussion of the Comments List and start to draft issue statements.
The following resources were shared during the meeting: • Land Management Program: https://www.chelanpud.org/hydropower/licensing-and-compliance/land-management-plans • Confluence bridge project: https://www.wenatcheewa.gov/get-involved/confluence-parkway-in-wenatchee/confluence-parkway-environmental-assessment-updates. Click on link to Project Dashboard for NEPA timeline and other important information.
Chelan PUD plans to undertake three recreation studies: 1. Inventory 2. Use 3. Needs and Forecast

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
TWG members suggested tracking ideas for potential protection, mitigation, and enhancement (PM&E) measures. Tracking ideas could look like a bulleted list of future ideas/concerns per comment and/or issue statements. These notes will capture what is intended by this TWG at this time during this multi-year process and can serve as a record to refer to in the future. For example, once Chelan PUD completes the Need and Forecast Study, these notes can be referenced for discussing enhancement measures like a Horan Natural Area outdoor education/classroom space.

TWG members shared questions about project operations, including: Would relicensing look at changing project operations? Could maximum or minimum pool levels change as a result of relicensing?

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-04-21 Recreation TWG Agenda
Minutes	Presentation	2022-04-21 Recreation & Land Use TWG Facilitator Slides
Minutes	Reference Doc	POST FLOOD WILDLIFE INVENTORY-RI Hydroelectric Project.pdf
Minutes	Reference Doc	PRE FLOOD WILDLIFE INVENTORY_RI Hydroelectric Project.pdf

ROCK ISLAND RELICENSING
FISH AND AQUATIC

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: May 10, 2022
TIME: 8:30 a.m. – 3:30 p.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Discuss the upcoming draft 2022 White Sturgeon Population Index Study Plan and the draft 2022 Water Quality Monitoring Study Plan.
- Evaluate comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for White Sturgeon, Water Quality, Resident Fish, and Pacific Lamprey.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Bridget Moran	No
AttyGenWA	Lauren Kirigin	No
Audubon Society	Mark Johnston	Yes
BIA	Keith Hatch	No
Blue Leaf	Dave Robichaud	No
Blue Leaf	Corey Wright	Yes
Cascade Fisheries	Jason Lundgren	No
Chelan County	Julie Sanderson	No
Chelan PUD	Catherine Willard	No
Chelan PUD	Alene Underwood	Yes
Chelan PUD	Ben Truscott	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan PUD	Brian Odell	Yes
Chelan PUD	Janel Ulrich	Yes
Chelan PUD	Kate Taylor	Yes
Chelan PUD	Lance Keller	Yes
Chelan PUD	Marcie Clement	Yes
Chelan PUD	Scott Hopkins	Yes
Chelan PUD	William Towey	Yes
City of Rock Island	Brock Laughlin	No
Colville	Bret Nine	No
Colville	Casey Baldwin	No
Colville	Douglas Marconi	Yes
Colville	Jason McLellan	Yes
Colville	Kirk Truscott	Yes
Confluence Environmental Company	Eric Doyle	Yes
CRITFC	Blaine Parker	No
CRITFC	Diane Barton	No
CRITFC	Julie Carter	Yes
CRITFC	Lauri Porter	Yes
CRITFC	Tom Skiles	Yes
CTUIR	Aaron Jackson	No
CTUIR	Audie Huber	No
CTUIR	Brent Hall	No
DNR	Cindy Preston	Yes
DNR	James Huinker	Yes
Ecology	Mark Peterschmidt	No
Ecology	Tyson Oreiro	No
Ecology	Breean Zimmerman	Yes
Four Peaks	Leah Nagel	No
Four Peaks	Joe Miller	Yes
Four Peaks	Pradeep Mugunthan	Yes
Golder	Paul Grutter	No
Individual	Steve Hays	No
Kleinschmidt	MaryLouise Keefe	No
Kleinschmidt	Audrey Thompson	Yes
Kleinschmidt	Emily Waters	Yes
Kleinschmidt	Kai Steimle	Yes
Kleinschmidt	Nathalie Denis	Yes
KW	Mary Beth Day	No
KW	Angela Hessenius	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
KW	Jim Downing	Yes
KW	Kelsey Rugani	Yes
NOAA	Justin Yeager	No
NOAA	Scott Carlon	Yes
NPCC	Stacy Horton	No
NPCC	Sara Mounts	Yes
UCSRB	Tracy Bowerman	No
USBR	Shannon Archuleta	No
USBR	Gina Hoff	Yes
USFWS	Kenneth Muir	No
USFWS	Steve Lewis	No
USFWS	Judy Neibauer	Yes
USFWS	R.D. Nelle	Yes
USFWS	Sonja Kokos	Yes
USFWS	William Gale	Yes
WA-Parks	Andrew Fielding	No
WA-Parks	Chelsea Harris	No
WDFW	Benjamin Blank	No
WDFW	Chad Jackson	No
WDFW	Dave Burgess	No
WDFW	Andrew Murdoch	Yes
WDFW	Laura Heironimus	Yes
WDFW	Patrick Verhey	Yes
YN	Brandon Rogers	No
YN	David Blodgett	No
YN	Donella Miller	No
YN	Elaine Harvey	Yes
YN	Keely Murdoch	Yes
YN	Ralph Lampman	Yes
YN	Tom Iverson	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Reach out to Rachel Hansen (rachel.hansen@chelanpud.org) for more information on May 19 Open House on Tumwater Dam.	5/19/2022
TWG Members	Review updated Comment Matrix, looking into more information, and thinking through/drafting potential issue statements.	6/14/2022
TWG Members	Begin to think through methodology of potential future studies, as appropriate.	Ongoing
Chelan PUD	Double-check invite list for May 19 Open House on Tumwater Dam to make sure TWG members received the information (e.g., survey, website, etc.). The Open House will take place at Chelan County Fire District 3 in Leavenworth from 4:00 – 7:00pm.	5/11/2022
Chelan PUD	Share presentation and notes from Rock Island Hydroelectric Project Operations Overview.	5/16/2022
Chelan PUD	Circulate final meeting summary from May 10 TWG meeting.	5/16/2022
Chelan PUD	Add Wenatchee Confluence Bridge to the Related Chelan PUD Efforts agenda topic at the June meeting.	5/31/2022
Chelan PUD	Circulate draft 2022 White Sturgeon Population Index Study Plan for TWG review (2 week/10 business day review period).	5/31/2022
Chelan PUD	Update Comment Matrix, including draft issues statements discussed at the May 10 TWG meeting, and circulate to TWG prior to the June TWG meeting.	5/31/2022
Chelan PUD	Define applicable Water Quality standards for the Rock Island hydroelectric project to help inform development of issues statements.	6/14/2022
Chelan PUD	Consider Tribal Water Quality standards in the Rock Island relicensing process.	Ongoing
Chelan PUD	Circulate draft 2022 Water Quality Monitoring Study Plan, including a Quality Assurance Project Plan, for TWG review (2 week/10 business day review period) in June.	6/30/2022
Chelan PUD	Continue to update TWG on Native Mussels in future meetings and will coordinate with USFWS on methodology.	Ongoing

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, May 10 Fish & Aquatics TWG, the TWG reviewed the Action Items list from the April Fish & Aquatic TWG meeting, received updates from Chelan PUD on related efforts, and heard a presentation on Rock Island operations. TWG members suggested discussing the following topics at upcoming meetings: Rock Island HCP, NPDES, 401 permit, Hanford Reach operations and requirements, reacting to operational changes from Chief Joseph/Grand Coulee dam (i.e., range of those types of operations), and defining baseline conditions for FERC in comparison to ESA consultation.
The bulk of the May 10 meeting focused on the Comment Matrix where the TWG continued evaluating comments and started drafting and discussing potential issue statements for White Sturgeon, Water Quality, Resident Fish, and Pacific Lamprey. The TWG also continued discussing the draft 2022 White Sturgeon Population Index Study Plan and the 2022 Water Quality Monitoring Study Plan.
At the next Fish & Aquatic TWG, which will be held Tuesday, June 14 from 8:30 a.m. – 3:30 p.m., the TWG will continue working through the Comment Matrix and potential issue statements, likely focusing on Bull Trout, Water Quality and Aquatic Invasive Species. The Chelan PUD Team will also share relevant updates from the Rock Island HCP Committee and provide additional background or education on the Rock Island project.

PARKING LOT ITEMS:

PARKING LOT ITEMS
None

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Minutes	Presentation	2022-05-10 Fish and Aquatics TWG Facilitator Slides
Minutes	Presentation	2022 May Operations Information Presentation
Agenda	Agenda	2022-05-10 Fish and Aquatic TWG Agenda
Agenda	Video	RI Project Operation Video
Minutes	Comments	2022-05-10 F&A TWG Comment Matrix Notes Fish
Minutes	Comments	2022-05-10 F&A TWG Comment Matrix Notes WQ

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: May 12, 2022
TIME: 8:00 a.m. – 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 595 229 347#

MEETING PURPOSE:

- Share information on Rock Island project: project map and operations presentation.
- Evaluate comments on Botanical and Wildlife topics for potential issue statements, considering project nexus and existing information; review and edit issue statements as appropriate.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	Yes
Audubon Society	McCammon, Bruce	No
Beck Botanical Services	Beck, Katy	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Cordell, Kelly	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
City of Wenatchee	Merrill, Laura	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	Yes
Chelan County Public Utility District No. 1	Garrison, Dan	Yes
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	Yes
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	No
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Individual	Hays, Steve	No
Kearns & West	Dahlin, Ariella	Yes
Kearns & West	Downing, Jim	Yes
Kearns & West	Day, Mary Beth	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Waters, Emily	Yes
Northwest Power and Conservation Council	Horton, Stacy	Yes
Northwest Power and Conservation Council	Mounts, Sara	No
US Bureau of Land Management	Clark, Linda	No
US Bureau of Land Management	Clark, Lisa	No
US Bureau of Land Management	Ellis, Erik	No
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Lewis, Steve	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington Native Plant Society	Ballinger, Susan	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Dept of Natural Resources	Huinker, James	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org or Jim/Kearns & West (jdowning@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	6/9/2022
TWG members	Review Comment List prior to the June 9 meeting to consider additional details and potential issues statement.	6/9/2022
Mark Johnston	Reach out to possible author of comment WIL-05 (effects of water level fluctuation on riparian and wetlands) re: attending next TWG meeting	(email sent 5/12/2022)
Chelan PUD	Circulate May 12 Wildlife & Botanical TWG meeting summary.	5/18/2022
Chelan PUD	Update the Comment Matrix to reflect the May Wildlife & Botanical TWG discussion and circulate to the TWG prior to June meeting.	6/9/2022
Chelan PUD	Seek USFWS input on issue statements concerning Ute ladies' tresses (comments WIL-02, WIL-08)	Ongoing
Chelan PUD	Re: comment WIL-12 (avian habitat at RI Ponds and Horan area): crosswalk with other TWGs on water quality, habitat, recreation dimensions; provide update at next meeting	Ongoing
Chelan PUD (Kelly)	Provide update on chemicals used at Home Water.	6/9/2022
Chelan PUD (Ben)	Post written responses to the comments on the RTE Plants Study Plan (Ben)	6/9/2022

KEY DISCUSSION POINTS:

KEY DISCUSSION POINTS
During the May 12 Wildlife & Botanicals, the TWG evaluated comments and reviewed draft issue statements, adding details and input on Botanical and Wildlife topics.
Botanical
The following comments were discussed, with changes to issue statements noted: WIL-02/WIL-08 (Ute ladies' tresses and other RTE species): Issue Statement Complete, pending input from USFWS.
WIL-03 (Transmission line ROW): Discussed, no change in status; update next meeting on chemicals used at Home Water.
WIL-18 (restore unused trails): Discussed, agreed that No Issue Statement Needed (issue is already being addressed)
WIL-05, WIL-04 (effects of water level fluctuation on riparian and wetland species, including Black Cottonwood): Discussed; no specific impacts of project operations were identified; members present agreed No Issue Statement Needed, but will keep this item open for input at future meetings.
Wildlife
WIL-18 (Home Water Preserve Winter Closure): TWG members agreed No Issue Statement Needed; issue is covered by existing requirements.
WIL-16/17 (Waterfowl surveys): Discussed. Survey data collection ongoing, but at this point no project impacts identified. TWG members agreed No Issue Statement Needed.
WIL-15 (Raptors): Discussed. Populations appear to be increasing; no project impacts identified; will monitor water quality issue evaluation that is underway in Fish & Aquatics TWG. TWG agreed No Issue Statement Needed.
WIL-08 (RTE animal species): Discussed. Issue was addressed in the PID and will be addressed robustly in the PAD. TWG agreed No Issue Statement Needed.
WIL-09 (Fish and Wildlife Coordination Act): Discussed. USFWS is required to do consultation under the Act. Status changed to More Discussion Needed – Later.
WIL-10 (Yellow-billed cuckoo): Discussed, agreed that existing information indicates that species is not present in Project area; TWG agreed No Issue Statement Needed.
WIL-12 (Bird habitat at Rock Island Ponds and Horan): Discussed. Status changed to More Discussion Needed – Later. More clarification needed on potential project impacts; crosswalk with other TWGs on water quality and recreation issues at these sites.
At the next Wildlife & Botanicals TWG, which will be held Thursday, June 9th from 8 a.m. – 12 p.m., the TWG will continue the discussion of the Comments List, likely circling back to topics discussed during the March, April and May meetings and start to draft issue statements.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
[No new parking lot items]

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-05-12 Wildlife and Botanical TWG Agenda
Agenda	Video	RI Project Operation Video
Minutes	Presentation	2022 May Operations Information Presentation
Minutes	Presentation	2022-05-12 Wildlife & Botanical TWG Facilitator Slides
Minutes	Study Plan	RI Study Plan RTE Plants
Minutes	Comments	2022 May Stakeholder Comment Matrix - Wildlife and Botanical

ROCK ISLAND RELICENSING RECREATION & LAND USE MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: May 19, 2022
TIME: 8:15 a.m. – 12:00 p.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Evaluate comments for potential issue statement, considering project nexus and existing information, and formulate issue statement as appropriate for Recreation and Land Use topics, as time permits.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	McCammon, Bruce	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Baker, Ryan	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Garrison, Dan	Yes
Chelan County Public Utility District No. 1	Griffin, Vicki	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No

City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Laughlin, Brock	Yes
City of Rock Island	Zumini, James	No
City of Wenatchee	Merrill, Laura	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Individual	Hays, Steve	No
Individual	King, John	Yes
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Harper, Matthew	No
Kleinschmidt Associates	Waters, Emily	No
Kleinschmidt Associates	Whelpley, Angela	Yes
Kleinschmidt Associates	Oswald, Fatima	Yes
SWCA Environmental Consultants	Holmes, Nuria	Yes
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	Yes
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Lewis, Steve	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Washington State Parks	Patnode, Brian	No
Wenatchee Row and Paddle Club	Thorson, Eric	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Eric Thorson, Wenatchee Row and Paddle Club	Reach out to Peter Burgoon, Complete the Loop Coalition, re: speaking at the June 16 recreation site visit	6/1/2022
TWG Members	Reach out to Matt with additional ideas or suggestions for the June 16 recreation site visit.	6/1/2022
TWG Members	Review updated Comment Matrix, prior to the July 21st meeting to consider additional details and potential responses to comments.	7/21/2022
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
TWG Members	Reach out to Matt or Mary Beth if interested in presenting on related topics/sharing relevant information at future TWG meetings.	Ongoing
Chelan PUD	Share presentation and notes from Rock Island Hydroelectric Project Operations Overview.	5/26/2022
Chelan PUD	Circulate final May 19th Recreation & Land Use TWG meeting summary.	5/26/2022
Chelan PUD	Update Comment Matrix to reflect the May 19 TWG meeting and circulate to TWG.	5/26/2022
Chelan PUD	Invite the City of Wenatchee to join the June 16 recreation site visit and be available to answer questions.	6/2/2022
Chelan PUD	Circulate additional details about the June 16 recreation site visit.	6/2/2022
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing

KEY DISCUSSION POINTS

DECISIONS MADE
During the Thursday, May 19th Recreation & Land Use TWG, the TWG reviewed the Action Items list from the April Recreation & Land Use TWG meeting, reviewed the project map and discussed plans for the June site visit, and heard a presentation on Rock Island operations.
In addition, the TWG continued to review comments on Recreation and Land Use topics and discussed proposed responses to comments from Chelan PUD.
TWG members identified a new Recreation comment focused on understanding needs around cycle commuting, particularly along the Apple Capital Loop Trail.
All Land Use comments are currently assigned a status of "No Issue Statement Needed" or will be transferred to another TWG. Therefore, the Recreation & Land Use TWG will focus on Recreation topics for the time being.
The following resources were shared during the meeting: • Land Management Program: https://www.chelanpud.org/hydropower/licensing-and-compliance/land-management-plans
The next Recreation & Land Use TWG, which will be held Thursday, June 16th, from 9:00 a.m. – 12:30 p.m., will be an in-person site visit focused solely on recreation. Regular TWG meetings will resume on Thursday, July 21st from 8:15 a.m. – 12:00 p.m.

PARKING LOT ITEMS:

NEW PARKING LOT ITEMS
TWG members expressed interest in revisiting a discussion around the potential effects of the City of Wenatchee's Confluence Parkway project after the completion of its NEPA process.
Chelan PUD to consider sharing updates, as appropriate, on their coordination with the City of Wenatchee regarding providing treated stormwater into the Horan Natural Area.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-05-19 Recreation and Land Use TWG Agenda.pdf
Agenda	Presentation	2022-03-08 Recreation and Land Use Starting Stakeholder Comments.pdf
Agenda	Video	RI Project Operation Video.mp4
Minutes	Presentation	2022 May Operation Information Presentation
Minutes	Presentation	2022-05-19 Recreation & Land Use TWG Facilitator Slides
Minutes	Comments	2022 May Stakeholder Comment Matrix – Recreation & Land Use

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: June 9, 2022
TIME: 8:30 a.m. – 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 595 229 347#

MEETING PURPOSE:

- Share information on the Early Engagement process,
- Evaluate comments on Botanical and Wildlife topics for potential issue statements, considering project nexus and existing information; review and edit issue statements as appropriate.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Audubon Society	McCammon, Bruce	Yes
Beck Botanical Services	Beck, Katy	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Cordell, Kelly	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
City of Wenatchee	Merrill, Laura	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan County Public Utility District No. 1	Garrison, Dan	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	Yes
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Individual	Hays, Steve	No
Kearns & West	Dahlin, Ariella	Yes
Kearns & West	Downing, Jim	Yes
Kearns & West	Day, Mary Beth	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Kennedy, Katy	Yes
Kearns & West	Rugani, Kelsey	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Waters, Emily	No
Northwest Power and Conservation Council	Horton, Stacy	Yes
Northwest Power and Conservation Council	Mounts, Sara	Yes
US Bureau of Land Management	Clark, Linda	No
US Bureau of Land Management	Clark, Lisa	No
US Bureau of Land Management	Ellis, Erik	No
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Lewis, Steve	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington Native Plant Society	Ballinger, Susan	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda and Key Discussion Points, below, for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org or Jim/Kearns & West (jdowning@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	7/14/2022
TWG members	Review Comment List prior to the July 14 meeting to consider additional details and potential issues statement.	7/14/2022
Chelan PUD	Circulate June 9 Wildlife & Botanical TWG meeting summary.	6/15/2022
Chelan PUD	Update Comment Matrix to reflect the June Wildlife & Botanical TWG discussion and circulate to the TWG prior to July meeting.	7/14/2022
Chelan PUD	Seek USFWS input on issue statements concerning Ute ladies' tresses (comments WIL-02, WIL-08).	6/15/2022
Chelan PUD	Crosswalk with other TWGs on water quality relevant to W&B comments.	Ongoing
Chelan PUD (Kelly)	Send updated information on chemical use at Home Water with meeting summary.	6/15/2022
Chelan PUD	Using aerial imagery, identify populations of Black Cottonwood in the project area; provide update on this work at next meeting.	7/14/2022
Chelan PUD	Provide regular updates on the status of pending studies and reviews that will help to inform discussions of project effects and project nexus for W&B issues. These efforts include the avian predation study, the primary transmission line avian summary, and the Rock Island pool fluctuation model.	Ongoing

KEY DISCUSSION POINTS

KEY POINTS
At the June 9 Wildlife & Botanicals meeting, the TWG evaluated comments and reviewed draft issue statements, adding details and input on Botanical and Wildlife topics.
Wildlife
WIL-11 (impacts on moose, wolves, bears): Moose is the only one of these species present; no project effect on moose identified. Status changed to No Issue Statement Needed.
WIL-03 (effects of the transmission line right-of-way management practices on wildlife). No project effect identified. Status changed to No Issue Statement Needed.
WIL-12 (effects on the project on wetland plant communities at Rock Island ponds, effects on waterfowl and amphibian habitat). More information on water quality needed (which is being discussed in Fish & Aquatics TWG). Status remained More Discussion Needed – Later.
WIL-22 (potential effects on wildlife at Porter's Pond). No project effect identified. Status changed to No Issue Statement Needed.
WIL-14 (avian predation of fish). Revisit in fall after report results are available. Status remained More Discussion Needed – Later.
WIL-01 (transmission line avian hazards). Falls under existing Avian Protection Plan. Will revisit when report results are available. Status remained More Discussion Needed – Later.
Botanicals
The following comments were discussed, with changes to issue statements noted:
WIL-16/17 (pool level fluctuations impact on marsh and wetland habitat): Need results of pool fluctuation study to evaluate project nexus. Status changed to More Discussion Needed – Later.
WIL-04 (regeneration of Black Cottonwood). Need results of pool fluctuation study to evaluate project nexus. Need information on Black Cottonwood population locations (Chelan will review aerial imagery). Status changed to More Discussion Needed – Later.
WIL-12 (effects of the Project on wetland plant communities at Horan). Need results of pool fluctuation study to evaluate project nexus. Status changed to More Discussion Needed – Later.
WIL-13 (Potential impact of actions outside of relicensing – effects on mitigation lands; potential impacts to wetlands in the Horan). No project nexus. Status changed to No Issue Statement Needed.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-06-09 Wildlife and Botanical TWG Agenda
Minutes	Presentation	2022-06-09 Wildlife & Botanical TWG Facilitator Slides
Minutes	Report	RI Herbicides and Label Requirements
Minutes	Comments	2022 June Stakeholder Comment Matrix - Wildlife and Botanical

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: June 14, 2022
TIME: 8:30 a.m. – 3:30 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Evaluate comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for Bull Trout, Water Quality, and Aquatic Macrophytes.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Bridget Moran	No
Attorney General WA	Lauren Kirigin	No
Audubon Society	Mark Johnston	Yes
Bureau of Indian Affairs	Keith Hatch	No
Blue Leaf	Corey Wright	No
Blue Leaf	Dave Robichaud	No
Cascade Fisheries	Jason Lundgren	No
Chelan County	Julie Sanderson	No
Chelan PUD	Alene Underwood	Yes
Chelan PUD	Ben Truscott	Yes
Chelan PUD	Brian Odell	Yes
Chelan PUD	Catherine Willard	No
Chelan PUD	Janel Ulrich	No
Chelan PUD	Kate Taylor	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan PUD	Lance Keller	Yes
Chelan PUD	Marcie Clement	Yes
Chelan PUD	Scott Hopkins	Yes
Chelan PUD	William Towey	Yes
City of Rock Island	Brock Laughlin	No
Colville Tribe	Bret Nine	No
Colville Tribe	Casey Baldwin	No
Colville Tribe	Douglas Marconi	No
Colville Tribe	Jason McLellan	Yes
Colville Tribe	Kirk Truscott	Yes
Confluence Environmental Company	Eric Doyle	No
Columbia River Inter Tribal Fish Commission	Blaine Parker	No
Columbia River Inter Tribal Fish Commission	Diane Barton	No
Columbia River Inter Tribal Fish Commission	Julie Carter	No
Columbia River Inter Tribal Fish Commission	Lauri Porter	No
Columbia River Inter Tribal Fish Commission	Tom Skiles	Yes
Confederated Tribes of the Umatilla Indian Reservation	Aaron Jackson	No
Confederated Tribes of the Umatilla Indian Reservation	Audie Huber	No
Confederated Tribes of the Umatilla Indian Reservation	Brent Hall	No
DNR	Cindy Preston	No
DNR	James Huinker	No
Ecology	Breean Zimmerman	Yes
Ecology	Mark Peterschmidt	Yes
Ecology	Tyson Oreiro	No
Four Peaks	Joe Miller	Yes
Four Peaks	Leah Nagel	No
Four Peaks	Pradeep Mugunthan	Yes
Golder	Paul Grutter	No
Individual	Steve Hays	No
Kleinschmidt	Audrey Thompson	No
Kleinschmidt	Emily Waters	Yes
Kleinschmidt	Kai Steimle	Yes
Kleinschmidt	MaryLouise Keefe	Yes
Kleinschmidt	Nathalie Denis	Yes
Kearns & West	Angela Hessenius	Yes
Kearns & West	Ariella Dahlin	No
Kearns & West	Jim Downing	No
Kearns & West	Katy Kennedy	No
Kearns & West	Kelsey Rugani	Yes
Kearns & West	Mary Beth Day	No
NOAA	Justin Yeager	No

Agency/Organization	Participant	Attendance
NOAA	Scott Carlon	No
NPCC	Sara Mounts	Yes
NPCC	Stacy Horton	No
UCSRB	Tracy Bowerman	No
USBR	Gina Hoff	Yes
USBR	Shannon Archuleta	No
USFWS	Judy Neibauer	Yes
USFWS	Kenneth Muir	No
USFWS	R.D. Nelle	Yes
USFWS	Sonja Kokos	Yes
USFWS	William Gale	No
WA-Parks	Andrew Fielding	No
WA-Parks	Chelsea Harris	No
WDFW	Andrew Murdoch	No
WDFW	Benjamin Blank	No
WDFW	Chad Jackson	Yes
WDFW	Dave Burgess	No
WDFW	Laura Heironimus	No
WDFW	Patrick Verhey	Yes
Yakama Nation	Brandon Rogers	No
Yakama Nation	David Blodgett	No
Yakama Nation	Donella Miller	No
Yakama Nation	Elaine Harvey	Yes
Yakama Nation	Keely Murdoch	Yes
Yakama Nation	Ralph Lampman	No
Yakama Nation	Tom Iverson	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Submit comments on the Draft 2022 White Sturgeon Population Index Study Plan.	6/27/22
TWG Members	Review updated Comment Matrix, looking into more information, and thinking through/drafting potential issue statements.	Ongoing
Chelan PUD	Consider how to frame discussions moving forward to clarify specific subtopics/categories for Aquatic Invasive Species (Aquatic Macrophytes, Benthic, and Invasive Fish/Northern Pike).	Ongoing
Chelan PUD	Circulate draft 2022 Water Quality Monitoring Study Plan, including a Quality Assurance Project Plan, for TWG review (2 week/10 business day review period).	6/24/22
Chelan PUD	Share the Washington State Department of Ecology presentation on the 401 Water Quality Certification process.	6/21/22
Chelan PUD	Consider how to pull together existing information that will support future TWG discussions.	Ongoing
Chelan PUD	Circulate final meeting summary from June 14 TWG meeting	6/21/22

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, June 14 Fish & Aquatic TWG, the TWG reviewed the Action Items list from the May Fish & Aquatic TWG meeting, received brief updates from Chelan PUD on related efforts, and heard an overview presentation of FERC's ILP process, schedule, and criteria.
The bulk of the June 14 meeting focused on the Comment Matrix where the TWG continued evaluating comments, reviewing potential issue statements, and having technical conversations related to existing information and study methodology for Bull Trout, Water Quality, and Aquatic Macrophytes.
Breean Zimmerman with the Washington Department of Ecology provided an overview of the U.S. Clean Water Act, Section 401 Water Quality Certification process.
At the next Fish & Aquatic TWG, which will be held Tuesday, July 12 from 8:30 a.m. – 3:30 p.m., the TWG will continue working through the Comment Matrix and potential issue statements. The Chelan PUD Team will also share relevant updates from the Rock Island HCP Committee and

KEY DISCUSSION ITEMS
provide additional background or education on the Rock Island project.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-06-14 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-06-14 Fish & Aquatic TWG Facilitator Slides
Minutes	Presentation	2022-06-14 Water Quality 401 Hydropower Presentation
Minutes	Comments	Comment Matrix – Bull Trout
Minutes	Comments	Comment Matrix – Water Quality
Minutes	Comments	2022 June Stakeholder Comment Matrix – Aquatic Macrophytes

ROCK ISLAND RELICENSING RECREATION & LAND USE MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: June 16, 2022
TIME: 9:00 a.m. – 12:30 p.m. Pacific Daylight Time (PDT)
LOCATION: Walla Walla Point Park - Shelter #1 (closest to playground)

MEETING PURPOSE:

- Meet in person
- Visit existing recreation sites commonly discussed in TWG meetings

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	McCammon, Bruce	Yes
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Taylor, Kate	No
Chelan County Public Utility District No. 1	Ulrich, Janel	No
Chelan County Public Utility District No. 1	Heit, Ray	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Zumini, James	No
City of Rock Island	Laughlin, Brock	Yes

City of Wenatchee	Gloria, Laura	Yes
Complete the Loop Coalition	Sorensen, Mike	No
Complete the Loop Coalition	Burgoon, Peter	Yes
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	No
Individual	Hays, Steve	No
Individual	King, John	Yes
Individual	Tracy, Patrick	Yes
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kearns & West	Day, Mary Beth	Yes
Kleinschmidt Associates	Denis, Nathalie	No
Kleinschmidt Associates	Harper, Matthew	No
Kleinschmidt Associates	Oswald, Fatima	No
Kleinschmidt Associates	Waters, Emily	No
Kleinschmidt Associates	Whelpley, Angela	No
SWCA Environmental Consultants	Holmes, Nuria	No
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Harris, Chelsea	No
Washington State Parks	Patnode, Brian	No
Washington State Parks	Foster, Colleen	Yes
Wenatchee Row and Paddle Club	Thorson, Eric	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate final June 16th Recreation & Land Use TWG meeting summary.	6/23/2022
Chelan PUD	Share any information regarding an investment schedule for Rock Island Recreation Plan.	7/21/2022

KEY DISCUSSION POINTS

DECISIONS MADE
During the Thursday, June 16th Recreation & Land Use TWG, the TWG reviewed and discussed the Walla Walla Point Park and Wenatchee Confluence State Park Recreation Plan as-builts.
TWG members walked through Walla Walla Point Park and Wenatchee Confluence State Park South, also known as Horan Natural Area, and discussed recreation use and amenities in these sites. Uses included birdwatching/nature viewing, cycling, sports fields/courts, interpretive signage, benches, and trails.
At the next Recreation & Land Use TWG, which will be held Thursday, July 21st from 8:15 a.m. – 12 p.m., Kleinschmidt will present the Draft Recreation Inventory Study Plan and be available to answer questions. Also continue as necessary the discussion of the recreation comments list.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
None

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-06-16 Recreation TWG Agenda
Minutes	Map	Relicensing Posterboard Map
Minutes	Map	RI Recreation Plan Sites and Apple Capital Loop Trail
Minutes	Map	RI Recreation Plan As-Builts (Walla Walla Point Park & Wenatchee Confluence State Park)

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: July 12, 2022
TIME: 8:30 a.m. – 3:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Provide an update on the draft 2022 White Sturgeon Population Index Study Plan and the draft 2022 Water Quality Monitoring Study Plan.
- Evaluate comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for Pacific Lamprey, Resident Fish, Benthic, Aquatic Invasive Fish, and Aquatic Macrophytes topics.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	No
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Odell, Brian	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes

Agency/Organization	Participant	Attendance
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	No
Chelan County Public Utility District No. 1	Keller, Lance	No
Chelan County Public Utility District No. 1	Willard, Catherine	No
City of Rock Island	Laughlin, Brock	No
Columbia River Inter-Tribal Commission	Parker, Blaine	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	Yes
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Columbia River Inter-Tribal Commission	Skiles, Tom	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	Yes
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confluence Environmental Company	Doyle, Eric	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Nagel, Leah	No
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kearns & West	Day, Mary Beth	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes

Agency/Organization	Participant	Attendance
Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Steimle, Kai	No
Kleinschmidt Associates	Waters, Emily	No
National Oceanic & Atmospheric Administration	Carlon, Scott	Yes
National Oceanic & Atmospheric Administration	Yeager, Justin	No
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	No
State Attorney General Office	Kirigin, Lauren	No
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	Yes
US Bureau of Reclamation	Hoff, Gina	Yes
US Bureau of Reclamation	Archuleta, Shannon	No
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Neibauer, Judy	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Fish and Wildlife	Burgess, Dave	Yes
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Murdoch, Andrew	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review updated Comment Matrix, look into more information, review draft issue statements, and start to think more about the technical conversation/FERC Study Criteria.	Ongoing
Chelan PUD	Circulate final meeting summary from July 12 TWG meeting.	7/18/22
Chelan PUD	Consider TWG input and continue to update Comment Matrix.	Ongoing
Chelan PUD	Clarify what is meant by "timing" as a metric in assessing adult Pacific Lamprey upstream migration.	9/13/22

KEY DISCUSSION POINTS:

KEY DISCUSSION POINTS
During the Tuesday, July 12 Fish & Aquatic TWG, the TWG reviewed the Action Items list from the June Fish & Aquatic TWG meeting and received a brief update from Chelan PUD on related efforts.
The bulk of the July 12 meeting focused on the Comment Matrix where the TWG continued evaluating comments, reviewing potential issue statements, and having technical conversations related to the seven FERC Study Criteria for Pacific Lamprey, Resident Fish, Benthic, Aquatic Invasive Fish, and Aquatic Macrophytes topics.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-07-12 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-07-12 Fish & Aquatics TWG Facilitator Slides
Minutes	Comments	Stakeholder Comment Matrix - July 2022 - Aquatic Macrophytes.pdf
Minutes	Comments	Stakeholder Comment Matrix - July 2022 - Pacific Lamprey.pdf
Minutes	Comments	Stakeholder Comment Matrix - July 2022 - Benthic.pdf
Minutes	Comments	Stakeholder Comment Matrix - July 2022 - AIS fish.pdf
Minutes	Comments	Stakeholder Comment Matrix - July 2022 - Resident Fish.pdf

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: July 14, 2022
TIME: 9:00 a.m. – 10:00 a.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 595 229 347#

MEETING PURPOSE:

- Provide updates on the RTE Plants study, reviews, and summaries that will inform consideration of the remaining Wildlife & Botanical comments. Discuss with Technical Working Group members.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Audubon Society	McCammon, Bruce	No
Beck Botanical Services	Beck, Katy	No
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Cordell, Kelly	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
City of Rock Island	Laughlin, Brock	No
City of Wenatchee	Gloria, Laura	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	No
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Individual	Hays, Steve	No
Kearns & West	Day, Mary Beth	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Waters, Emily	No
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	No
US Bureau of Land Management	Clark, Linda	No
US Bureau of Land Management	Clark, Lisa	No
US Bureau of Land Management	Ellis, Erik	No
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington Native Plant Society	Ballinger, Susan	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

KEY DISCUSSION POINTS

KEY POINTS
At the July 14 Wildlife & Botanicals meeting, the Chelan PUD team provided updates on the review of available imagery to identify populations of Black Cottonwood; the RTE Plants study; the avian predation summary; the primary transmission line avian summary; water quality information (crosswalk with other TWGs); and the Rock Island pool fluctuation model.
TWG members noted that Wildlife & Botanical TWG meetings are useful to receive updates on studies as they are available, modifying the length of the meeting as is appropriate.
TWG members noted that it would be helpful to receive a link to the comment matrix.
TWG members expressed interest in learning about studies on plant species that are important to Tribes. The Chelan PUD team explained that these topics will be discussed during the Cultural TWG and that information can be shared with the Wildlife & Botanical TWG at that time. Formal Tribal consultation on this topic will begin following the submission of the PAD.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org) or Jim/Kearns & West (jdowning@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	8/11/2022
Chelan PUD / Kearns & West	Resend the link of the comment matrix to the TWG members.	8/11/2022
Chelan PUD	Circulate July 14 Wildlife & Botanical TWG meeting summary.	7/20/2022
Chelan PUD	Provide regular updates on the status of RTE Plants study, reviews, and consultations that will help to inform discussions of potential project effects and project nexus for W&B issues. These efforts include water quality	8/11/2022 and ongoing

	reviews/studies (crosswalking with other TWGs as necessary); the avian predation review; the primary transmission line avian summary; the Rock Island pool fluctuation model; the Black Cottonwood population identification process; and seeking USFWS input on issue statements concerning Ute ladies' tresses (comments WIL-02 WIL-08).	
Chelan PUD	When available, provide updates to/from the Cultural TWG on studies or evaluations of significant plant species to the Tribes.	Ongoing

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-07-14 Wildlife and Botanical TWG Agenda
Minutes	Presentation	2022-07-14 Wildlife & Botanical TWG Facilitator Slides
Matrix	Comments	2022-07-14 Wildlife & Botanical TWG Comment Matrix

ROCK ISLAND RELICENSING
2022 Q2 MANAGERS MEETING

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: July 19, 2022
TIME: 11:00 a.m. – 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting

MEETING PURPOSE:

- Provide an overview of the Rock Island Hydroelectric Project relicensing and Technical Working Group (TWG) process.
- Provide an update on the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use TWGs including membership, progress to date, and upcoming discussions.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	Johnston, Mark	No
Audubon Society	McCammon, Bruce	No
Beck Botanical Services	Beck, Katy	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	Yes
Bureau of Indian Affairs	Frozena, Jennifer	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Mercier, Bryan	No
Bureau of Indian Affairs	Peone, Rudy	No
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No

Chelan County Public Utility District No. 1	Baker, Ryan	Yes
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Cordell, Kelly	No
Chelan County Public Utility District No. 1	Erickson, Justin	Yes
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Odell, Brian	No
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Smith, Michelle	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
Chelan County Public Utility District No. 1	Willard, Catherine	No
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Columbia River Inter-Tribal Commission	Skiles, Tom	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Barney, Casey	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Lally, Jessica	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	No
Confederated Tribes and Bands of Yakama Nation	Oliver, Noah	No

Confederated Tribes and Bands of Yakama Nation	Rigdon, Phil	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes and Bands of Yakama Nation	Valdez, Kate	No
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Cook, Jacqueline	No
Confederated Tribes of the Colville Reservation	Davis, John	No
Confederated Tribes of the Colville Reservation	Desautel, Cody	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	No
Confederated Tribes of the Colville Reservation	Miller, Crystal	Yes
Confederated Tribes of the Colville Reservation	Moura, Guy	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Confluence Environmental Company	Doyle, Eric	No
Department of Archaeology and Historic Preservation	Borth, Holly	No
Department of Archaeology and Historic Preservation	Brooks, Allyson	No
Department of Archaeology and Historic Preservation	Houser, Michael	No
Department of Archaeology and Historic Preservation	Whitlam, Rob	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Murauskas, Joshua	No
Four Peaks Environmental	Nagel, Leah	No
Golder WSP	Grutter, Paul	Yes
Individual	Hays, Steve	No
Individual	King, John	Yes
Individual	Hunt, Rebecca	Yes
Kearns & West	Dahlin, Ariella	No
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Kennedy, Katy	Yes
Kearns & West	Rugani, Kelsey	Yes

Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Harper, Matthew	No
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
Kleinschmidt Associates	Waters, Emily	No
Kleinschmidt Associates	Whelpley, Angela	Yes
National Oceanic & Atmospheric Administration	Carlon, Scott	No
National Oceanic & Atmospheric Administration	Graves, Ritchie	Yes
National Oceanic & Atmospheric Administration	Yeager, Justin	No
National Park Service	Rosebrough, Susan	No
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	No
State Attorney General Office	Kirigin, Lauren	No
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
US Bureau of Land Management	Bailey, Richard	Yes
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Clark, Linda	No
US Bureau of Land Management	Clark, Lisa	No
US Bureau of Land Management	Ellis, Erik	No
US Bureau of Land Management	Pindel, Kurt	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	No
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Gale, William	No
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	McDowell, Tom	No
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Neibauer, Judy	No
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Riggs, Randi	No
US Fish and Wildlife Service	Thompson, Brad	No
Washington Native Plant Society	Ballinger, Susan	No
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Park, Sage	Yes
Washington State Department of Ecology	Peterschmidt, Mark	Yes

Washington State Department of Ecology	Roberts, Damon	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Ecology	Wolfman, Sonia	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Burgess, Dave	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Garrity, Michael	Yes
Washington State Department of Fish and Wildlife	Heironimus, Laura	No
Washington State Department of Fish and Wildlife	Hoenes, Brock	Yes
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Huinker, James	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Bell, Josh	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Washington State Parks	Herzog, Peter	Yes
Washington State Parks	Layton, Ryan	No
Washington State Parks	Patnode, Brian	No
Washington State Parks	Sternback, Mike	No
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate final meeting summary from July 19 TWG Manager's Meeting	7/26/22
Chelan PUD	Schedule the next quarterly TWG Manager's Meeting.	8/2/22

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, July 19 TWG Manager's Meeting, Chelan PUD provided an overview of the Rock Island Hydroelectric Project, the TWG process and progress of the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use TWGs.
The TWG Manager's group will meet on a quarterly basis. The next meeting will be scheduled likely in mid to late October.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-07-19 TWG Managers Group Agenda
Minutes	Presentation	2022-07-19 TWG Managers Group Presentation

ROCK ISLAND RELICENSING RECREATION & LAND USE MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: July 21, 2022
TIME: 9:00 – 11:30 a.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Evaluate comments for potential issue statement, considering project nexus and existing information, and formulate issue statement as appropriate for Recreation and Land Use topics, as time permits.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	McCammon, Bruce	Yes
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Taylor, Kate	No
Chelan County Public Utility District No. 1	Ulrich, Janel	No
Chelan County Public Utility District No. 1	Baker, Ryan	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No

City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Individual	Hays, Steve	No
Individual	King, John	Yes
Kearns & West	Hessenius, Angela	No
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Harper, Matthew	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Waters, Emily	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
SWCA Environmental Consultants	Holmes, Nuria	No
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Harris, Chelsea	No
Washington State Parks	Patnode, Brian	No
Washington State Parks	Foster, Colleen	Yes
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review Draft Recreation Inventory Study Plan	7/28/2022
TWG Members	Review updated Comment Matrix prior to the August 18th meeting to consider additional details and potential issue statements.	8/18/2022
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
Chelan PUD	Circulate final July 21st Recreation & Land Use TWG meeting summary.	7/28/2022
Chelan PUD	Update Comment Matrix to reflect the July 21st TWG meeting and circulate to TWG.	7/28/2022
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing
Kearns & West	Ensure comments to be addressed by the Wildlife & Botanical and Fish & Aquatic TWGs are transferred to the appropriate comment matrices.	8/18/2022

KEY DISCUSSION POINTS

DECISIONS MADE
During the Thursday, July 21, 2022 Recreation & Land Use TWG, the TWG reviewed the Action Items list from the May Recreation & Land Use TWG meeting and June site visit.
In addition, the TWG continued to review comments on Recreation and discussed proposed issue statements from Chelan PUD.
The following resources were shared during the meeting: • Draft Recreation Inventory Study Plan and comment form: https://chelanpud.commentinput.com/?id=NGhT6
At the next Recreation & Land Use TWG, which will be held Thursday, August 18th, the TWG will continue to discuss recreation comments and draft issue statements.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
A TWG member submitted a new comment regarding recreational boating and boating facility needs. The TWG will discuss this comment at a future meeting.
TWG members expressed concern that issue statements may not retain the specificity of some comments.
TWG members requested that recreation issue statements reflect the nexus of natural resource stewardship and recreation opportunities.
Chelan PUD will consider coordinating small group meetings in between TWG meetings for in-depth discussions of comments and issue statements.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-07-21 Recreation and Land Use TWG Agenda
Minutes	Presentation	2022-07-21 Recreation TWG Facilitator Slides
Minutes	Comments	2022 July Stakeholder Comment Matrix – Recreation & Land Use

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: August 9, 2022
TIME: 8:30 a.m. – 12:15 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Provide updates on Relicensing Studies.
- Evaluate comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for Bull Trout and White Sturgeon.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Blue Leaf	Wright, Corey	Yes
Blue Leaf	Robichaud, Dave	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	No
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Odell, Brian	Yes

Agency/Organization	Participant	Attendance
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
Chelan County Public Utility District No. 1	Willard, Catherine	No
City of Rock Island	Laughlin, Brock	No
Columbia River Inter-Tribal Commission	Parker, Blaine	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	Yes
Columbia River Inter-Tribal Commission	Skiles, Tom	Yes
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	Yes
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confluence Environmental Company	Doyle, Eric	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Four Peaks Environmental	Nagel, Leah	No
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kearns & West	Day, Mary Beth	No
Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kleinschmidt Associates	Keefe, MaryLouise	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
Kleinschmidt Associates	Steimle, Kai	No
Kleinschmidt Associates	Waters, Emily	No
Kleinschmidt Associates	Deason, Jeff	Yes
National Oceanic & Atmospheric Administration	Carlon, Scott	Yes
National Oceanic & Atmospheric Administration	Yeager, Justin	No
Northwest Power and Conservation Council	Horton, Stacy	Yes
Northwest Power and Conservation Council	Mounts, Sara	Yes
State Attorney General Office	Kirigin, Lauren	No
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	Yes
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Neibauer, Judy	No
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Ecology	Bugica, Kalman	Yes
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Jackson, Chad	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Burgess, Dave	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review updated Comment Matrix, look into more information, review draft issue statements, and start to think more about the technical conversation/FERC Study Criteria.	Ongoing
Chelan PUD	Circulate final meeting summary from August 9 TWG meeting.	8/15/22
Chelan PUD	Continue to keep the TWG apprised of updates related to the current studies (White Sturgeon Population Index Study, Water Quality Monitoring Study, Aquatic Macrophytes Study, and eDNA Study). • On the eDNA Study, Chelan to bring information on the number of samples per site and where sampling occurred.	Ongoing
USFWS and Chelan PUD	Convene offline conversation to develop list of questions/information needed related to Bull Trout critical habitat, and provide update to the TWG.	10/11/22

KEY DISCUSSION POINTS:

KEY DISCUSSION POINTS
During the Tuesday, August 9 Fish & Aquatic TWG, the TWG reviewed the Action Items list from the July Fish & Aquatic TWG meeting, received a brief update from Chelan PUD on related efforts, and discussed the status of current studies.
The bulk of the August 9 meeting focused on the Comment Matrix where the TWG continued evaluating comments, reviewing potential issues statements, and having technical conversations related to the seven FERC Study Criteria (e.g., project nexus, existing information, and study methodology) for Bull Trout and White Sturgeon.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-08-09 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-08-09 Fish & Aquatics TWG Facilitator Slides
Minutes	Presentation	2022-08-09 RI Bull Trout Summary
Minutes	Comments	2022 August - Stakeholder Comment Matrix - Bull Trout
Minutes	Comments	2022 August - Stakeholder Comment Matrix - White Sturgeon

ROCK ISLAND RELICENSING RECREATION & LAND USE MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: August 18, 2022
TIME: 9:00 – 11:00 a.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Evaluate comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for Recreation topics, as time permits.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	McCammon, Bruce	Yes
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Ulrich, Janel	No
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No

City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	No
Individual	Hays, Steve	No
Individual	King, John	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kearns & West	Day, Mary Beth	Yes
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Harper, Matthew	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	Yes
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Patnode, Brian	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review updated Comment Matrix prior to the September 15th meeting to consider additional details and potential issue statements.	9/15/2022
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
Yakama Nation	Review Wildlife & Botanical TWG Comment Matrix for comments related to native plants.	9/15/2022
Washington State Parks	Share information with Yakama Nation regarding tribal access to natural areas and plants.	9/15/2022
Washington State Parks	Provide update on usage of pump-out facilities at Wenatchee Confluence State Park.	9/15/2022
Washington State Parks	Discuss policy and signage for drone use within Wenatchee Confluence State Park with Chelan PUD park staff.	Ongoing
Chelan PUD	Circulate final August 18th Recreation & Land Use TWG meeting summary.	8/25/2022
Chelan PUD	Update Comment Matrix to reflect the August 18th TWG meeting and circulate to TWG.	8/25/2022
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing

KEY DISCUSSION POINTS

DECISIONS MADE

During the Thursday, August 18, 2022 Recreation & Land Use TWG, the TWG continued to review comments on Recreation and discussed proposed issue statements from Chelan PUD.

The TWG agreed that the following issue statements are complete:

- Whether designated natural areas in Chelan County PUDs Recreation Plan (i.e., Coyotes Dunes Natural Area and Horan Natural Area within Wenatchee Confluence State Park) are managed to preserve their function as natural areas.
- Whether education and interpretive opportunities at facilities designated in Chelan County PUD's Recreation Management Plan for the Rock Island Project meet current and expected future needs at those sites.
- Whether reservoir levels affect recreation use, experience, and access at facilities and amenities designated in Chelan County PUD's Recreation Plan for the Rock Island Project.

Chelan PUD confirmed the following topics will be addressed by recreation studies:

- Park user experience
- Apple Capital Loop Trail usage

The next Recreation & Land Use TWG will be held Thursday, September 15th. Future TWG meeting topics include reviewing the Recreation Inventory Study results as well as presenting the Recreation Use Study outline and plan.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
Washington State Parks may share information regarding their guidelines for access to natural areas at a future TWG meeting.
TWG members expressed interested in hearing updates on recreation related topics (e.g., cultural and historic interpretive signage) discussed by the Cultural & Historical Resources TWG.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-08-18 Recreation & Land Use TWG Agenda
Minutes	Presentation	2022-08-18 Recreation & Land Use TWG Facilitator Slides
Minutes	Comments	2022 August Stakeholder Comment Matrix – Recreation & Land Use

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: September 13, 2022
TIME: 8:30 a.m. – 12:00 p.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Share study and evaluation updates
- Build understanding on the early engagement process and path forward
- Provide clear next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	Yes
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Gillin, Cody	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	No
Chelan County Public Utility District No. 1	Odell, Brian	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	No
Chelan County Public Utility District No. 1	Towey, William	Yes

Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
Chelan County Public Utility District No. 1	Willard, Catherine	No
City of Rock Island	Laughlin, Brock	No
Columbia River Inter-Tribal Commission	Barton, Diane	Yes
Columbia River Inter-Tribal Commission	Carter, Julie	Yes
Columbia River Inter-Tribal Commission	Parker, Blaine	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Columbia River Inter-Tribal Commission	Skiles, Tom	Yes
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	Yes
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	Yes
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confluence Environmental Company	Doyle, Eric	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Four Peaks Environmental	Nagel, Leah	No
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Kearns & West	Dahlin, Ariella	No
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Kennedy, Katy	No
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Denis, Nathalie	No

Kleinschmidt Associates	Keefe, MaryLouise	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
National Oceanic & Atmospheric Administration	Carlon, Scott	Yes
National Oceanic & Atmospheric Administration	Yeager, Justin	No
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	Yes
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	Yes
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Kokos, Sonja	Yes
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Burgess, Dave	Yes
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Jackson, Chad	Yes
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from September 13 Fish & Aquatic TWG meeting	9/20/22
Kearns & West	Continue to check-in with TWG members	10/11/22
Kearns & West	Continue to think through and establish guidance for subteams	10/11/22
Kearns & West	Share copy of the Washington Department of Ecology 401	9/13/22

	presentation with Doug Marconi (also available on the Rock Island relicensing website here).	(complete)
TWG Members	Coordinate internally and identify subteam members, email contact information to RIRelicensing@chelanpud.org	9/23/22

KEY DISCUSSION POINTS:

DECISIONS MADE
During the Tuesday, September 13 Fish & Aquatic TWG, the TWG reviewed the Action Items list from the August Fish & Aquatic TWG meeting, received a brief update from Chelan PUD on related efforts, and discussed the status of current studies and evaluations.
The bulk of the September 13 meeting focused on a 6-month check-in in which the TWG reflected on progress and successes to date, reviewing the TWG objectives, and revisiting the early engagement schedule in more detail. The TWG also discussed the formation of subteams based on specific topic areas that will review, recommend, and report back to the TWG on study plans and reports.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
Kearns & West to maintain list of parking lot areas, including Bull Trout subadult movement and survival throughout the project, interactions and potential impacts to supplementation and conservations efforts related to Bull Trout and Resident fish, assessing Pacific Lamprey juvenile downstream passage.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-09-13 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-09-13 Fish & Aquatic TWG Facilitator Slides
Minutes	Comments	2022 September - Stakeholder Comment Matrix - Water Quality
Minutes	Comments	2022 September - Stakeholder Comment Matrix - Fish
Minutes	Comments	2022 September - Stakeholder Comment Matrix - Aquatic Macrophytes
Minutes	Comments	2022 September - Stakeholder Comment Matrix - Benthic

ROCK ISLAND RELICENSING RECREATION & LAND USE MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: September 15, 2022
TIME: 9:00 – 11:00 a.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Finish evaluating comments for potential issue statements, considering project nexus and existing information, and formulate issue statements as appropriate for Recreation topics, as time permits.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	McCammon, Bruce	Yes
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Taylor, Kate	No
Chelan County Public Utility District No. 1	Ulrich, Janel	No
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No

City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Individual	King, John	Yes
Individual	Hays, Steve	No
Kearns & West	Dahlin, Ariella	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Kennedy, Katy	Yes
Kearns & West	Downing, Jim	No
Kearns & West	Rugani, Kelsey	No
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	No
Kleinschmidt Associates	Harper, Matthew	No
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Harris, Chelsea	Yes
Washington State Parks	Foster, Colleen	No
Washington State Parks	Patnode, Brian	No
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review updated Comment Matrix prior to the October 20th meeting to consider additional details and potential issue statements.	10/20/2022
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
TWG Members	Review July Wildlife & Botanical TWG Comment Matrix for comments related to the Horan Natural Area.	10/20/2022
Washington State Parks	Confirm the Wildlife & Botanical TWG has a representative from Washington State Parks for vegetation management topics.	10/20/2022
Chelan PUD	Circulate final September 15th Recreation & Land Use TWG meeting summary.	9/22/2022
Chelan PUD	Update Comment Matrix to reflect the September 15th TWG meeting and circulate to TWG.	9/22/2022
Chelan PUD	Circulate previous report on Horan Natural Area vegetation to TWG.	9/22/2022
Chelan PUD	Discuss new issue statement proposed by TWG.	10/20/2022
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing

KEY DISCUSSION POINTS:

DECISIONS MADE
During the Thursday, September 15, 2022 Recreation & Land Use TWG, the TWG continued to review comments on Recreation and discussed proposed issue statements from Chelan PUD.
TWG Members proposed a new issue statement: • Whether the PUD Rec Plan's listed facilities and amenities are sufficient to recognize

and provide for the potential growth of recreation use within the Rock Island Pond area.
The TWG agreed that the following issue statement is complete: • Whether recreation use and capacity at facilities and amenities designated in Chelan County PUD's Recreation Plan for the Rock Island Project (i.e., Wenatchee Riverfront Park, Walla Walla Point Park, Kirby Billingsley Hydro Park, Wenatchee Confluence State Park, and Coyotes Dunes Natural Area) meet current and anticipated needs at those sites.
At the next Recreation & Land Use TWG meeting, which will be held Thursday, October 20th or Thursday, November 17th, the TWG will discuss the newly proposed issue statement and review the draft Recreation Use Study Outline.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
A TWG member expressed interest in accessing the results from the Recreation Inventory Study and recommended Birdability.org as a resource for improving accessibility of birding locations and amenities.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-09-15 Recreation & Land Use TWG Agenda
Minutes	Presentation	2022-09-15 Recreation & Land Use TWG Facilitator Slides
Minutes	Comments	2022 September Stakeholder Comment Matrix – Recreation and Land Use
Minutes	Reference Document	Rare Plant and Vegetation Survey of the Wenatchee Confluence State Park

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: October 11, 2022
TIME: 9:00 – 10:00 a.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Share study and evaluation updates
- Build understanding on the early engagement and Subteam process
- Provide clear next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	Yes
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Odell, Brian	No
Chelan County Public Utility District No. 1	Taylor, Kate	No
Chelan County Public Utility District No. 1	Willard, Catherine	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
City of Rock Island	Laughlin, Brock	No
Columbia River Inter-Tribal Commission	Barton, Diane	Yes
Columbia River Inter-Tribal Commission	Carter, Julie	Yes
Columbia River Inter-Tribal Commission	Parker, Blaine	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	Yes
Columbia River Inter-Tribal Commission	Skiles, Tom	Yes
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	Yes
Confluence Environmental Company	Doyle, Eric	No
Environmental Assessment Services	Lindsey, Cole	No
Four Peaks Environmental	Nagel, Leah	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	No
Kearns & West	Kennedy, Katy	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Deason, Jeff	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
National Oceanic & Atmospheric Administration	Yeager, Justin	No
National Oceanic & Atmospheric Administration	Carlon, Scott	Yes
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Department of Fish and Wildlife	Burgess, Dave	Yes
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Huinker, James	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from October 11 Fish & Aquatic TWG meeting	10/18/22
Chelan PUD	Share initial information on the eDNA study with Dianne Barton and Blaine Parker, CRITFC	10/18/22
Kearns & West	Continue to check-in with TWG members	Ongoing

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, October 11 Fish & Aquatic TWG, the TWG reviewed the Action Items list from the September Fish & Aquatic TWG meeting, received a brief update from Chelan PUD on related efforts, and discussed the status of current studies and evaluations.
The bulk of the October meeting focused on reviewing the early engagement schedule in more detail. The TWG also discussed the formation of subteams based on specific topic areas that will review, recommend, and report back to the TWG on study plans and reports.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
TWG members reinforced a few parking lot items including discussing Tumwater Dam, Chiwawa Weir, and Bull Trout subadult movement and survival throughout the project.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-10-11 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-10-11 Fish & Aquatics TWG Facilitator Slides

ROCK ISLAND RELICENSING
FISH AND AQUATICS
PACIFIC LAMPREY SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: October 11, 2022
TIME: 10:30 a.m. – 12:00 p.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 254 241 769#

MEETING PURPOSE:

- Review and discuss components of the draft 2023 Juvenile and Larval Pacific Lamprey Reservoir Habitat Study Plan/Concept
- Review and discuss components of the draft 2023 Pacific Lamprey Infrastructure Assessment Study Plan/Concept
- Provide clear next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Bureau of Indian Affairs	Lewis, Steve	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	Yes
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Four Peaks Environmental	Murauskas, Joshua	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kleinschmidt Associates	Thompson, Audrey	Yes
US Fish and Wildlife Service	Gale, William	No
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Nelle, R.D.	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from October 11 Fish & Aquatic TWG meeting	10/18/22
Chelan PUD	Develop a 2023 Juvenile and Larval Pacific Lamprey Habitat Study Plan and a 2023 Pacific Lamprey Infrastructure Assessment Plan. Schedule the next subteam meeting when the drafts are ready for discussion.	TBD

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
The Pacific Lamprey Subteam met to review and discuss the draft study concepts and approach for the 2023 Pacific Lamprey Juvenile and Larval Reservoir Habitat Study and 2023 Pacific Lamprey Infrastructure Assessment. Discussion focused on clarifying questions, considerations for the Project Team as they develop the Study and Assessment Plans, and sharing existing information.
Subteam members discussed the importance of using consistent terminology, validating desktop analysis with field sampling, building clarity into the study titles, and considering timing of dewatering and the potential effects of infrequent operations events.
Subteam members shared the following studies and reports: • Clemens, 2019: A Call for Standard Terminology for Lamprey Life Stages • Lamprey Technical Workgroup, 2020: Best management guidelines for native lampreys during in-water work • Lamprey Technical Workgroup, 2022: Practical guidelines for incorporating adult Pacific lamprey passage at fishways

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
Potential parking lot topics: • Sediment sampling and tissue sampling (crosswalk with the Water Quality subteam) • Predation • A pool fluctuation for adult Pacific Lamprey
There was a general interest in conducting other sampling efforts (sediments, presence of native mussels) while in the field for efficiency.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-10-11 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-10-11 Fish & Aquatics TWG Pacific Lamprey Subteam

ROCK ISLAND RELICENSING
FISH AND AQUATICS
BULL TROUT / RESIDENT FISH SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: October 11, 2022
TIME: 1:00 – 2:00 p.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 434 141 30#

MEETING PURPOSE:

- Review and discuss components of the draft 2023 Trapping and Stranding Study Plan/Concept
- Provide clear next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Department of Fish and Wildlife	Burgess, Dave	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	Yes
Kleinschmidt Associates	Thompson, Audrey	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kearns & West	Rugani, Kelsey	Yes
Kearns & West	Hessenius, Angela	Yes
Four Peaks Environmental	Miller, Joe	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes
Confederated Tribes and Bands of Yakama Nation	Byington, Russ	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Columbia River Inter-Tribal Commission	Parker, Blaine	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Bureau of Indian Affairs	Lewis, Steve	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from October 11 Fish & Aquatic TWG meeting	10/18/22
Chelan PUD	Develop a 2023 Trapping and Stranding Study Plan. Schedule the next subteam meeting when the drafts are ready for discussion.	TBD
Chelan PUD	Consider how to frame and communicate a phased approach for studies being pursued as areas of focus for early engagement.	11/08/22
Subteam members	Connect offline or via email to share any relevant studies or resources with Chelan PUD and/or Kearns & West to share with the study team to incorporate in the draft study plan.	11/08/22

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
The Resident Fish/Bull Trout Subteam met to review and discuss the draft study concepts and approach for the 2023 Trapping and Stranding Study. Discussion focused on clarifying questions, considerations for the Project Team as they develop the Study Plan, and sharing existing information.
Subteam members discussed the importance of field validation of desktop analyses, clarified the species and life stages that would be included in the study as well as language in the draft study objectives (add “duration,” “dewatering” vs. “stranding”), and noted that many bull trout stranding studies have been conducted. The team also discussed that this study can be a first step in a phased approach and that the data and information generated from this study assessing habitat can be taken in a lot of different directions.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
Potential parking lot topics: • Addressing populations of non-native resident species (urgency of gathering baseline data should be prioritized) • Other bull trout data gaps such as habitat use (forage areas, cover) and predation can be overlaid with desktop data

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-10-11 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-10-11 Fish & Aquatics TWG Bull Trout-Resident Fish Subteam

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: October 13, 2022
TIME: 9:00 a.m. – 10:00 a.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 595 229 347#

MEETING PURPOSE:

- Provide an update on studies, reviews, and summaries that will inform consideration of the remaining comments in the Wildlife & Botanical issues list. Discuss with Technical Working Group members.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No
Washington State Dept of Natural Resources	Huinker, James	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington Native Plant Society	Ballinger, Susan	No
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Riggs, Randi	No
US Fish and Wildlife Service	Orling, Emily	Yes
US Bureau of Land Management	Clark, Linda	No
US Bureau of Land Management	Clark, Lisa	No
US Bureau of Land Management	Ellis, Erik	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	Yes
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kearns & West	Day, Mary Beth	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kearns & West	Downing, Jim	Yes
Kearns & West	Kennedy, Katy	Yes
Individual	Hays, Steve	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	No
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
City of Wenatchee	Gloria, Laura	No
City of Rock Island	Laughlin, Brock	No
Chelan County Public Utility District No. 1	Taylor, Kate	No
Chelan County Public Utility District No. 1	Cordell, Kelly	Yes
Chelan County Public Utility District No. 1	Gillin, Cody	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Beck Botanical Services	Beck, Katy	No
Audubon Society	Johnston, Mark	Yes
Audubon Society	McCammon, Bruce	No
American Rivers	Moran, Bridget	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
[no new parking lot items]

KEY POINTS

KEY POINTS
The TWG reviewed the Action Items list from the July Wildlife & Botanical TWG meeting, reviewed TWG process and progress to date, and discussed the status of current studies and evaluations.
The technical team provided updates on the status of current studies and evaluations, including the Rock Island pool fluctuation modeling, the imagery review to identify populations of Black Cottonwood, the piscivorous bird summary, the primary transmission line avian summary, water quality study progress, and the RTE Plants Study.
The technical team shared that four Washington State Listed plant species were identified through the RTE Plants Study, including the fuzzytongue penstemon (*Penstemon eriantherus var. whitedii)*; greater Canadian St. John's wort (*Hypericum majus)*; Suksdorf's monkeyflower (*Mimulus suksdorfii)*; and the Little bluestem (*Schizachyrium scorparium var. scoparium)*. One federally listed ESA species was identified: Ute ladies'-tresses (*Spiranthes diluvialis),* a Threatened species. Consistent with management of listed plant species data connected with the Rocky Reach Hydroelectric Project, detailed results of the RTE Plants Study will be confidential to avoid disclosure of locations of state or federally listed plant species. The technical team proposed the convening of an RTE Plants subteam to further discuss the study results and next steps. TWG members agreed with the proposed approach.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from October 13 Wildlife & Botanical TWG meeting	10/20/2022
Chelan PUD	Provide regular updates on studies, summaries, and evaluations that will help to inform discussions of potential project effects and project nexus for W&B issues. These efforts include water quality reviews/studies (crosswalking with others TWGs as necessary); the piscivorous bird summary; the primary transmission line avian summary; the Rock Island pool fluctuation model; and the Black Cottonwood population identification process.	Ongoing
TWG Members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org) or Jim/Kearns & West (jdowning@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-10-13 Wildlife and Botanical TWG Agenda
Minutes	Presentation	2022-10-13 Wildlife & Botanical TWG Facilitator Slides

ROCK ISLAND RELICENSING
2022 Q3-Q4 MANAGERS MEETING

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: November 1, 2022
TIME: 11:00 a.m. – 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 323-457-6502 Enter Meeting ID: 235 188 901 717

MEETING PURPOSE:

- Provide an overview of the Rock Island Hydroelectric Project relicensing and Technical Working Group (TWG) process.
- Provide an update on the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use TWGs including membership, progress to date, and upcoming discussions.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	Johnston, Mark	No
Audubon Society	McCammon, Bruce	No
Beck Botanical Services	Beck, Katy	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Mercier, Bryan	No
Bureau of Indian Affairs	Peone, Rudy	No
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Cordell, Kelly	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Odell, Brian	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
Chelan County Public Utility District No. 1	Willard, Catherine	No
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Columbia River Inter-Tribal Commission	Skiles, Tom	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Barney, Casey	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Lally, Jessica	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	No
Confederated Tribes and Bands of Yakama Nation	Oliver, Noah	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes and Bands of Yakama Nation	Rigdon, Phil	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes and Bands of Yakama Nation	Valdez, Kate	No
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Cook, Jacqueline	No
Confederated Tribes of the Colville Reservation	Davis, John	No
Confederated Tribes of the Colville Reservation	Desautel, Cody	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	No
Confederated Tribes of the Colville Reservation	Miller, Crystal	No
Confederated Tribes of the Colville Reservation	Moura, Guy	Yes
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	Yes
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Confluence Environmental Company	Doyle, Eric	No
Department of Archaeology and Historic Preservation	Borth, Holly	No
Department of Archaeology and Historic Preservation	Brooks, Allyson	No
Department of Archaeology and Historic Preservation	Houser, Michael	No
Department of Archaeology and Historic Preservation	Whitlam, Rob	Yes
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Environmental Assessment Services	Lindsey, Cole	No
Four Peaks Environmental	Miller, Joe	No
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Four Peaks Environmental	Nagel, Leah	No
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Individual	King, John	Yes
Kearns & West	Dahlin, Ariella	No
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	No
Kearns & West	Hessenius, Angela	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kearns & West	Kennedy, Katy	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Steimle, Kai	No
Kleinschmidt Associates	Thompson, Audrey	No
Kleinschmidt Associates	Whelpley, Angela	No
National Oceanic & Atmospheric Administration	Carlon, Scott	Yes
National Oceanic & Atmospheric Administration	Graves, Ritchie	Yes
National Oceanic & Atmospheric Administration	Yeager, Justin	Yes
National Park Service	Bowes, Stephen	Yes
National Park Service	Rosebrough, Susan	No
Northwest Power and Conservation Council	Horton, Stacy	Yes
Northwest Power and Conservation Council	Mounts, Sara	No
State Attorney General Office	Kirigin, Lauren	No
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
US Bureau of Land Management	Bailey, Richard	Yes
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Clark, Lisa	No
US Bureau of Land Management	Ellis, Erik	No
US Bureau of Land Management	Pindel, Kurt	No
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	No
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	Yes
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Kokos, Sonja	Yes
US Fish and Wildlife Service	McDowell, Tom	No
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Orling, Emily	No
US Fish and Wildlife Service	Riggs, Randi	No
US Fish and Wildlife Service	Romine, Jason	No
US Fish and Wildlife Service	Thompson, Brad	No
Washington Native Plant Society	Ballinger, Susan	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Park, Sage	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
Washington State Department of Ecology	Roberts, Damon	No
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	Yes
Washington State Department of Fish and Wildlife	Burgess, Dave	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Garrity, Michael	Yes
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Hoenes, Brock	No
Washington State Department of Fish and Wildlife	Jackson, Chad	Yes
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Washington State Parks	Herzog, Peter	No
Washington State Parks	Layton, Ryan	No
Washington State Parks	Patnode, Brian	No
Washington State Parks	Sternback, Mike	No
Wenatchee Row and Paddle Club	Thorson, Eric	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWGs/Chelan PUD	Continue to build understanding around the Comment Matrix and the Early Engagement schedule in TWG meetings and offline discussions.	Ongoing
Chelan PUD	Circulate final meeting summary from November 1 TWG Manager's Meeting.	11/8/22

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Schedule the next quarterly TWG Manager's Meeting.	2023 Q2

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, November 1 TWG Manager's Meeting, Chelan PUD provided an overview of the Rock Island Hydroelectric Project and Early Engagement process as well as progress of the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use TWGs, including updates on ongoing studies and evaluations.
The TWG Manager's group will meet on a quarterly basis. The next meeting will be scheduled likely in mid to late April.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-11-01 TWG Managers Group Agenda
Minutes	Presentation	2022-11-01 TWG Managers Group Presentation

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: November 8, 2022
TIME: 9:00 – 11:00 a.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Provide updates on the Fish & Aquatic TWG Studies and build understanding of schedule
- Check-in on early engagement process
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	Yes
Bureau of Indian Affairs (BIA)	Hatch, Keith	No
BIA	Lewis, Steve	Yes
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1 (Chelan PUD)	Odell, Brian	No
Chelan PUD	Taylor, Kate	No
Chelan PUD	Underwood, Alene	No
Chelan PUD	Willard, Catherine	No
Chelan PUD	Clement, Marcie	Yes
Chelan PUD	Hopkins, Scott	Yes
Chelan PUD	Keller, Lance	Yes
Chelan PUD	Towey, William	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan PUD	Truscott, Ben	Yes
Chelan PUD	Ulrich, Janel	Yes
City of Rock Island	Laughlin, Brock	No
Columbia River Inter-Tribal Commission (CRITFC)	Barton, Diane	No
CRITFC	Carter, Julie	No
CRITFC	Parker, Blaine	No
CRITFC	Porter, Lauri	No
CRITFC	Skiles, Tom	Yes
Confederated Tribes and Bands of Yakama Nation (Yakama Nation)	Blodgett, David	No
Yakama Nation	Harvey, Elaine	No
Yakama Nation	Iverson, Tom	No
Yakama Nation	Lampman, Ralph	No
Yakama Nation	Miller, Donella	No
Yakama Nation	Rogers, Brandon	No
Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Colville Reservation (Colville Tribes)	Baldwin, Casey	No
Colville Tribes	Marconi, Douglas	No
Colville Tribes	McLellan, Jason	No
Colville Tribes	Nine, Bret	No
Colville Tribes	Truscott, Kirk	Yes
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	No
Confluence Environmental Company	Doyle, Eric	No
Environmental Assessment Services	Lindsey, Cole	No
Four Peaks Environmental (Four Peaks)	Nagel, Leah	No
Four Peaks	Miller, Joe	Yes
Four Peaks	Mugunthan, Pradeep	Yes
Four Peaks	Murauskas, Joshua	Yes
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	No
Kearns & West	Kennedy, Katy	No
Kearns & West	Hessenius, Angela	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates (Kleinschmidt)	Keefe, MaryLouise	No
Kleinschmidt	Deason, Jeff	Yes
Kleinschmidt	Denis, Nathalie	Yes
Kleinschmidt	Steimle, Kai	Yes
Kleinschmidt	Thompson, Audrey	Yes
National Oceanic & Atmospheric Administration (NOAA)	Yeager, Justin	No
NOAA	Carlon, Scott	Yes
Northwest Power and Conservation Council (NWPCC)	Horton, Stacy	Yes
NWPCC	Mounts, Sara	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
US Bureau of Reclamation (USBR)	Archuleta, Shannon	No
USBR	Hoff, Gina	Yes
US Fish and Wildlife Service (USFWS)	Romine, Jason	No
USFWS	Kokos, Sonja	No
USFWS	Muir, Kenneth	No
USFWS	Neibauer, Judy	No
USFWS	Nelle, R.D.	No
USFWS	Gale, William	Yes
USFWS	Treadwell, Jerrmaine	Yes
USFWS	Humling, Michael	Yes
Washington State Department of Ecology (Ecology)	Oreiro, Tyson	No
Ecology	Peterschmidt, Mark	Yes
Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife (WDFW)	Blank, Benjamin	No
WDFW	Heironimus, Laura	No
WDFW	Jackson, Chad	No
WDFW	Murdoch, Andrew	No
WDFW	Burgess, Dave	Yes
WDFW	Verhey, Patrick	Yes
Washington State Dept of Natural Resources (WADNR)	Preston, Cindy	No
WADNR	Huinker, James	Yes
Washington State Parks (Parks)	Fielding, Andrew	No
Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate final meeting summary from November 8 TWG meeting.	11/15/22
Chelan PUD	Upload updated Comment Matrices to the Rock Island Relicensing website.	11/15/22
Chelan PUD	Circulate Lamprey Technical Work Group Fish Passage document outlining more detail on how to conduct an infrastructure assessment so TWG members get a good idea of what will be included in the Pacific Lamprey Adult Infrastructure Assessment Plan.	Prior to 12/13/22
Chelan PUD	Consider TWG input on the Fish & Aquatic Study schedules, particularly on giving Subteams more time to review draft documents before Subteam meetings. Discuss with subteams whether it is possible to convene on a different day to allow more review time.	Prior to 12/13/22
Chelan PUD	Verify that Gina Hoff (US Bureau of Reclamation) is part of the Aquatic Macrophytes Subteam.	Prior to 12/13/22
Chelan PUD/Kearns & West	Consider TWG input on the Fish & Aquatic TWG Comment Matrices and Parking Lot, particularly on what the process could be for discussing or advancing comments during the rest of Early Engagement.	Prior to 12/13/22
Kearns & West	Continue checking in with TWG members.	Ongoing

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, November 8 Fish & Aquatic TWG, the TWG reviewed the Action Items list from the October Fish & Aquatic TWG meeting, received a brief update from Chelan PUD on related efforts, and discussed the status of current studies and evaluations, including the eDNA Study, Pool Flux evaluation, and Project Lands evaluation.

KEY DISCUSSION ITEMS
Chelan PUD also shared that they are working on three conceptual recreational amendments to the current Rock Island License. These amendments include Wenatchee Riverfront enhancements, Malaga Waterfront Park, and Confluence Parkway. Confluence Parkway is not expected until later in 2023. The other two will go out for consultation with the appropriate Rocky Reach forums this fall. Work will not begin on these projects until permits have been obtained.
The bulk of the November meeting focused on reviewing the early engagement schedule in more detail, including next steps for the 2022-2023 studies. For the Adult Pacific Lamprey Infrastructure Assessment, Larval and Juvenile Pacific Lamprey Habitat Study, Bull Trout/Resident Fish Stranding and Trapping Study, Aquatic Macrophytes Study, and White Sturgeon Population Study, the TWG reviewed an anticipated timeline for the next two quarters, including opportunities for subteams and the full TWG to review draft study outlines, plans, and/or reports as they are developed by Chelan PUD and study consultants. The TWG discussed the anticipated review periods and asked about how, who, and when the studies will be conducted. The TWG also checked in and shared input on the Parking Lot and Comment Matrices, particularly on how these will be used and maintained during early engagement. This discussion included a recap of the goals of early engagement and the process for developing comments into issue statements and studies, noting that not all issue statements will result in studies and that some studies may address multiple issue statements or specific components of issue statements. The TWG also reviewed the issue statements that have been developed to date and provided clarity on the "Parking Lot," which is a space to capture comments and topics that are important to stakeholders and are not currently being advanced in Early Engagement. The Parking Lot is retained in Comment Matrix documents (Aquatic Macrophytes, Aquatic Invasive Species, Benthic, Fish, and Water Quality) that are available on the Rock Island Relicensing website. The TWG shared questions on what topics are in the Parking Lot, why they are in the Parking Lot, and how they could be advanced either in Early Engagement or formal relicensing.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-11-08 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-11-08 Fish & Aquatics TWG Facilitator Slides
Minutes	Comments	2022 November - Stakeholder Comment Matrix - Aquatic Macrophytes
Minutes	Comments	2022 November - Stakeholder Comment Matrix - Benthic
Minutes	Comments	2022 November - Stakeholder Comment Matrix - AIS
Minutes	Comments	2022 November - Stakeholder Comment Matrix - Water Quality
Minutes	Comments	2022 November - Stakeholder Comment Matrix - Fish

ROCK ISLAND RELICENSING RECREATION & LAND USE MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: November 17, 2022
TIME: 9:00 – 11:00 a.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Share study and evaluation updates.
- Build understanding on the early engagement process and path forward.
- Confirm next steps and action items.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Wenatchee Row and Paddle Club	Thorson, Eric	Yes
Washington State Parks	Patnode, Brian	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Ecology	Peterschmidt, Mark	Yes
US Fish and Wildlife Service	Riggs, Randi	No
US Bureau of Reclamation	Hoff, Gina	No
US Bureau of Land Management	Bryan, Curtis	No
US Bureau of Land Management	Priebe, Diane	No

US Bureau of Land Management	Russell, Katherine	No
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
Kearns & West	Downing, Jim	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Kennedy, Katy	Yes
Individual	Hays, Steve	No
Individual	King, John	Yes
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
City of Wenatchee	Gloria, Laura	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Rock Island	Duffy, Charity	Yes
City of East Wenatchee	Lillquist, Curtis	No
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Graves, Lisa	Yes
Chelan County Public Utility District No. 1	Gillin, Cody	Yes
Chelan County Public Utility District No. 1	Osborn, Jeff	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Audubon Society	McCammon, Bruce	Yes
American Whitewater	O'Keefe, Thomas	No
American Rivers	Moran, Bridget	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Review updated Comment Matrix prior to the January 19th meeting and share any questions about the parking lot with Chelan PUD or Kearns & West.	1/19/2023
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
Chelan PUD	Circulate final November 17th Recreation & Land Use TWG meeting summary.	11/24/2022
Chelan PUD	Update Comment Matrix to reflect the November 17th TWG meeting and circulate to TWG.	11/24/2022
Chelan PUD	Share topo-bathymetric data with Bruce McCammon.	1/19/2023
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing

KEY DISCUSSION POINTS:

DECISIONS MADE
During the Thursday, November 17, 2022 Recreation & Land Use TWG, the TWG received an update from Chelan PUD on studies, evaluations, and related efforts as well as an overview of the upcoming Recreation Use Study.
The TWG also had a process check-in to review TWG and early engagement objectives and schedule, progress to date, and next steps. In 2023, the TWG will be primarily focused on reviewing and discussing draft study plans and study reports.
At the next Recreation & Land Use TWG meeting, which will be held Thursday, January 19th, the TWG will discuss the Recreation Inventory Report.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
Comments related to recreational use of Rock Island Ponds and a suggestion to develop a long-term management plan for the Horan Natural Area were moved to the Parking Lot.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-11-17 Recreation & Land Use TWG Agenda
Minutes	Presentation	2022-11-17 Recreation & Land Use TWG Facilitator Slides
Minutes	Comments	2022_November_Stakeholder_Comment_Matrix_–_Recreation and Land Use

ROCK ISLAND RELICENSING
FISH AND AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: December 13, 2022
TIME: 9:00 a.m. – 10:30 a.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Provide updates on related Chelan PUD efforts and current Fish & Aquatic TWG Studies
- Check-in on early engagement process
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No
Washington State Dept of Natural Resources	Huinker, James	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Burgess, Dave	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	No
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Ecology	Glisson, Wes	No
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
US Fish and Wildlife Service	Kokos, Sonja	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Romine, Jason	Yes
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	Yes
National Oceanic & Atmospheric Administration	Carlon, Scott	No
National Oceanic & Atmospheric Administration	Yeager, Justin	No
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Steimle, Kai	No
Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	No
Kearns & West	Kennedy, Katy	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Individual	Hays, Steve	No
Golder WSP	Grutter, Paul	No
Four Peaks Environmental	Mugunthan, Pradeep	No
Four Peaks Environmental	Nagel, Leah	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Environmental Assessment Services	Lindsey, Cole	No
Environmental Assessment Services	Elias, Becky	Yes
Environmental Assessment Services	Paulsen, Matt	Yes
Confluence Environmental Company	Doyle, Eric	No
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	No
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Columbia River Inter-Tribal Commission	Skiles, Tom	Yes
City of Rock Island	Laughlin, Brock	No
Chelan County Public Utility District No. 1	Willard, Catherine	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Odell, Brian	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Cascade Fisheries	Lundgren, Jason	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	Yes
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Audubon Society	Johnston, Mark	No
American Rivers	Moran, Bridget	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from December 13th Fish & Aquatic TWG meeting.	12/20/22
Chelan PUD	Share what is required in a Pre-Application Document (PAD) and the Table of Contents.	1/10/23
Chelan PUD	Review and update status notes in the comment matrices to share rationale for parking lot status.	2/14/23
TWG Members	Review Issue Statements List and updated Comment Matrices.	2/14/23
Chelan PUD	Develop 2023 TWG and subteam meetings schedule.	2/14/23
TWG Members	Provide relevant studies or reports to Chelan PUD/Kearns & West.	Ongoing

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, December 13 Fish & Aquatic TWG meeting, the TWG members reviewed the Action Items list from the November Fish & Aquatic TWG meeting, received a brief update from Chelan PUD on related efforts, and discussed the status of the 2022-2023 studies.
The bulk of the December meeting focused on the 2022-2023 study schedules. The TWG also checked in on the early engagement process including introducing the Issue Statements List and building understanding of the parking lot.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-12-13 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-12-13 Fish & Aquatics TWG Facilitator Slides

ROCK ISLAND RELICENSING
FISH AND AQUATICS
MACROPHYTES SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: December 13, 2022
TIME: 11:00 a.m. – 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE

- Introduce the Macrophytes Study concepts
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Ecology	Glisson, Wes	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
US Bureau of Reclamation	Hoff, Gina	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Environmental Assessment Services	Lindsey, Cole	No
Environmental Assessment Services	Elias, Becky	Yes
Environmental Assessment Services	Paulsen, Matt	Yes
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Columbia River Inter-Tribal Commission	Skiles, Tom	Yes
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Bureau of Indian Affairs	Lewis, Steve	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from December 13 Macrophytes Subteam meeting.	12/20/22
Chelan PUD	Develop the 2023 Macrophytes Study Plan. Schedule the next subteam meeting when the drafts are ready for discussion.	3/14/23

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
The Macrophytes Subteam met to review and discuss the draft study concepts and approach for the 2023 Macrophytes Monitoring Study. Discussion focused on clarifying questions and considerations for the Project Team as they develop the Study Plan.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-12-13 Fish and Aquatic TWG Agenda
Minutes	Presentation	2022-12-13 Fish & Aquatics Macrophytes Subteam Facilitator Slides

ROCK ISLAND RELICENSING
FISH AND AQUATICS
PACIFIC LAMPREY SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: December 19, 2022
TIME: 11:00 a.m. - 12:00 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 247 749 018#

MEETING PURPOSE:

- Review and discuss the draft 2023 Pacific Lamprey Fishway Infrastructure Assessment Plan
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
US Fish and Wildlife Service	Neibauer, Judy	No
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Nelle, R.D.	No
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Bureau of Indian Affairs	Lewis, Steve	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from December 19 Pacific Lamprey Subteam meeting.	12/23/22
Chelan PUD	Incorporate comments received from subteam members and send the final Draft 2023 Adult Pacific Lamprey Fishway Infrastructure Assessment Plan for a 10-business day review period via SmartComment.	12/29/22

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
The Pacific Lamprey Subteam met to review and discuss the draft study plan for the 2023 Adult Pacific Lamprey Fishway Infrastructure Assessment. Discussion focused on clarifying questions and suggested edits to the draft assessment plan, including opportunities to increase specificity. Subteam members also shared the importance of good photo documentation of the infrastructure being assessed.
Subteam members expressed interest in partaking in the on-site inspection, however, due to safety protocols requiring specific training requirements for entrance and rescue, the on-site inspection will be conducted by CPUD and contracted staff only.
Subteam members also discussed potential areas for future study, including analyzing existing PIT tag data, evaluating the accuracy of ladder counts collected at the project, and investigating whether certain fish ladders are preferred by lamprey and if this varies seasonally.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2022-12-19 Pacific Lamprey Subteam Agenda
Minutes	Presentation	2022-12-19 Pacific Lamprey Subteam Facilitator Slides

ROCK ISLAND RELICENSING
FISH & AQUATIC TWG

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: January 10, 2023
TIME: 9:00 a.m. – 10:30 a.m. Pacific Standard Time (PST)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Provide updates on related Chelan PUD efforts and current Fish & Aquatic TWG Studies
- Share FERC relicensing references
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Dept of Natural Resources	Preston, Cindy	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Burgess, Dave	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Jackson, Chad	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
US Fish and Wildlife Service	Callaway, Tara	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Muir, Kenneth	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Romine, Jason	Yes
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	No
National Oceanic & Atmospheric Administration	Yeager, Justin	No
National Oceanic & Atmospheric Administration	Carlon, Scott	Yes
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	No
Kearns & West	Kennedy, Katy	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Individual	Hays, Steve	No
Golder WSP	Grutter, Paul	No
Four Peaks Environmental	Mugunthan, Pradeep	No
Four Peaks Environmental	Nagel, Leah	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Environmental Assessment Services	Lindsey, Cole	No
Environmental Assessment Services	Paulsen, Matt	Yes
Confluence Environmental Company	Doyle, Eric	No
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	No
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Columbia River Inter-Tribal Commission	Skiles, Tom	No
City of Rock Island	Laughlin, Brock	No
Chelan County Public Utility District No. 1	Ulrich, Janel	No
Chelan County Public Utility District No. 1	Willard, Catherine	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Odell, Brian	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Underwood, Alene	Yes
Chelan County	Sanderson, Julie	No
Cascade Fisheries	Lundgren, Jason	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Audubon Society	Johnston, Mark	No
American Rivers	Moran, Bridget	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from January 10th Fish & Aquatic TWG meeting.	1/17/23
Chelan PUD	Share preliminary draft Table of Contents for Rock Island Pre-Application Document (PAD)	1/17/23
Chelan PUD	Share FERC Relicensing reference materials and requirements with TWG members: • Hydropower Licensing - Get Involved • A Guide to Understanding and Applying the Study Criteria (ferc.gov) • Pre-Application Document (PAD) Adequacy Review Checklist pursuant to 18 CFR 5.6 (ferc.gov) • FERC ILP Flowchart (Pre-Application Activity) • eLibrary | General search (ferc.gov)	1/17/23
Chelan PUD	Share a copy of Rock Island Habitat Conservation Plan (HCP) with TWG members: • Available on Chelan PUD website here: Habitat Conservation Plans (chelanpud.org) Direct link to HCP: RI HCP (chelanpud.org)	1/17/23
Chelan PUD	Review and update status notes in the comment matrices to share rationale for parking lot status.	2/14/23
TWG Members	Review Issue Statements List and updated Comment Matrices.	2/14/23
Chelan PUD	Maintain 2023 TWG and subteam meetings schedule.	Ongoing
TWG Members	Provide relevant studies or reports to Chelan PUD/Kearns & West.	Ongoing

KEY DISCUSSION POINTS:

KEY POINTS
During the Tuesday, January 10 Fish & Aquatic TWG meeting, the TWG members reviewed the Action Items list from the December Fish & Aquatic TWG meeting, received a brief update from Chelan PUD on related efforts, and reviewed the current 2023 TWG subteams schedule.
During the Tuesday, January 10 Fish & Aquatic TWG meeting, Jeff Deason from Kleinschmidt Associates, shared links to various FERC relicensing reference materials and requirements and reviewed a preliminary draft Table of Contents for the Rock Island Hydroelectric Project's Pre-Application Document (PAD). TWG members asked questions to build understanding around components of the PAD and the 120-day comment period.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-01-10 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-01-10 Fish & Aquatics TWG Facilitator Slides
Minutes	Reference	PAD Table of Contents 2022-01-12

ROCK ISLAND RELICENSING
FISH & AQUATIC TWG
BULL TROUT / RESIDENT FISH SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: February 14, 2023
TIME: 10:00 a.m. – 11:30 a.m. Pacific Standard Time (PST)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Review and discuss the draft 2023 Stranding and Trapping Study Plan
- If time allows, walk-through Bull Trout/Resident Fish Issues List
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Fish and Wildlife	Burgess, Dave	Yes
Washington State Department of Fish and Wildlife	Jackson, Chad	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
US Fish and Wildlife Service	Gale, William	No
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Romine, Jason	Yes
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Four Peaks Environmental	Caldwell, Lucius	Yes
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes and Bands of Yakama Nation	Byington, Russ	Yes
Confederated Tribes and Bands of Yakama Nation	Newsome, Todd	Yes
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Bureau of Indian Affairs	Lewis, Steve	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from February 14th Bull Trout/Resident Fish Subteam Meeting.	2/21/23
Chelan PUD	Circulate Issue Statements List.	2/21/23
Chelan PUD	Incorporate comments received from Subteam members and send the final Draft 2023 Stranding and Trapping Study Plan for a 10-business day review period via SmartComment.	3/1/23
Bull Trout/Resident Fish Subteam	Review and discuss Resident Fish issue statements during a future Subteam meeting.	8/8/23

KEY DISCUSSION ITEMS

KEY POINTS
The Bull Trout/Resident Fish Subteam met to review and discuss the 2023 Trapping and Stranding Draft Study Plan. Discussion focused on clarifying questions and considerations for the Project Team as they move towards finalizing the Study Plan and conducting the Study.

KEY POINTS
The Subteam discussed the field verification process, including the level of effort, timing, water surface elevation conditions, and the proportion of the total area that will be subsampled. The Subteam also discussed the intent of the field verification, noting that field-verification of desktop results will be the primary focus, while opportunistically documenting focal fish species if they are present. Subteam members suggested that additional focus might be necessary in the side channel areas around the Wenatchee River since this area may dewater faster than areas around the mainstem. Subteam members also suggested bringing a hand wand to opportunistically scan any fish encountered for a PIT tag.
The Bull Trout/Resident Fish Subteam also reviewed the Issue Statements List for Bull Trout. The Subteam asked clarifying questions about the Issues Statements and shared various resource interests, such as assessing datasets for adult and subadult fish together and the challenges of conducting a statistically valid study on subadult Bull Trout passage given the limited sample size available.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-02-14 Fish and Aquatic TWG Agenda
Minutes	Presentation	2023-02-14 Fish and Aquatic TWG Bull Trout Resident Fish Subteam Presentation
Minutes	Comments	Fish & Aquatics February 2023 Issue Statements List

ROCK ISLAND RELICENSING
FISH & AQUATIC TWG
PACIFIC LAMPREY SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: February 14, 2023
TIME: 12:30 p.m. – 2:00 p.m. Pacific Standard Time (PST)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Review and discuss the draft 2023 Larval Varial Zone Study Plan
- Provide update on 2023 Adult Infrastructure Fishway Assessment
- If time allows, walk-through Pacific Lamprey Issues List
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Four Peaks Environmental	Miller, Joe	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Four Peaks Environmental	Murauskas, Joshua	Yes
Confederated Tribes of the Colville Reservation	Truscott, Kirk	Yes
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Bureau of Indian Affairs	Lewis, Steve	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from February 14th Pacific Lamprey Subteam Meeting.	2/21/23
Chelan PUD	Circulate Issue Statements List.	2/21/23
Chelan PUD	Incorporate comments received from Subteam members and send the final Draft 2023 Larval Pacific Lamprey Varial Zone Study Plan for a 10-business day review period via SmartComment.	3/1/23
Pacific Lamprey Subteam	Review and discuss remaining Pacific Lamprey issue statement (#3) during a future Subteam meeting.	5/9/23

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS:
The Pacific Lamprey Subteam met to review and discuss the Draft 2023 Larval Pacific Lamprey Varial Zone Study Plan. Discussion focused on clarifying questions and considerations for the Project Team as they move towards finalizing the Study Plan and conducting the Study.
The Subteam discussed clearly defining the life stages that this Study will address (larval only or larval and juvenile) as well as the different habitat types that will be analyzed (Type I and Type II). The Subteam also discussed the field verification process, including the timing and the proportion of the total area that will be subsampled, and the factors that will inform the quantitative risk analysis, including dewatering rates, duration, and moisture. Subteam

KEY DISCUSSION ITEMS:
members suggested that the Project Team (Chelan PUD and Consultants) document any potential predation signs that are observed (e.g., lamprey or predator tracks) and that they bring a hand wand to scan any lamprey encountered for a PIT tag.
The Project Team provided an update on the execution of the 2023 Adult Pacific Lamprey Infrastructure Assessment. The execution of the assessment is ongoing and the Subteam is anticipated to discuss the Draft Assessment Report in May.
The Pacific Lamprey Subteam also began reviewing the Issue Statements List for Pacific Lamprey. The Subteam asked clarifying questions about the Issues Statements and shared various resource interests, such as juvenile Pacific Lamprey survival, predation, and fish passage.

PARKING LOT ITEMS:

NEW Parking Lot Item

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-02-14 Fish and Aquatic TWG Pacific Lamprey Agenda
Minutes	Presentation	2023-02-14 Fish and Aquatic TWG Pacific Lamprey Presentation
Minutes	Comments	Fish & Aquatics February 2023 Issue Statements List

ROCK ISLAND RELICENSING
RECREATION & LAND USE TWG

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: February 16, 2023
TIME: 9:00 a.m. – 11:00 a.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Review status of recreation inventory report.
- Present draft recreation use study plan.
- Discuss initial review of draft recreation use study plan.
- Confirm next steps and action items.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Wenatchee Row and Paddle Club	Thorson, Eric	Yes
Washington State Parks	Patnode, Brian	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
US Fish and Wildlife Service	Riggs, Randi	No
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
US Bureau of Reclamation	Hoff, Gina	No
US Bureau of Land Management	Bryan, Curtis	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Land Management	Russell, Katherine	No
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	No
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
Kearns & West	Downing, Jim	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Kennedy, Katy	Yes
Individual	Hays, Steve	No
Individual	King, John	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	Yes
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
City of Wenatchee	Gloria, Laura	No
City of Rock Island	Duffy, Charity	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of East Wenatchee	Lillquist, Curtis	No
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Smith, Michelle	No
Chelan County Public Utility District No. 1	Ulrich, Janel	No
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Audubon Society	McCammon, Bruce	Yes
American Whitewater	O'Keefe, Thomas	No
American Rivers	Moran, Bridget	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
Chelan PUD	Circulate final February 16th Recreation & Land Use TWG meeting summary.	2/23/2023
Chelan PUD	Circulate response to comments on Recreation Inventory Report.	3/3/2023
Chelan PUD	Circulate Draft Recreation Use Study Plan for comment.	3/3/2023
Chelan PUD	Follow up with Jerrmaine Treadwell, USFWS, to discuss USFWS representation on the TWG.	3/16/2023
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing

KEY DISCUSSION POINTS:

KEY POINTS
During the Thursday, February 16, 2023 Recreation & Land Use TWG, the TWG received an update from Chelan PUD on the Recreation Inventory Report as well as an overview of the Draft Recreation Use Study Plan. TWG participants provided feedback on the Draft Recreation Use Study Plan.
At the next Recreation & Land Use TWG meeting, which will be held Thursday, March 16th, the TWG will discuss the Recreation Use Study Plan and may have the opportunity for an optional in-person site visit.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
None

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-02-16 Recreation & Land Use TWG Agenda
Minutes	Presentation	2023-02-16 Recreation & Land Use TWG Presentation
Minutes	Report	RI Recreation Inventory Draft Report
Minutes	Study Plan	RI Recreation Use Study Plan DRAFT

ROCK ISLAND RELICENSING
FISH AND AQUATICS
MACROPHYTES SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: March 14, 2023

TIME: 9:00 a.m. – 10:00 a.m. Pacific Daylight Time (PDT)

LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 285 574 53#

MEETING PURPOSE

- Review and discuss the draft 2023 Macrophytes Study Plan
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Ecology	Glisson, Wes	Yes
US Fish and Wildlife Service	Nelle, R.D.	No
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
US Bureau of Reclamation	Hoff, Gina	Yes
Kleinschmidt Associates	Thompson, Audrey	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Environmental Assessment Services	Elias, Becky	Yes
Environmental Assessment Services	Paulsen, Matt	Yes
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Columbia River Inter-Tribal Commission	Skiles, Tom	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan County Public Utility District No. 1	Truscott, Ben	No
Chelan County Public Utility District No. 1	Clement, Marcie	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Bureau of Indian Affairs	Lewis, Steve	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from March 14 Macrophytes Subteam meeting.	03/21/22
Chelan PUD	Incorporate comments received from Subteam members and send the final Draft 2023 Macrophytes Study Plan for a 10-business day review period via SmartComment.	03/31/22

KEY DISCUSSION ITEMS:

KEY POINTS
The Macrophytes Subteam met to review and discuss the Draft 2023 Macrophytes Study Plan. Matt Paulsen and Becky Elias, Environmental Assessment Services (EAS), described the study goals and objectives, methodology, and anticipated timeline. Discussion focused on clarifying questions and considerations for the Project Team as they move toward finalizing the Study Plan and conducting the Study. The Subteam discussed whether the study team anticipates any challenges in using aerial imagery to locate submerged macrophyte beds. The study team shared that they have high resolution imagery that will be used as a guide and a starting point, while field surveys will be conducted to supplement and verify the initial analysis of aerial imagery. The Subteam also asked if the GIS layer can be shared with stakeholders at some point in the future.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-03-14 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-03-14 F&A TWG Macrophytes Subteam Facilitator Slides
Minutes	Study Plan	RI Study Plan Macrophytes - DRAFT

ROCK ISLAND RELICENSING
RECREATION & LAND USE TWG

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: March 16, 2023

OPTIONAL SITE VISIT

TIME: 9:00 a.m. – 11:00 a.m. Pacific Standard Time (PST)

LOCATION: Wenatchee Confluence State Park North
Meeting place – Drive past guard shack and turn into first parking lot on left.
333 Olds Station Road, Wenatchee, WA 98801

TWG MEETING

TIME: 11:00 a.m. – 12:00 p.m. PST

LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Meet in person.
- Visit Wenatchee Confluence State Park North.
- Discuss Recreation Use Study Plan.
- Confirm next steps and action items.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	McCammon, Bruce	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Ulrich, Janel	No
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Duffy, Charity	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	No
Individual	Hays, Steve	No
Individual	King, John	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Downing, Jim	Yes
Kearns & West	Kennedy, Katy	Yes
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
US Bureau of Land Management	Russell, Katherine	No
US Bureau of Land Management	Bryan, Curtis	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
US Bureau of Land Management	Priebe, Diane	No
US Bureau of Reclamation	Hoff, Gina	No
US Fish and Wildlife Service	Riggs, Randi	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Foster, Colleen	No
Washington State Parks	Harris, Chelsea	No
Washington State Parks	Patnode, Brian	No
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
Chelan PUD	Circulate final March 16th Recreation & Land Use TWG meeting summary.	3/23/2023
Chelan PUD	Follow up with participating TWG members to assess interest in developing a Rec Use and Needs Study Plan to include in the PAD. Provide ILP study schedule to help inform our options.	5/1/2023

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing

KEY DISCUSSION POINTS

KEY POINTS
TWG members visited Wenatchee Confluence State Park North, heard presentations from Washington State Parks and Chelan PUD on how they co-manage the park, and discussed recreation use, amenities, and management for this site.
During the Thursday, March 16, 2023 Recreation & Land Use TWG, the TWG received updates from Chelan PUD on Wenatchee Riverfront Park, Coyote Dunes, and Walla Walla Point Park, and the potential Chelan County Malaga Park. Chelan PUD provided an update on the current development of the Recreation Use Study Plan, and notified the TWG that data collection will not be completed this year. In conjunction with this update, Chelan PUD proposed to combine the Recreation Use and Needs Studies and work on that study plan with TWG members over the next several months. The study plan would be submitted with the PAD and implemented in 2025 during relicensing. Chelan PUD will be seeking stakeholder input on this proposed plan.
The next Recreation & Land Use TWG meeting is tentative, if held, it will be Thursday, May 18th, the TWG will discuss a draft outline for the Recreation Use and Needs Study.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
None

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-03-16 Recreation & Land Use TWG Agenda
Minutes	Presentation	2023-03-16 Recreation & Land Use TWG Facilitator Slides
Minutes	Presentation	2023 March Pool Flux Model Information Presentation

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: March 16, 2023
TIME: 12:00 p.m. – 2:15 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 1-253-999-5697 Enter Conference ID: 804131431#

MEETING PURPOSE:

- Provide updates on studies, reviews, and summaries that will inform consideration of the comments in the Wildlife & Botanical issues list. Discuss with Technical Working Group members.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	McCammon, Bruce	No
Audubon Society	Johnston, Mark	Yes
Beck Botanical Services	Beck, Katy	No
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Cordell, Kelly	No
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
City of Rock Island	Laughlin, Brock	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	No
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	No
Individual	Hays, Steve	No
Kearns & West	Hessenius, Angela	No
Kearns & West	Rugani, Kelsey	No
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Downing, Jim	Yes
Kearns & West	Kennedy, Katy	Yes
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	Yes
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	Yes
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Riggs, Randi	No
US Fish and Wildlife Service	Treadwell, Jerrmaine	No
US Fish and Wildlife Service	Orling, Emily	Yes
US Bureau of Land Management	Clark, Linda	No
US Bureau of Land Management	Clark, Lisa	No
US Bureau of Land Management	Ellis, Erik	No
Washington Native Plant Society	Ballinger, Susan	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Miller, Jesse	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

KEY POINTS

KEY POINTS
Peter Vanney, Chelan PUD, presented an overview of the results of the pool fluctuation modeling, including the analysis methods and how the results will be used.
Chelan PUD provided a presentation on black cottonwood mapping within the Rock Island Project. The TWG also heard updates on the water quality study and an update on anticipated timelines for the avian predation and primary transmission line avian summaries.
The next Wildlife & Botanical TWG meeting will likely be in the second quarter of 2023. It will be scheduled when significant new information from the summaries/reviews noted above is ready to be shared and discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate the Pool Flux Modeling presentation.	3/23/23
Chelan PUD	Circulate summary from March 16 Wildlife & Botanical TWG meeting.	3/23/23
Chelan PUD	Provide regular updates on studies, summaries, and evaluations that will help to inform discussions of potential project effects and project nexus for W&B issues. These efforts include the water quality study (crosswalking with others TWGs as necessary), the piscivorous bird summary, the primary transmission line avian summary, the Rock Island pool fluctuation model, and black cottonwood mapping.	Ongoing
Chelan PUD/TWG Members	Review W&B comment matrix, considering new information from recent studies, summaries, and evaluations. Consider developing new issue statements as appropriate.	Q2 2023 (next W&B TWG meeting)
TWG Members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org) or Jim/Kearns & West (jdowning@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-03-16 Wildlife & Botanical TWG Agenda
Minutes	Presentation	2023-03-16 Wildlife and Botanical TWG Facilitator Slides
Minutes	Presentation	2023 March Pool Flux Model Information Presentation

ROCK ISLAND RELICENSING
WILDLIFE & BOTANICAL TWG
RARE, THREATENED, AND ENDANGERED PLANTS SUBTEAM
MEETING SUMMARY
ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: March 16, 2023
TIME: 2:30 p.m. – 3:30 p.m. Pacific Standard Time (PST)
LOCATION: Click here to join the meeting or Call-in Dial: 1-253-999-5697 Enter Conference ID: 595 229 347#

MEETING PURPOSE:

- Confirm Rare, Threatened, and Endangered Plants Subteam.
- Review draft RTE Plants report.
- Confirm next steps and action items.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Bureau of Land Management	Boyter, Molly	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Cordell, Kelly	No
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Kearns & West	Downing, Jim	Yes
Kearns & West	Kennedy, Katy	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
US Fish and Wildlife Service	Orling, Emily	Yes
Washington State Dept of Natural Resources	Miller, Jesse	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

KEY POINTS

KEY POINTS
During the March 16 RTE Plants Subteam meeting, the draft RTE Plants Report was reviewed. The subteam also discussed the proposed monitoring/management efforts for the Ute ladies'-tresses population on Rock Island.
Chelan PUD stated that PM&E measures will be discussed during the formal relicensing process.
The subteam agreed to convene immediately following the next Rocky Reach Ute ladies'-tresses Subcommittee meeting in November 2023.
With her USFWS colleagues, Emily Orling will review the requirement for three consecutive years of surveying in the USFWS Ute ladies'-tresses survey protocol (given that Ute ladies'-tresses populations were identified in the first survey year).

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Von Pope	Share with Emily Orling at USFWS the Ute ladies'-tresses survey protocol document (regarding the question of the requirement for three consecutive years of surveying).	Complete
Emily Orling	Review the need for three consecutive years of surveying the Ute ladies'-tresses according to ULT survey protocol.	Ongoing
Chelan PUD	Share the revised RTE Plants Report with the Subteam as a PDF.	3/31/23
RTE Plants Subteam Members	Provide comments on the RTE Plants Report within two weeks/ten business days of receiving the RTE Plants Report.	Ten business days after receipt of the report
TWG Members	Reach out to Ben/Chelan PUD (Ben.Truscott@chelanpud.org) or Jim/Kearns & West (jdowning@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Email	Agenda	2023-03-16 Wildlife & Botanical TWG Agenda
Email	Presentation	2023-03-16 RTE Plants subteam Facilitator Slides (Attached in Email with Meeting Summary)

ROCK ISLAND RELICENSING
FISH & AQUATICS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: April 11, 2023
TIME: 9:00 a.m. – 10:15 a.m. Pacific Daylight Time (PDT)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Provide updates on related Chelan PUD efforts and current Fish & Aquatic TWG Studies
- Check-in on early engagement process
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	Yes
Audubon Society	Johnston, Mark	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	Yes
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	Yes
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Clement, Marcie	No
Chelan County Public Utility District No. 1	Odell, Brian	No
Chelan County Public Utility District No. 1	Underwood, Alene	No
Chelan County Public Utility District No. 1	Willard, Catherine	No
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan County Public Utility District No. 1	Vanney, Peter	Yes
Chelan County Public Utility District No. 1	Clark, Laura	Yes
City of Rock Island	Laughlin, Brock	No
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Columbia River Inter-Tribal Commission	Skiles, Tom	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	No
Confluence Environmental Company	Doyle, Eric	No
Environmental Assessment Services	Paulsen, Matt	Yes
Four Peaks Environmental	Murauskas, Joshua	No
Four Peaks Environmental	Nagel, Leah	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Kearns & West	Day, Mary Beth	No
Kearns & West	Downing, Jim	No
Kearns & West	Kennedy, Katy	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Deason, Jeff	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kleinschmidt Associates	Thompson, Audrey	Yes
National Oceanic & Atmospheric Administration	Yeager, Justin	No
National Oceanic & Atmospheric Administration	Carlon, Scott	Yes
Northwest Hydraulic Consultants	Stuart, Derek	Yes
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
US Bureau of Reclamation	Archuleta, Shannon	No
US Bureau of Reclamation	Hoff, Gina	Yes
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Muir, Kenneth	No
US Fish and Wildlife Service	Gale, William	Yes
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Romine, Jason	Yes
US Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Burgess, Dave	No
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Dept of Natural Resources	Huinker, James	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from April 11th Fish & Aquatic TWG meeting.	4/18/23
TWG Members	Review the Pool Fluctuation Model presentation and reach out to Chelan PUD (RIRelicensing@chelanpud.org) with any questions.	4/25/23
TWG Members	Reach out to Chelan PUD (RIRelicensing@chelanpud.org) if you are interested in joining the Mussels Subteam.	4/25/23
Chelan PUD/Kearns & West	Consider the timing of the next full F&A TWG Meeting and whether it would be beneficial to hold a meeting prior to August/September to share more information about the transition from Early Engagement to the formal relicensing process.	5/9/23
Chelan PUD	Maintain 2023 TWG and Subteam meetings schedule.	Ongoing
TWG Members	Provide relevant studies or reports to Chelan PUD/Kearns & West.	Ongoing

KEY DISCUSSION POINTS:

KEY POINTS
During the Tuesday, April 11 Fish & Aquatic TWG meeting, the TWG members received an update from Chelan PUD on related efforts, including a presentation from Peter Vanney, Chelan PUD, on the Pool Fluctuation Model that will serve as background information for several studies related to Fish & Aquatics and other resource areas. TWG members sought clarification on and discussed the data included in the model and whether those data capture the full range of seasonal flows and potential hydrological conditions (e.g., high and low water years, extreme events). Peter shared that the model was calibrated with data from 2018-2022 and these data cover the range of flows observed in the project area. TWG members also asked if this model could show the rate of change of shoreline elevation. Peter shared that this is dependent on several factors and could be investigated further by using the model and analyzing other inputs.
The TWG members also discussed Fish & Aquatic Study updates, including a recap of progress made during Quarter 1 of 2023, the current anticipated 2023 TWG Subteam Schedule, and the

anticipated timeline for developing and finalizing the study plans, study implementation, and study reports for each of the 2023 Early Engagement Studies. Chelan PUD also announced the intention to form a Mussels Subteam that will likely meet in summer 2023 to discuss potential next steps related to mussels in early engagement and formal relicensing. The TWG members also heard an update on the Issue Statements that have been discussed within the appropriate Subteams and reviewed the timeframes for upcoming study plan and study report review.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-04-11 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-04-11 Fish & Aquatics TWG Facilitator Slides
Minutes	Presentation	Pool Flux Model Information Presentation

ROCK ISLAND RELICENSING
WATER QUALITY MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: April 11, 2023
TIME: 12:30 p.m. – 1:30 p.m. Pacific Daylight Time (PDT)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Review and discuss the Interim Water Quality Monitoring Study Report
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Bureau of Indian Affairs	Lewis, Steve	Yes
Chelan County Public Utility District No. 1	Clark, Laura	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Clement, Marcie	No
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	Yes
Environmental Assessment Services	Paulsen, Matt	No
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Nagel, Leah	Yes
Kearns and West	Rugani, Kelsey	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kearns and West	Hessenius, Angela	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
US Bureau of Reclamation	Hoff, Gina	Yes
US Fish and Wildlife Service	Callaway, Tara	No
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Treadwell, Jerrmaine	No
US Fish and Wildlife Service	Neibauer, Judy	Yes
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Romine, Jason	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Ecology	Bugica, Kalman	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from April 11th Water Quality Subteam meeting.	04/18/23
Chelan PUD	Consider input from Subteam members on the draft interim study report as draft final study report is developed.	TBD (anticipated September 2023)

KEY DISCUSSION ITEMS:

KEY POINTS
The Water Quality Subteam met to review and discuss the Interim Water Quality Monitoring Study Report. Pradeep Muganthan, Four Peaks Environmental, reviewed the summary results and key takeaways from the study report. Discussion focused on clarifying questions and considerations for the project team as they move forward in implementing the study and finalizing the study report. Subteam members asked clarifying questions about the number of sampling sites, depths, and specific locations. Subteam members also asked whether this study includes toxics data. Pradeep shared that toxics are outside the scope of this study and that existing information will be included in the PAD. Subteam members asked whether the project team would consider conducting transects for invertebrates. Pradeep shared that invertebrate transects are outside the scope of this study. Subteam members asked if the

project team has compared the data collected to other areas and suggested that comparing the data to other areas upstream and downstream would be valuable.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-04-11 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-04-11 Water Quality Subteam Presentation

ROCK ISLAND RELICENSING
WHITE STURGEON MEETING SUMMARY

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: April 11, 2023
TIME: 10:30 a.m. – 11:30 a.m. Pacific Daylight Time (PDT)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Review and discuss the draft White Sturgeon Population Indexing Study Report
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Blue Leaf	Wright, Corey	Yes
Bureau of Indian Affairs	Lewis, Steve	Yes
Chelan County Public Utility District No. 1	Clark, Laura	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Patterson, Nathan	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Colville Reservation	McLellan, Jason	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kleinschmidt Associates	Thompson, Audrey	Yes
US Bureau of Reclamation	Hoff, Gina	Yes
US Fish and Wildlife Service	Kokos, Sonja	No
US Fish and Wildlife Service	Nelle, R.D.	Yes
US Fish and Wildlife Service	Romine, Jason	Yes
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from April 11th White Sturgeon Subteam meeting.	04/18/23
Chelan PUD	Finalize draft study report, considering input from Subteam members and incorporating genetics data.	TBD, as genetics data is available. (anticipated June 2023)

KEY DISCUSSION POINTS:

KEY POINTS
The White Sturgeon Subteam met to review and discuss the Draft White Sturgeon Population Indexing Study Report. Corey Wright, Blue Leaf Environmental, reviewed the results and key takeaways from the study report. Discussion focused on clarifying questions and considerations for the project team as they move toward finalizing the study report. Subteam members discussed the challenges involved in estimating abundance for larger fish that might not be vulnerable to the gear/hook sizes used and suggested adding some discussion of this to the study report. Subteam members also asked if the project team has compared growth rates of supplementation fish from upriver to growth rates observed in other reservoirs. The project team shared that this analysis has not been done yet, but they could acquire data to do this comparison with some assumptions. Subteam members also asked about the carrying capacity of the Rock Island Reservoir, and the project team shared that this information is unknown.
The Subteam asked if there is a need to conduct additional sampling for a second year. Corey shared that he does not suggest repeating this study because it entailed substantial effort, and an additional year of study is not expected to change the population abundance estimates and characterization significantly and therefore would not likely provide a lot of useful information.

Subteam members agreed with this assessment and suggested that the team consider other types of surveys in formal relicensing that might provide different information.
The Subteam also discussed the genetic samples being analyzed by CRITFC. Corey shared that the DNA samples are being analyzed currently, which is sooner than originally anticipated. The project team is specifically interested in whether it is possible to confirm that wild fish spawning occurred in the Rock Island Reservoir by confirming that the wild fish encountered were related to CRITFC fish. The Subteam decided to wait until the genetic information is available to incorporate before finalizing the study report. The Subteam will meet again once the genetic information is available and analyzed, likely in June or July 2023.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-04-11 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-04-11 White Sturgeon Subteam Presentation
Minutes	Reference Document	Population Structure of White Sturgeon (Acipenser transmontanus) in the Columbia River Inferred from Single-Nucleotide Polymorphisms

ROCK ISLAND RELICENSING
2023 Q1-Q2 MANAGERS MEETING

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: April 18, 2023
TIME: 10:00 – 11:00 a.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Meeting ID: 143 017 482

MEETING PURPOSE:

- Provide an overview of the Rock Island Hydroelectric Project relicensing and Early Engagement process.
- Provide an update on the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use TWGs including progress to date and upcoming discussions.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	Johnston, Mark	No
Audubon Society	McCammon, Bruce	No
Beck Botanical Services	Beck, Katy	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Bureau of Indian Affairs	Hatch, Keith	No
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Mercier, Bryan	No
Bureau of Indian Affairs	Peone, Rudy	No
Bureau of Indian Affairs	Peterson, Harold	Yes
Cascade Fisheries	Lundgren, Jason	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1	Clement, Marcie	No
Chelan County Public Utility District No. 1	Cordell, Kelly	No
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Odell, Brian	No
Chelan County Public Utility District No. 1	Underwood, Alene	No
Chelan County Public Utility District No. 1	Willard, Catherine	No
Chelan County Public Utility District No. 1	Baker, Ryan	Yes
Chelan County Public Utility District No. 1	Clark, Laura	Yes
Chelan County Public Utility District No. 1	Erickson, Justin	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Chelan County Public Utility District No. 1	Pope, Von	Yes
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Duffy, Charity	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Commission	Barton, Diane	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Columbia River Inter-Tribal Commission	Parker, Blaine	No
Columbia River Inter-Tribal Commission	Porter, Lauri	No
Columbia River Inter-Tribal Commission	Skiles, Tom	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Barney, Casey	No
Confederated Tribes and Bands of Yakama Nation	Blodgett, David	No
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Lally, Jessica	No
Confederated Tribes and Bands of Yakama Nation	Miller, Donella	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark	No
Confederated Tribes and Bands of Yakama Nation	Oliver, Noah	No
Confederated Tribes and Bands of Yakama Nation	Rigdon, Phil	No
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon	No
Confederated Tribes and Bands of Yakama Nation	Valdez, Kate	No
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Colville Reservation	Baldwin, Casey	No
Confederated Tribes of the Colville Reservation	Cook, Jacqueline	No
Confederated Tribes of the Colville Reservation	Davis, John	No
Confederated Tribes of the Colville Reservation	Desautel, Cody	No
Confederated Tribes of the Colville Reservation	Marconi, Douglas	No
Confederated Tribes of the Colville Reservation	McLellan, Jason	No
Confederated Tribes of the Colville Reservation	Miller, Crystal	No
Confederated Tribes of the Colville Reservation	Nine, Bret	No
Confederated Tribes of the Colville Reservation	Rushing, Sam	No
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Confederated Tribes of the Colville Reservation	Whitney, Richard	No
Confederated Tribes of the Colville Reservation	Moura, Guy	Yes
Confederated Tribes of the Colville Reservation	Rollins, Renata	Yes
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent	No
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie	No
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl	Yes
Confluence Environmental Company	Doyle, Eric	No
Department of Archaeology and Historic Preservation	Borth, Holly	No
Department of Archaeology and Historic Preservation	Brooks, Allyson	No
Department of Archaeology and Historic Preservation	Houser, Michael	No
Department of Archaeology and Historic Preservation	Whitlam, Rob	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	No
Environmental Assessment Services	Paulsen, Matt	No
Four Peaks Environmental	Nagel, Leah	No
Four Peaks Environmental	Miller, Joe	Yes
Four Peaks Environmental	Mugunthan, Pradeep	Yes
Four Peaks Environmental	Murauskas, Joshua	Yes
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Individual	King, John	No
Kearns & West	Downing, Jim	No
Kearns & West	Kennedy, Katy	No
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Keefe, MaryLouise	No
Kleinschmidt Associates	Thompson, Audrey	No
Kleinschmidt Associates	Deason, Jeff	Yes
Kleinschmidt Associates	Denis, Nathalie	Yes
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Steimle, Kai	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
National Oceanic & Atmospheric Administration	Carlon, Scott	No
National Oceanic & Atmospheric Administration	Yeager, Justin	No
National Oceanic & Atmospheric Administration	Graves, Ritchie	Yes
National Park Service	Rosebrough, Susan	No
Northwest Power and Conservation Council	Horton, Stacy	No
Northwest Power and Conservation Council	Mounts, Sara	No
U.S. Bureau of Land Management	Bailey, Richard	No
U.S. Bureau of Land Management	Boyter, Molly	No
U.S. Bureau of Land Management	Clark, Linda	No
U.S. Bureau of Land Management	Clark, Lisa	No
U.S. Bureau of Land Management	Ellis, Erik	No
U.S. Bureau of Land Management	Pindel, Kurt	No
U.S. Bureau of Land Management	Priebe, Diane	No
U.S. Bureau of Land Management	Russell, Katherine	No
U.S. Bureau of Land Management	Bryan, Curtis	Yes
U.S. Bureau of Reclamation	Archuleta, Shannon	No
U.S. Bureau of Reclamation	Hoff, Gina	No
U.S. Fish and Wildlife Service	Callaway, Tara	No
U.S. Fish and Wildlife Service	Kokos, Sonja	No
U.S. Fish and Wildlife Service	McDowell, Tom	No
U.S. Fish and Wildlife Service	Muir, Kenneth	No
U.S. Fish and Wildlife Service	Neibauer, Judy	No
U.S. Fish and Wildlife Service	Nelle, R.D.	No
U.S. Fish and Wildlife Service	Orling, Emily	No
U.S. Fish and Wildlife Service	Riggs, Randi	No
U.S. Fish and Wildlife Service	Romine, Jason	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
U.S. Fish and Wildlife Service	Thompson, Brad	No
U.S. Fish and Wildlife Service	Treadwell, Jerrmaine	No
U.S. Fish and Wildlife Service	Gale, William	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
Washington Native Plant Society	Ballinger, Susan	No
Washington State Department of Ecology	Oreiro, Tyson	No
Washington State Department of Ecology	Park, Sage	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Roberts, Damon	Yes
Washington State Department of Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Burgess, Dave	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Garrity, Michael	No
Washington State Department of Fish and Wildlife	Hoenes, Brock	No
Washington State Department of Fish and Wildlife	Jackson, Chad	No
Washington State Department of Fish and Wildlife	Jeffreys, Emily	No
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike	No
Washington State Department of Fish and Wildlife	Murdoch, Andrew	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Huinker, James	No
Washington State Dept of Natural Resources	Miller, Jesse	No
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Herzog, Peter	No
Washington State Parks	Layton, Ryan	No
Washington State Parks	Patnode, Brian	No
Washington State Parks	Sternback, Mike	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	Yes
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Managers	Reach out to Chelan PUD (RIRelicensing@chelanpud.org) if you are interested in joining the Mussels Subteam.	4/25/2023
TWG Managers	Review presentation from April 18 TWG Manager's Meeting and reach out to RIRelicensing@chelanpud.org with any questions.	Ongoing
TWG Managers	Reach out to Janel Ulrich (janel.ulrich@chelanpud.org) or Kelsey Rugani (krugani@kearnswest.com) to provide input on TWG Manager's Meetings and/or to check-in on the Early Engagement process.	Ongoing
Chelan PUD	Circulate final meeting summary from April 18 TWG Manager's Meeting.	4/25/23
Chelan PUD	Add Harold Peterson (BIA) to distribution lists for Water Quality Subteam and Wildlife & Botanical TWG.	4/25/23
Chelan PUD	Schedule the next quarterly TWG Manager's Meeting.	Q3 of 2023

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, April 18 TWG Manager's Meeting, Chelan PUD provided an overview of the Rock Island Hydroelectric Project and Early Engagement process as well as progress of the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use TWGs, including updates on ongoing studies and evaluations.
The TWG Manager's group will meet on a quarterly basis. The next meeting will be scheduled in Quarter 3 of 2023.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-04-18 TWG Managers Group Agenda
Minutes	Presentation	2023-04-18 TWG Managers Group Presentation
Minutes	Presentation	Pool Flux Model Information Presentation

ROCK ISLAND RELICENSING
FISH & AQUATIC TWG
PACIFIC LAMPREY SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: May 9, 2023

TIME: 9:00 a.m. – 10:00 a.m. Pacific Daylight Time (PDT)

LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 652 695 360#

MEETING PURPOSE:

- Review and discuss the draft 2023 Adult Pacific Lamprey Infrastructure Fishway Assessment.
- If time allows, finish walking-through Pacific Lamprey Issues List.
- Confirm next steps and action items.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Bureau of Indian Affairs	Lewis, Steve	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	No
Chelan County Public Utility District No. 1	Tousciuk, John	No
Chelan County Public Utility District No. 1	Clark, Laura	Yes
Chelan County Public Utility District No. 1	Hopkins, Scott	Yes
Chelan County Public Utility District No. 1	Towey, William	Yes
Chelan County Public Utility District No. 1	Truscott, Ben	Yes
Chelan County Public Utility District No. 1	Keller, Lance	Yes
Columbia River Inter-Tribal Commission	Porter, Lauri	Yes
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph	Yes
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	Yes
Confederated Tribes of the Colville Reservation	Truscott, Kirk	No
Four Peaks Environmental	Miller, Joe	No
Four Peaks Environmental	Murauskas, Joshua	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Thompson, Audrey	No
Kleinschmidt Associates	Denis, Nathalie	Yes
U.S. Fish and Wildlife Service	Kokos, Sonja	No
U.S. Fish and Wildlife Service	Neibauer, Judy	No
U.S. Fish and Wildlife Service	Nelle, R.D.	No
U.S. Fish and Wildlife Service	Treadwell, Jerrmaine	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	No
Washington State Department of Fish and Wildlife	Heironimus, Laura	Yes

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from May 9th Pacific Lamprey Subteam meeting.	5/16/23
Chelan PUD	Incorporate comments received from Subteam members and send the final Draft 2023 Adult Pacific Lamprey Infrastructure Fishway Assessment Report for a 10-business day review period via SmartComment.	5/18/23
Pacific Lamprey Subteam	Discuss potential next steps based on the 2023 Adult Pacific Lamprey Infrastructure Assessment Report findings during a future Subteam meeting.	8/9/23
Pacific Lamprey Subteam	Review and discuss remaining Pacific Lamprey issue statement (#3) during a future Subteam meeting.	8/9/23

KEY DISCUSSION POINTS:

KEY POINTS
The Pacific Lamprey Subteam met to review and discuss the Draft 2023 Adult Pacific Lamprey Infrastructure Assessment Report. Josh Murauskas, Four Peaks Environmental, reviewed the results and key takeaways from the report. Discussion focused on clarifying questions and considerations for the project team as they move toward finalizing the study report. Subteam members asked clarifying questions about the purpose of certain infrastructure features and pointed out corrections to specific lines and figure captions. Subteam members noted that some of the text is difficult to understand given the complexity of infrastructure but that the photo documentation is helpful. Subteam members also suggested that if possible, adding a summary of the unique features of each fish ladder would be helpful. The project team responded that this is difficult to accomplish since the fishways are very different from each other, so each section of the report aims to highlight the uniqueness of each fishway.
Subteam members asked if the project team identified any areas that are the most likely to potentially affect adult lamprey passage. The project team shared that it is difficult to draw conclusions at this time without additional empirical information on water velocity and lamprey passage. The team added that these fishways are typical of what is seen throughout the mid-Columbia River and that further discussions are needed to identify next steps.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-05-09 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-05-09 Pacific Lamprey Subteam Facilitator Slides

ROCK ISLAND RELICENSING
RECREATION & LAND USE TWG

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: Thursday, May 18, 2023
TIME: 9:00 a.m. – 10:30 a.m. Pacific Daylight Time (PDT)
LOCATION: In person: Confluence Technology Center (CTC) 285 Technology Center Way Ste 102, Wenatchee, WA 98801

Virtual: **Click here to join the meeting** or Call-in Dial: 253-999-5697 Enter Conference ID: 804 131 431#

MEETING PURPOSE:

- Review Recreation materials and resources online
- Discuss Draft Recreation Use & Needs Study Plan Outline
- Confirm next steps and action items

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	McCammon, Bruce	No
Bureau of Indian Affairs	Lewis, Steve	No
Bureau of Indian Affairs	Peone, Rudy	No
Chelan County Public Utility District No. 1	Baker, Ryan	No
Chelan County Public Utility District No. 1	Clark, Laura	Yes
Chelan County Public Utility District No. 1	Heit, Ray	No
Chelan County Public Utility District No. 1	Shales, Matt	Yes
Chelan County Public Utility District No. 1	Taylor, Kate	Yes
Chelan County Public Utility District No. 1	Ulrich, Janel	Yes
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
Chelan Douglas Regional Port Authority	Larsen, Craig	No
City of East Wenatchee	Lillquist, Curtis	No

City of Rock Island	Duffy, Charity	Yes
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Commission	Carter, Julie	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine	No
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	No
Hurst Landing Estates Homeowners	Schaffer, Cal	Yes
Individual	Hays, Steve	No
Individual	King, John	Yes
Kearns & West	Day, Mary Beth	Yes
Kearns & West	Downing, Jim	Yes
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Kennedy, Katy	No
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates	Deason, Jeff	No
Kleinschmidt Associates	Denis, Nathalie	No
Kleinschmidt Associates	Oswald, Fatima	Yes
Kleinschmidt Associates	Whelpley, Angela	Yes
U.S. Bureau of Land Management	Bryan, Curtis	No
U.S. Bureau of Land Management	Priebe, Diane	No
U.S. Bureau of Land Management	Russell, Katherine	No
U.S. Bureau of Reclamation	Hoff, Gina	No
Washington State Department of Ecology	Peterschmidt, Mark	No
Washington State Department of Ecology	Zimmerman, Breean	No
Washington State Department of Fish and Wildlife	Blank, Benjamin	No
Washington State Department of Fish and Wildlife	Finger, Richard	No
Washington State Department of Fish and Wildlife	Verhey, Patrick	Yes
Washington State Dept of Natural Resources	Preston, Cindy	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Harris, Chelsea	No
Washington State Parks	Patnode, Brian	No
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Share any additional feedback on the Draft Recreation Use & Needs Study Plan Outline with Chelan PUD, including suggestions for additional existing sources of information to include.	5/26/23
TWG Members	Reach out to Matt/Chelan PUD if you are not on the Recreation & Land Use TWG calendar invitation and would like to be added.	Ongoing
TWG Members	Reach out to Matt/Chelan PUD (matt.shales@chelanpud.org, 509-661-4868) or Mary Beth/Kearns & West (mbday@kearnswest.com) if you have any input or questions on the TWG process generally, particularly on TWG members' needs in preparing for participating in the TWG meetings.	Ongoing
Chelan PUD	Circulate final May 18th Recreation & Land Use TWG meeting summary.	5/25/2023
Chelan PUD	Crosswalk comments and topics between TWGs and, when appropriate, report out from the other TWGs to ensure information sharing between groups.	Ongoing

KEY DISCUSSION POINTS:

KEY POINTS
During the Thursday, May 18, 2023 Recreation & Land Use TWG, the TWG received an update from Chelan PUD on the Recreation materials (available on the Rock Island Relicensing website) and the bulk of the meeting focused on the Draft Recreation Use & Needs Study Plan Outline. Angela Whelpley (Kleinschmidt Associates) provided an overview of the Draft Recreation Use & Needs Study Plan Outline and TWG participants asked clarifying questions and provided feedback on the draft study outline.
The next Recreation & Land Use TWG meeting will be Thursday, July 20th. The TWG will discuss the draft Recreation Use and Needs Study Plan.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
None

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-05-18 Recreation & Land Use TWG Agenda
Agenda	Study Report	RI Recreation Inventory Report - FINAL
Minutes	Presentation	2023-05-18 Recreation & Land Use TWG Facilitator Slides

ROCK ISLAND RELICENSING
RECREATION & LAND USE
AND
WILDLIFE & BOTANICAL
TECHNICAL WORKING GROUPS

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: August 17, 2023
TIME: 10:00 a.m. – 11:30 a.m. Pacific Standard Time (PST)
LOCATION: In person: Confluence Technology Center (CTC) 285 Technology Center Way Ste 102, Wenatchee, WA 98801.

Virtual: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Conference ID: 778 795 14#

MEETING PURPOSE:

- Review and discuss transition from early engagement to the formal relicensing process.
- Provide updates on study plans and information reviews.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Bridget Moran	N
American White Water	Thomas O'Keefe	N
Audubon Society	Mark Johnston	N
Beck Botanical Services	Katy Beck	N
Bureau of Indian Affairs (BIA)	Harold Peterson	Y
BIA	Rudy Peone	N
BIA	Steve Lewis	N

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Bureau of Land Management (BLM)	Curtis Bryan	N
BLM	Diane Priebe	N
BLM	Erik Ellis	N
BLM	Katherine Russell	N
BLM	Lisa Clark	N
BLM	Molly Boyter	N
Chelan Douglas Regional Port Authority (CDRPA)	Craig Larsen	N
CDRPA	Stacie De Mestre	N
Chelan County	Adam Pfleeger	N
Chelan County	Julie Sanderson	N
Chelan County PUD (Chelan PUD)	Ben Truscott	Y
Chelan PUD	Janel Ulrich	Y
Chelan PUD	Kate Taylor	N
Chelan PUD	Kelly Cordell	N
Chelan PUD	Laura Clark	Y
Chelan PUD	Matt Shales	Y
Chelan PUD	Ray Heit	N
Chelan PUD	Ryan Baker	N
Chelan PUD	Von Pope	Y
City of East Wenatchee	Curtis Lillquist	N
City of Rock Island	Brock Laughlin	N
City of Rock Island	Charity Duffy	Y
City of Rock Island	James Zumini	N
City of Wenatchee	Laura Gloria	N
Columbia River Inter-Tribal Fish Commission	Julie Carter	N
Complete the Loop	Mike Sorensen	N
Complete the Loop	Peter Burgoon	N
Confederated Tribes of the Colville Reservation (CTRC)	Richard Whitney	N
CTRC	Sam Rushing	N
Confederated Tribes of the Umatilla Indian Reservation	Joe Pitt	N
Eastmont Parks	Charles Brown	N
Eastmont Parks	Sally Brawley	N
Hurst Landing	Cal Schaffer	Y
Individual	John King	Y
Individual	Steve Hays	N

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kleinschmidt Associates (Kleinschmidt)	Angela Whelpley	Y
Kleinschmidt	Fatima Oswald	Y
Kleinschmidt	Jeff Deason	N
Kleinschmidt	Nathalie Denis	Y
Kearns and West (KW)	Angela Hessenius	N
KW	Jim Downing	Y
KW	Katy Kennedy	Y
KW	Kelsey Rugani	N
KW	Mary Beth Day	N
NW Council	Sara Mounts	N
NW Council	Stacy Horton	Y
US Bureau of Reclamation	Gina Hoff	N
US Fish & Wildlife Service (USFWS)	Emily Orling	N
USFWS	Jerrmaine Treadwell	Y
USFWS	Tara Callaway	N
WA Dept. of Ecology (Ecology)	Breean Zimmerman	Y
Ecology	Mark Peterschmidt	N
WA Dept. of Fish & Wildlife (WDFW)	Benjamin Blank	N
WDFW	Emily Jeffreys	N
WDFW	Patrick Verhey	Y
WDFW	Richard Finger	N
WDFW	Sgt. Mike Jewell	N
WA Dept. of Natural Resources (WADNR)	Cindy Preston	N
WADNR	James Huinker	N
WADNR	Jesse Miller	N
WA Native Plant Society	Susan Ballinger	N
WA-Parks	Andrew Fielding	N
WA-Parks	Brian Patnode	N
WA-Parks	Chelsea Harris	N
WA-Parks	Colleen Foster	Y
Wenatchee Row and Paddle Club	Eric Thorson	N
Yakama Nation (YN)	Keely Murdoch	N
YN	Leon Ganuelas	N
YN	Mark Nuetzmann	N
YN	Tom Iverson	N

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

KEY POINTS:

KEY POINTS
During the Thursday, August 17th Wildlife & Botanical and Recreation & Land Use TWG meeting, the TWG received an overview of the TWG process moving forward and the transition from early engagement to the formal FERC relicensing process. FERC will manage the formal relicensing process, including setting the schedule for meetings and the deadlines for submission of documents and comments. The FERC website and eLibrary will be the primary sources of information during formal relicensing. FERC will also post notifications of the scoping meetings in local newspapers for public awareness.
The TWGs received an update on studies and information reviews related to the issues and information needs previously identified.
Further Recreation & Land Use and Wildlife & Botanicals TWG meetings will be held as needed during the formal relicensing process.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Reach out to Matt Shales (matt.shales@chelanpud.org), Ben Truscott (ben.truscott@chelanpud.org), or Jim/Kearns & West (jdowning@kearnswest.com) if you have any input or questions on the TWG process.	Ongoing
TWG Members	Reach out to Matt/Ben/Chelan PUD if you are not on the Recreation & Land Use TWG or Wildlife & Botanical TWG calendar invitation and would like to be added.	Ongoing
Chelan PUD	Circulate final August 17th Recreation & Land Use and Wildlife & Botanical TWG meeting summary.	8/24/2023

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-08-17 Rec & LU- W& B TWG Agenda
Minutes	Presentation	2023-08-17 Rec & LU - W&B TWG Facilitator Slides
Minutes	Schedule	Rock Island Relicensing ILP 2024 Schedule

ROCK ISLAND RELICENSING
FISH & AQUATIC TWG

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: September 12, 2023
TIME: 9:00 a.m. – 10:00 a.m. Pacific Daylight Time (PDT)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Provide updates on related Chelan PUD efforts and current Fish & Aquatic TWG Studies.
- Prepare TWG members for the transition from early engagement to the formal relicensing process.
- Confirm next steps and action items.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
Audubon Society	Johnston, Mark	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Bureau of Indian Affairs (BIA)	Hatch, Keith	No
BIA	Lewis, Steve	No
BIA	Peterson, Harold	Yes
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1 (Chelan PUD)	Hopkins, Scott	Yes
Chelan PUD	Keller, Lance	Yes
Chelan PUD	Odell, Brian	No
Chelan PUD	Taylor, Kate	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan PUD	Towey, William	No
Chelan PUD	Truscott, Ben	Yes
Chelan PUD	Ulrich, Janel	Yes
Chelan PUD	Underwood, Alene	Yes
Chelan PUD	Vanney, Peter	No
Chelan PUD	Willard, Catherine	No
City of Rock Island	Laughlin, Brock	No
Columbia River Inter-Tribal Commission (CRITFC)	Barton, Diane	No
CRITFC	Carter, Julie	No
CRITFC	Miller, Donella	No
CRITFC	Parker, Blaine	No
CRITFC	Porter, Lauri	Yes
CRITFC	Skiles, Tom	No
Confederated Tribes and Bands of Yakama Nation (Yakama Nation)	Blodgett, David	No
Yakama Nation	Iverson, Tom	No
Yakama Nation	Lampman, Ralph	Yes
Yakama Nation	Murdoch, Keely	No
Yakama Nation	Rogers, Brandon	No
Confederated Tribes of the Colville Reservation (CTCR)	Baldwin, Casey	No
CTCR	McLellan, Jason	No
CTCR	Nine, Bret	No
CTCR	Rollins, Renata	Yes
CTCR	Truscott, Kirk	Yes
Confederated Tribes of the Umatilla Indian Reservation (CTUIR)	Hall, Brent	No
CTUIR	Huber, Audie	No
CTUIR	Jackson, Aaron	No
CTUIR	Merkle, Carl	No
Confluence Environmental Company	Doyle, Eric	No
Environmental Assessment Services	Paulsen, Matt	No
Four Peaks Environmental (Four Peaks)	Miller, Joe	No
Four Peaks	Mugunthan, Pradeep	Yes
Four Peaks	Nagel, Leah	No
Golder WSP	Grutter, Paul	No
Individual	Hays, Steve	No
Individual	Stuart, Derek	No
Kearns & West	Day, Mary Beth	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kearns & West	Downing, Jim	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Kennedy, Katy	No
Kearns & West	Rugani, Kelsey	Yes
Kleinschmidt Associates (Kleinschmidt)	Deason, Jeff	No
Kleinschmidt	Denis, Nathalie	Yes
Kleinschmidt	Keefe, MaryLouise	No
Kleinschmidt	Steimle, Kai	Yes
Kleinschmidt	Thompson, Audrey	No
National Oceanic & Atmospheric Administration (NOAA)	Carlon, Scott	Yes
NOAA	Yeager, Justin	No
Northwest Power and Conservation Council (NWPCC)	Horton, Stacy	No
NWPCC	Mounts, Sara	No
U.S. Bureau of Reclamation (USBOR)	Archuleta, Shannon	No
USBOR	Hoff, Gina	No
U.S. Fish and Wildlife Service (USFWS)	Callaway, Tara	No
USFWS	Gale, William	Yes
USFWS	Kokos, Sonja	No
USFWS	Muir, Kenneth	No
USFWS	Nelle, R.D.	Yes
USFWS	Romine, Jason	No
USFWS	Treadwell, Jerrmaine	Yes
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
Washington State Department of Ecology (Ecology)	Bugica, Kalman	No
Ecology	Oreiro, Tyson	No
Ecology	Peterschmidt, Mark	Yes
Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife (WDFW)	Blank, Benjamin	No
WDFW	Burgess, Dave	No
WDFW	Heironimus, Laura	Yes
WDFW	Jackson, Chad	No
WDFW	Murdoch, Andrew	No
WDFW	Verhey, Patrick	No
Washington State Dept of Natural Resources (WADNR)	Huinker, James	Yes
WADNR	Preston, Cindy	Yes
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from September 12th Fish & Aquatic TWG meeting.	9/19/23
TWG Members	Subscribe to the FERC eLibrary to be notified when comments or documents are filed by visiting https://ferconline.ferc.gov/ and clicking "eSubscription." The FERC Project docket number is P-943.	Ongoing
TWG Members	Review and provide comments via SmartComment on the Macrophytes Study Report and Water Quality Study Report.	October/November 2023

KEY DISCUSSION POINTS:

KEY POINTS
• During the Tuesday, September 12 Fish & Aquatic TWG meeting, TWG members received an update on the transition from Early Engagement to formal relicensing, which will begin in December 2023 when Chelan PUD files the Notice of Intent (NOI) to seek a new license and submits the Pre-Application Document (PAD) to FERC. This presentation covered how the formal relicensing process differs from Early Engagement (Early Engagement is a voluntary, informal process initiated and managed by Chelan PUD, while the formal relicensing process will be managed by FERC). • The TWG members also reviewed how to subscribe to the FERC eLibrary to receive notifications when comments or documents are filed and the milestones and key dates in the Integrated Licensing Process (ILP), including a detailed look at the anticipated 2024 schedule and the role of TWGs moving forward.
• The TWG members also discussed Fish & Aquatic study and evaluation updates, including a recap of the studies that were completed or remain ongoing at the end of Early Engagement. There are two additional studies that will be completed and sent to the TWG members for SmartComment review in Fall 2023, the Water Quality Monitoring Study and the Macrophytes Study (the Macrophytes and Water Quality Subteams met to discuss the initial results of these studies following this meeting).

KEY POINTS
• Two studies (the Bull Trout and Resident Fish Stranding and Trapping Study and the Larval Pacific Lamprey Varial Zone Study) will not be completed in Early Engagement. Chelan PUD intends to submit study plans for both studies to FERC in the Proposed Study Plan as part of the formal relicensing process. • The TWG members also heard an update from Scott Hopkins, Chelan PUD, on the Piscivorous Bird Predation Summary. TWG members were interested in seeing the Pacific Lamprey and White Sturgeon PIT tag recovery data, which can be found on PTAGIS (Site Code is: RISFWC - Rock Island Forebay Waterbird Colony).

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-09-12 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-09-12 Fish & Aquatics TWG Facilitator Slides
Minutes	Schedule	Rock Island Relicensing ILP 2024 Schedule

ROCK ISLAND RELICENSING
MACROPHYTES & WATER QUALITY SUBTEAM

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: September 12, 2023
TIME: 10:15 a.m. – 11:15 a.m. Pacific Daylight Time (PDT)
LOCATION: Confluence Technology Center
285 Technology Center Way, Wenatchee, WA

MEETING PURPOSE:

- Review and discuss the Water Quality Monitoring Study results.
- Review and discuss the Macrophytes Study results.
- Confirm next steps and action items.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Bureau of Indian Affairs	Lewis, Steve	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1 (Chelan PUD)	Taylor, Kate	Yes
Chelan PUD	Truscott, Ben	Yes
Chelan PUD	Ulrich, Janel	Yes
Chelan PUD	Underwood, Alene	Yes
Columbia River Inter-Tribal Commission	Skiles, Tom	No
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely	No
Confederated Tribes of the Colville Reservation (CTCR)	Rollins, Renata	Yes
CTCR	Truscott, Kirk	No
Environmental Assessment Services (EAS)	Elias, Becky	Yes
EAS	Paulsen, Matt	No
Kearns & West	Hessenius, Angela	Yes
Kearns & West	Rugani, Kelsey	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kleinschmidt Associates (Kleinschmidt)	Denis, Nathalie	Yes
Kleinschmidt	Steimle, Kai	Yes
Kleinschmidt	Thompson, Audrey	No
U.S. Bureau of Reclamation	Hoff, Gina	No
U.S. Fish and Wildlife Service (USFWS)	Nelle, R.D.	Yes
USFWS	Treadwell, Jerrmaine	Yes
Washington State Department of Ecology (Ecology)	Glisson, Wes	Yes
Ecology	Zimmerman, Breean	Yes
Washington State Department of Fish and Wildlife	Verhey, Patrick	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from September 12th Fish & Aquatic TWG meeting.	9/19/23
TWG Members	Review and provide comments via SmartComment on the Macrophytes Study Report and Water Quality Study Report.	October/November 2023
Chelan PUD	Provide email update to Subteam members if anticipated timeline for SmartComment review period for the Macrophytes Study Report and Water Quality Study Report changes significantly.	October/November 2023

KEY DISCUSSION POINTS:

KEY POINTS
The Water Quality Subteam met to review and discuss the preliminary results of the Water Quality Monitoring Study. Pradeep Muganthan of Four Peaks Environmental, reviewed the summary results and key takeaways from the study. Discussion focused on clarifying questions and considerations for the project team as they move forward in finalizing the study report. Chelan PUD anticipates sharing the draft study report for review and comments via SmartComment for a one-week period beginning on October 31, 2023.
The Macrophytes Subteam met to review and discuss the preliminary results of the Macrophytes Study. Becky Elias of Environmental Assessment Services (EAS) reviewed the summary results and key takeaways from the study. Discussion focused on clarifying questions and considerations for the project team as they move forward in finalizing the study report. Chelan PUD anticipates sharing the

KEY POINTS
draft study report for review and comments via SmartComment for a one-week period beginning on October 26, 2023.

PARKING LOT ITEMS:

NEW PARKING LOT ITEM
N/A

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-09-12 Fish & Aquatic TWG Agenda
Minutes	Presentation	2023-09-12 Water Quality-Macrophytes Subteam TWG Facilitator Slides

ROCK ISLAND RELICENSING
2023 Q3-Q4 MANAGERS MEETING

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

DATE: September 19, 2023
TIME: 10:00 – 11:00 a.m. Pacific Daylight Time (PDT)
LOCATION: Click here to join the meeting or Call-in Dial: 253-999-5697 Enter Meeting ID: 564 808 604#

MEETING PURPOSE:

- Review and discuss transition from Early Engagement to formal relicensing process.
- Recap Early Engagement and provide updates on the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use Technical Working Groups.
- Confirm next steps.

PARTICIPANTS:

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
American Rivers	Moran, Bridget	No
American Whitewater	O'Keefe, Thomas	No
Audubon Society	Johnston, Mark	No
Beck Botanical Services	Beck, Katy	No
Blue Leaf	Robichaud, Dave	No
Blue Leaf	Wright, Corey	No
Bureau of Indian Affairs (BIA)	Hatch, Keith	No
BIA	Lewis, Steve	No
BIA	Mercier, Bryan	No
BIA	Peone, Rudy	No
BIA	Peterson, Harold	No
Cascade Fisheries	Lundgren, Jason	No
Chelan County	Pfleeger, Adam	No
Chelan County	Sanderson, Julie	No
Chelan County Public Utility District No. 1 (Chelan PUD)	Clark, Laura	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Chelan PUD	Cordell, Kelly	Yes
Chelan PUD	Hopkins, Scott	Yes
Chelan PUD	Keller, Lance	Yes
Chelan PUD	Pope, Von	Yes
Chelan PUD	Shales, Matt	Yes
Chelan PUD	Taylor, Kate	Yes
Chelan PUD	Towey, William	Yes
Chelan PUD	Truscott, Ben	Yes
Chelan PUD	Ulrich, Janel	Yes
Chelan PUD	Underwood, Alene	Yes
Chelan PUD	Baker, Ryan	No
Chelan PUD	Heit, Ray	No
Chelan PUD	Odell, Brian	No
Chelan PUD	Vanney, Peter	No
Chelan PUD	Willard, Catherine	No
Chelan Douglas Regional Port Authority	De Mestre, Stacie	No
Chelan Douglas Regional Port Authority	Larsen, Craig	No
City of East Wenatchee	Lillquist, Curtis	No
City of Rock Island	Duffy, Charity	No
City of Rock Island	Laughlin, Brock	No
City of Rock Island	Zumini, James	No
City of Wenatchee	Gloria, Laura	No
Columbia River Inter-Tribal Fish Commission (CRITFC)	Barton, Diane	No
CRITFC	Carter, Julie	No
CRITFC	Miller, Donella	No
CRITFC	Parker, Blaine	No
CRITFC	Porter, Lauri	No
CRITFC	Skiles, Tom	No
Complete the Loop Coalition	Burgoon, Peter	No
Complete the Loop Coalition	Sorensen, Mike	No
Confederated Tribes and Bands of Yakama Nation (Yakama Nation)	Murdoch, Keely	Yes
Yakama Nation	Barney, Casey	No
Yakama Nation	Blodgett, David	No
Yakama Nation	Ganuelas, Leon	No
Yakama Nation	Iverson, Tom	No
Yakama Nation	Lally, Jessica	No
Yakama Nation	Lampman, Ralph	No
Yakama Nation	Nuetzmann, Mark	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Yakama Nation	Oliver, Noah	No
Yakama Nation	Rigdon, Phil	No
Yakama Nation	Rogers, Brandon	No
Yakama Nation	Valdez, Kate	No
Confederated Tribes of the Colville Reservation (CTCR)	Rollins, Renata	Yes
CTCR	Baldwin, Casey	No
CTCR	Cook, Jacqueline	No
CTCR	Davis, John	No
CTCR	Desautel, Cody	No
CTCR	McLellan, Jason	No
CTCR	Miller, Crystal	No
CTCR	Moura, Guy	No
CTCR	Nine, Bret	No
CTCR	Rushing, Sam	No
CTCR	Truscott, Kirk	No
CTCR	Whitney, Richard	No
Confederated Tribes of the Umatilla Indian Reservation (CTUIR)	Hall, Brent	No
CTUIR	Huber, Audie	No
CTUIR	Jackson, Aaron	No
CTUIR	Merkle, Carl	No
CTUIR	Pitt, Joe	No
Confluence Environmental Company	Doyle, Eric	No
Department of Archaeology and Historic Preservation (DAHP)	Borth, Holly	No
DAHP	Brooks, Allyson	No
DAHP	Houser, Michael	No
DAHP	Whitlam, Rob	No
Eastmont Metropolitan Parks and Recreation	Brawley, Sally	No
Eastmont Metropolitan Parks and Recreation	Brown, Charles	No
Environmental Assessment Services	Paulsen, Matt	No
Four Peaks Environmental (Four Peaks)	Miller, Joe	Yes
Four Peaks	Mugunthan, Pradeep	Yes
Four Peaks	Nagel, Leah	No
Golder WSP	Grutter, Paul	No
Hurst Landing Estates Homeowners	Schaffer, Cal	Yes
Individual	King, John	Yes
Individual	Hays, Steve	No
Individual	Stuart, Derek	No
Kearns & West	Downing, Jim	Yes
Kearns & West	Hessenius, Angela	Yes

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Kearns & West	Rugani, Kelsey	Yes
Kearns & West	Day, Mary Beth	No
Kearns & West	Kennedy, Katy	No
Kleinschmidt Associates (Kleinschmidt)	Deason, Jeff	Yes
Kleinschmidt	Denis, Nathalie	Yes
Kleinschmidt	Oswald, Fatima	Yes
Kleinschmidt	Whelpley, Angela	Yes
Kleinschmidt	Keefe, MaryLouise	No
Kleinschmidt	Steimle, Kai	No
Kleinschmidt	Thompson, Audrey	No
National Oceanic & Atmospheric Administration (NOAA)	Carlon, Scott	No
NOAA	Graves, Ritchie	No
NOAA	Yeager, Justin	No
National Park Service	Rosebrough, Susan	No
Northwest Power and Conservation Council (NWPCC)	Horton, Stacy	Yes
NWPCC	Mounts, Sara	Yes
U.S. Bureau of Land Management (BLM)	Bailey, Richard	No
BLM	Boyter, Molly	No
BLM	Bryan, Curtis	No
BLM	Clark, Linda	No
BLM	Clark, Lisa	No
BLM	Ellis, Erik	No
BLM	Pindel, Kurt	No
BLM	Priebe, Diane	No
BLM	Russell, Katherine	No
U.S. Bureau of Reclamation (USBOR)	Archuleta, Shannon	No
USBOR	Hoff, Gina	No
U.S. Fish and Wildlife Service (USFWS)	Nelle, R.D.	Yes
USFWS	Romine, Jason	Yes
USFWS	Treadwell, Jerrmaine	Yes
USFWS	Callaway, Tara	No
USFWS	Gale, William	No
USFWS	Kokos, Sonja	No
USFWS	McDowell, Tom	No
USFWS	Muir, Kenneth	No
USFWS	Orling, Emily	No
USFWS	Thompson, Brad	No
Upper Columbia Salmon Recovery Board	Bowerman, Tracy	No
Washington Native Plant Society	Ballinger, Susan	No

AGENCY/ORGANIZATION	PARTICIPANT	ATTENDANCE
Washington State Department of Ecology (Ecology)	Bugica, Kalman	Yes
Ecology	Oreiro, Tyson	No
Ecology	Park, Sage	No
Ecology	Peterschmidt, Mark	No
Ecology	Roberts, Damon	No
Ecology	Zimmerman, Breean	No
Washington State Department of Fish and Wildlife (WDFW)	Murdoch, Andrew	Yes
WDFW	Verhey, Patrick	Yes
WDFW	Blank, Benjamin	No
WDFW	Burgess, Dave	No
WDFW	Finger, Richard	No
WDFW	Garrity, Michael	No
WDFW	Heironimus, Laura	No
WDFW	Hoenes, Brock	No
WDFW	Jackson, Chad	No
WDFW	Jeffreys, Emily	No
WDFW	Jewell, Sgt. Mike	No
Washington State Dept of Natural Resources (WADNR)	Huinker, James	No
WADNR	Miller, Jesse	No
WADNR	Preston, Cindy	No
Washington State Parks	Foster, Colleen	Yes
Washington State Parks	Bell, Josh	No
Washington State Parks	Fielding, Andrew	No
Washington State Parks	Harris, Chelsea	No
Washington State Parks	Herzog, Peter	No
Washington State Parks	Patnode, Brian	No
Washington State Parks	Sternback, Mike	No
Wenatchee Row and Paddle Club	Thorson, Eric	No

MEETING SUMMARY:

Please see the agenda for meeting items discussed.

ACTION ITEMS:

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
Chelan PUD	Circulate summary from September 19th TWG Manager's meeting.	9/26/23

RESPONSIBLE PERSON	ACTION ITEM	DUE DATE
TWG Members	Subscribe to the FERC eLibrary to be notified when comments or documents are filed by visiting https://ferconline.ferc.gov/ and clicking "eSubscription." The FERC Project docket number is: P-943.	Ongoing
TWG Members	Reach out to Janel Ulrich (janel.ulrich@chelanpud.org) or Kelsey Rugani (krugani@kearnswest.com) with any questions about the formal relicensing process.	Ongoing

KEY DISCUSSION ITEMS:

KEY DISCUSSION ITEMS
During the Tuesday, September 19 TWG Manager's Meeting, TWG members received an update on the transition from Early Engagement to formal relicensing. This presentation covered how the formal relicensing process differs from Early Engagement, key milestones in the FERC Integrated Licensing Process (ILP) process, and the anticipated 2024 schedule.
Chelan PUD also provided a recap of the Rock Island Relicensing Early Engagement process, including the progress of the Fish & Aquatic, Wildlife & Botanical, and Recreation & Land Use TWGs, on studies, evaluations, and information reviews. Completed study reports will be appended to the Pre-Application Document (PAD) that Chelan PUD will file with FERC in December 2023.

DOCUMENTS:

SENT WITH	DOCUMENT TYPE	DOCUMENT TITLE
Agenda	Agenda	2023-09-19 TWG Managers Group Agenda
Minutes	Presentation	2023-09-19 TWG Managers Group Presentation
Minutes	Handout	Rock Island Relicensing ILP 2024 Schedule

B.2 LIST OF TECHNICAL WORKING GROUP ATTENDEES

Table of Attendees: General and Manager's Technical Working Groups

AFFILIATION	NAME	10/14/21	11/18/21	01/18/22	01/19/22	01/20/22	07/19/22	11/1/22	04/18/23	09/19/23
		STAKEHOLDER WORKSHOP	POST-WORKSHOP	KICK-OFF (1/3)	KICK-OFF (2/3)	KICK-OFF (3/3)	MANAGERS	MANAGERS	MANAGERS	MANAGERS
American Rivers	Bridget Moran	X		X	X	X				
American Whitewater	Thomas O'Keefe				X	X				
Attorney General - WA	Lauren Kirigin			X						
Audubon Society	Bruce McCammon	X	X							
Audubon Society	Mark Johnston	X								
Blue Leaf	Corey Wright			X	X	X	X			
Bureau of Indian Affairs	Bryan Mercier					X				
Bureau of Indian Affairs	Harold Peterson									
Bureau of Indian Affairs	Jennifer Frozena	X								
Bureau of Indian Affairs	Keith Hatch		X							
Bureau of Indian Affairs	Rudy Peone					X				
Bureau of Land Management	Curtis Bryan	X		X	X	X			X	
Bureau of Land Management	Diane Priebe	X	X							
Bureau of Land Management	Erica Taecker	X								
Bureau of Land Management	Erik Ellis			X						
Bureau of Land Management	Richard Bailey	X	X	X	X	X	X	X		
CAFÉ	Laura Rivera					X				
Cascade Fisheries	Jason Lundgren	X			X	X				
Chelan-Douglas Land Trust	Hanne Beener	X								
Chelan Douglas Regional Port Authority	Mestre Stacie De	X	X							
Chelan PUD	Alene Underwood						X	X		X
Chelan PUD	Ben Truscott						X	X	X	
Chelan PUD	Brian Odell				X	X		X		
Chelan PUD	Catherine Willard			X	X	X				
Chelan PUD	Cody Gillin			X	X	X				
Chelan PUD	Craig Gyselinck	X								
Chelan PUD	Janel Ulrich			X	X	X	X	X	X	
Chelan PUD	Jeff Osborn					X				
Chelan PUD	Jennifer Burns			X						

AFFILIATION	NAME	10/14/21	11/18/21	01/18/22	01/19/22	01/20/22	07/19/22	11/1/22	04/18/23	09/19/23
		STAKEHOLDER WORKSHOP	POST-WORKSHOP	KICK-OFF (1/3)	KICK-OFF (2/3)	KICK-OFF (3/3)	MANAGERS	MANAGERS	MANAGERS	MANAGERS
Chelan PUD	Justin Erickson						X		X	
Chelan PUD	Kate Taylor			X	X		X	X	X	X
Chelan PUD	Kelly Cordell									X
Chelan PUD	Lance Keller			X	X	X	X	X	X	X
Chelan PUD	Laura Clark								X	X
Chelan PUD	Marcie Clement			X	X	X	X	X		
Chelan PUD	Matt Shales			X	X	X	X	X	X	X
Chelan PUD	Michelle Smith					X	X			
Chelan PUD	Ryan Baker			X	X	X	X		X	
Chelan PUD	Scott Hopkins			X			X	X	X	X
Chelan PUD	Von Pope			X	X		X	X	X	X
Chelan PUD	William Towey			X	X		X	X	X	
City of East Wenatchee	Curtis Lillquist	X	X							
City of Rock Island	James Zumini			X						
City of Rock Island	Randy Agnew					X				
Columbia River Inter-Tribal Fish Commission	Julie Carter	X								
Confederated Tribes of the Colville Reservation	Charles Brushwood	X	X							
Confederated Tribes of the Colville Reservation	Cody Desautel	X								
Confederated Tribes of the Colville Reservation	Crystal Miller						X			
Confederated Tribes of the Colville Reservation	Douglas Marconi			X	X					
Confederated Tribes of the Colville Reservation	Guy Moura			X	X	X		X	X	
Confederated Tribes of the Colville Reservation	Jason McLellan			X		X				
Confederated Tribes of the Colville Reservation	Kirk Truscott	X		X	X		X	X		

AFFILIATION	NAME	10/14/21	11/18/21	01/18/22	01/19/22	01/20/22	07/19/22	11/1/22	04/18/23	09/19/23
		STAKEHOLDER WORKSHOP	POST-WORKSHOP	KICK-OFF (1/3)	KICK-OFF (2/3)	KICK-OFF (3/3)	MANAGERS	MANAGERS	MANAGERS	MANAGERS
Confederated Tribes of the Colville Reservation	Renata Rollins								X	X
Confederated Tribes of the Colville Reservation	Rodney Cawston			X		X				
Confederated Tribes of the Umatilla Indian Reservation	Carl Merkle					X		X	X	
Confederated Tribes and Bands of the Yakama Nation	Brandon Rogers			X	X	X				
Confederated Tribes and Bands of the Yakama Nation	David Blodgett				X	X				
Confederated Tribes and Bands of the Yakama Nation	Elaine Harvey	X		X	X		X			
Confederated Tribes and Bands of the Yakama Nation	Jessica Lally				X					
Confederated Tribes and Bands of the Yakama Nation	Keely Murdoch	X		X	X		X	X	X	X
Confederated Tribes and Bands of the Yakama Nation	Noah Oliver			X						
Confederated Tribes and Bands of the Yakama Nation	Ralph Lampman	X		X				X	X	
Confederated Tribes and Bands of the Yakama Nation	Tom Iverson		X		X	X				
Department of Archaeology and Historic Preservation	Holly Borth	X								
Department of Archaeology and Historic Preservation	Michael Houser	X								
Department of Archaeology and Historic Preservation	Rob Whitlam	X		X		X		X		
Eastmont Metro Parks and Rec	Charles Brown						X	X		
Four Peaks Environmental Science & Data Solutions	Joe Miller						X		X	X

AFFILIATION	NAME	10/14/21	11/18/21	01/18/22	01/19/22	01/20/22	07/19/22	11/1/22	04/18/23	09/19/23
		STAKEHOLDER WORKSHOP	POST-WORKSHOP	KICK-OFF (1/3)	KICK-OFF (2/3)	KICK-OFF (3/3)	MANAGERS	MANAGERS	MANAGERS	MANAGERS
Four Peaks Environmental Science & Data Solutions	Joshua Murauskas							X	X	
Four Peaks Environmental Science & Data Solutions	Pradeep Mugunthan			X		X	X	X	X	X
Greater Wenatchee Irrigation District	Craig Gyselink			X						
Hurst Landing Estates Homeowners	Cal Schaffer									X
Individual	John King	X		X	X	X	X	X		X
Individual	Steve Hays			X	X	X				
Kearns and West	Angela Hessenius						X	X	X	X
Kearns and West	Jim Downing						X			X
Kearns and West	Katy Kennedy						X	X		
Kearns and West	Kelsey Rugani			X	X	X	X	X	X	X
Kearns and West	Mary Beth Day			X	X	X			X	
Kleinschmidt Associates	Angela Whelpley						X		X	X
Kleinschmidt Associates	Audrey Thompson			X			X		X	
Kleinschmidt Associates	Emily Waters			X	X	X				
Kleinschmidt Associates	Fatima Oswald						X	X	X	X
Kleinschmidt Associates	Jeff Deason	X		X	X		X		X	X
Kleinschmidt Associates	Kai Steimle			X	X	X	X			
Kleinschmidt Associates	Kelly Larimer			X	X	X				
Kleinschmidt Associates	MaryLouise Keefe			X	X	X				
Kleinschmidt Associates	Matthew Harper			X		X				
Kleinschmidt Associates	Nathalie Denis			X	X	X	X	X	X	X
Kleinschmidt Associates	Nuria Holmes	X		X	X	X				
National Oceanic and Atmospheric Administration	Justin Yeager							X		
National Oceanic and Atmospheric Administration	Ritchie Graves						X	X	X	
National Oceanic and Atmospheric Administration	Scott Carlon	X	X					X		

AFFILIATION	NAME	10/14/21	11/18/21	01/18/22	01/19/22	01/20/22	07/19/22	11/1/22	04/18/23	09/19/23
		STAKEHOLDER WORKSHOP	POST-WORKSHOP	KICK-OFF (1/3)	KICK-OFF (2/3)	KICK-OFF (3/3)	MANAGERS	MANAGERS	MANAGERS	MANAGERS
Northwest Power and Conservation Council	Sara Mounts									X
Northwest Power and Conservation Council	Stacy Horton							X		X
National Park Service	Stephen Bowes							X		
TREAD	Mat Lyons			X						
Trout Unlimited	Lisa Pelly	X	X							
Upper Columbia Salmon Recovery Board	Tracy Bowerman	X		X		X				
United States Bureau of Reclamation	Gina Hoff			X	X	X		X		
United States Fish and Wildlife Service	Jason Romine									X
United States Fish and Wildlife Service	Jerrmaine Treadwell									X
United States Fish and Wildlife Service	Judy Neibauer		X					X		
United States Fish and Wildlife Service	R.D. Nelle	X		X	X	X	X	X		X
United States Fish and Wildlife Service	Randi Riggs	X								
United States Fish and Wildlife Service	Sonja Kokos				X			X		
United States Fish and Wildlife Service	William Gale		X	X	X	X		X	X	
United States Fish and Wildlife Service/BIA	Steve Lewis	X	X	X	X	X				
Washington Department of Ecology	Breean Zimmerman	X	X	X			X		X	
Washington Department of Ecology	Damon Roberts						X		X	
Washington Department of Ecology	Jim Pacheco	X								
Washington Department of Ecology	Kalman Bugica					X				X
Washington Department of Ecology	Mark Peterschmidt				X	X	X	X		
Washington Department of Ecology	Sage Park						X			
Washington Department of Natural Resources	Cindy Preston			X	X	X		X		
Washington Department of Natural Resources	James Huinker			X						
Washington Native Plant Society	Susan Ballinger	X								
Washington Department of Fish and Wildlife	Amanda Barg	X	X	X	X					

AFFILIATION	NAME	10/14/21	11/18/21	01/18/22	01/19/22	01/20/22	07/19/22	11/1/22	04/18/23	09/19/23
		STAKEHOLDER WORKSHOP	POST-WORKSHOP	KICK-OFF (1/3)	KICK-OFF (2/3)	KICK-OFF (3/3)	MANAGERS	MANAGERS	MANAGERS	MANAGERS
Washington Department of Fish and Wildlife	Andrew Murdoch	X	X				X			X
Washington Department of Fish and Wildlife	Benjamin Blank	X	X	X	X	X		X		
Washington Department of Fish and Wildlife	Brandon Chasco									X
Washington Department of Fish and Wildlife	Brock Hoenes	X	X				X			
Washington Department of Fish and Wildlife	Carmen Andonaegui	X	X	X		X				
Washington Department of Fish and Wildlife	Chad Jackson	X	X		X	X		X		
Washington Department of Fish and Wildlife	Dave Burgess			X	X	X				
Washington Department of Fish and Wildlife	Graham Simon			X	X					
Washington Department of Fish and Wildlife	Laura Heironimus	X			X	X		X	X	
Washington Department of Fish and Wildlife	Michael Garrity	X					X	X		
Washington Department of Fish and Wildlife	Mike Tonseth	X		X						
Washington Department of Fish and Wildlife	Patrick Verhey	X		X	X	X	X		X	X
Washington Department of Fish and Wildlife	Richard Finger	X	X	X		X				
Wenatchee River Institute	Carolyn Griffin-Bugert					X				
Wenatchee Row and Paddle Club	Eric Thorson			X	X	X		X		
Washington State Parks	Andrew Fielding			X						
Washington State Parks	Brian Patnode	X		X						

AFFILIATION	NAME	10/14/21	11/18/21	01/18/22	01/19/22	01/20/22	07/19/22	11/1/22	04/18/23	09/19/23
		STAKEHOLDER WORKSHOP	POST-WORKSHOP	KICK-OFF (1/3)	KICK-OFF (2/3)	KICK-OFF (3/3)	MANAGERS	MANAGERS	MANAGERS	MANAGERS
Washington State Parks	Chelsea Harris			X	X	X	X	X	X	
Washington State Parks	Colleen Foster	X	X	X	X	X	X	X	X	X
Washington State Parks	Jon Crimmins						X			
Washington State Parks	Josh Bell						X			
Washington State Parks	Peter Herzog						X			
WSP Golder	Paul Grutter						X			

Table of Attendees: Fish and Aquatic Technical Working Group

AFFILIATION	NAME	03/08/22	04/12/22	05/10/22	06/14/22	07/12/22	08/09/22	09/13/22	10/11/22	10/11/22	10/11/22	11/08/22	12/13/22	12/13/22	12/19/23	01/10/23	02/14/23	02/14/23	03/14/23	04/11/23	04/11/23	04/11/23	05/09/23	09/12/23	09/12/23	09/12/23
		FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	PACIFIC LAMPREY SUBTEAM	BULL TROUT & RESIDENT FISH SUBTEAM	FISH & AQUATIC	FISH & AQUATIC	MACROPHYTES SUBTEAM	PACIFIC LAMPREY SUBTEAM	FISH & AQUATIC	BULL TROUT & RESIDENT FISH SUBTEAM	PACIFIC LAMPREY SUBTEAM	MACROPHYTES SUBTEAM	FISH & AQUATIC	WATER QUALITY SUBTEAM	WHITE STURGEON SUBTEAM	PACIFIC LAMPREY SUBTEAM	FISH & AQUATIC	WATER QUALITY SUBTEAM	MACROPHYTES SUBTEAM
American Rivers	Bridget Moran		X																		X					
Audubon Society	Mark Johnston			X	X																					
Blue Leaf	Corey Wright	X	X	X			X					X								X		X				
Bureau of Indian Affairs	Harold Peterson																							X	X	
Bureau of Indian Affairs	Steve Lewis							X	X		X	X	X		X					X	X		X			
Cascade Fisheries	Jason Lundgren	X																								
Chelan PUD	Alene Underwood		X	X	X	X	X	X	X				X			X								X	X	
Chelan PUD	Ben Truscott		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			X		X	X	X	X
Chelan PUD	Brian Odell	X	X	X	X	X	X	X					X			X										
Chelan PUD	Catherine Willard		X																							
Chelan PUD	Cody Gillin							X																		
Chelan PUD	Janel Ulrich			X		X	X	X	X			X	X							X				X	X	
Chelan PUD	Kate Taylor			X	X	X	X						X	X		X	X		X	X	X	X		X	X	
Chelan PUD	Lance Keller		X	X	X		X		X			X	X			X				X		X		X		
Chelan PUD	Laura Clark																			X	X	X	X			
Chelan PUD	Marcie Clement	X	X	X	X	X	X	X	X			X	X	X		X			X							
Chelan PUD	Peter Vanney																				X					
Chelan PUD	Scott Hopkins	X	X	X	X		X		X			X	X		X	X	X	X		X			X	X		
Chelan PUD	William Towey		X	X	X	X	X	X	X		X	X	X			X	X	X				X	X			
Confluence Environmental	Eric Doyle			X																						
Columbia River Inter-Tribal Fish Commission	Blaine Parker					X	X	X	X		X															
Columbia River Inter-Tribal Fish Commission	Diane Barton								X																	
Columbia River Inter-Tribal Fish Commission	Julie Carter			X				X	X																	
Columbia River Inter-Tribal Fish Commission	Lauri Porter			X		X	X		X	X								X					X	X		
Columbia River Inter-Tribal Fish Commission	Tom Skiles			X	X		X	X	X			X	X	X									X	X		
Confederated Tribes of the Colville Reservation	Casey Baldwin	X																								
Confederated Tribes of the Colville Reservation	Douglas Marconi			X				X																		
Confederated Tribes of the Colville Reservation	Jason McLellan		X	X	X		X	X	X		X					X	X			X		X				
Confederated Tribes of the Colville Reservation	Kirk Truscott		X	X	X	X	X	X				X	X			X		X						X		
Confederated Tribes of the Colville Reservation	Renata Rollins																							X		X

AFFILIATION	NAME	03/08/22	04/12/22	05/10/22	06/14/22	07/12/22	08/09/22	09/13/22	10/11/22	10/11/22	10/11/22	11/08/22	12/13/22	12/13/22	12/19/23	01/10/23	02/14/23	02/14/23	03/14/23	04/11/23	04/11/23	04/11/23	05/09/23	09/12/23	09/12/23	09/12/23
		FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	PACIFIC LAMPREY SUBTEAM	BULL TROUT & RESIDENT FISH SUBTEAM	FISH & AQUATIC	FISH & AQUATIC	MACROPHYTES SUBTEAM	PACIFIC LAMPREY SUBTEAM	FISH & AQUATIC	BULL TROUT & RESIDENT FISH SUBTEAM	PACIFIC LAMPREY SUBTEAM	MACROPHYTES SUBTEAM	FISH & AQUATIC	WATER QUALITY SUBTEAM	WHITE STURGEON SUBTEAM	PACIFIC LAMPREY SUBTEAM	FISH & AQUATIC	WATER QUALITY SUBTEAM	MACROPHYTES SUBTEAM
Confederated Tribes of the Umatilla Indian Reservation	Carl Merkle								X											X						
Confederated Tribes and Bands of the Yakama Nation	David Blodgett		X			X																				
Confederated Tribes and Bands of the Yakama Nation	Elaine Harvey		X	X	X	X		X																		
Confederated Tribes and Bands of the Yakama Nation	Keely Murdoch	X	X	X	X	X	X	X	X	X	X	X	X		X			X		X		X	X			
Confederated Tribes and Bands of the Yakama Nation	Ralph Lampman	X	X	X		X	X	X	X	X			X		X	X		X		X		X	X	X		
Confederated Tribes and Bands of the Yakama Nation	Russ Byington																X									
Confederated Tribes and Bands of the Yakama Nation	Todd Newsome																X									
Confederated Tribes and Bands of the Yakama Nation	Tom Iverson	X		X			X																			
Environmental Assessment Services	Becky Elias												X	X					X							X
Environmental Assessment Services	Matt Paulsen												X			X			X	X						
Four Peaks Environmental Science & Data Solutions	Joe Miller	X	X		X	X	X	X	X		X	X	X			X	X			X						
Four Peaks Environmental Science & Data Solutions	Joshua Murauskas						X	X	X			X	X		X	X	X	X					X			
Four Peaks Environmental Science & Data Solutions	Leah Nagel																				X				X	
Four Peaks Environmental Science & Data Solutions	Lucius Caldwell																X									
Four Peaks Environmental Science & Data Solutions	Pradeep Mugunthan		X	X	X	X	X	X	X			X								X	X			X	X	
Individual	Steve Hays	X	X																							
Kearns and West	Angela Hessenius			X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Kearns and West	Jim Downing			X																						
Kearns and West	Kelsey Rugani			X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Kleinschmidt Associates	Audrey Thompson		X	X		X	X	X	X			X	X		X	X	X	X		X		X				
Kleinschmidt Associates	Emily Waters			X	X																					
Kleinschmidt Associates	Jeff Deason					X	X	X	X			X		X		X				X						
Kleinschmidt Associates	Kai Steimle	X	X	X	X			X	X			X		X		X				X				X	X	X
Kleinschmidt Associates	MaryLouise Keefe	X	X		X		X	X																		
Kleinschmidt Associates	Nathalie Denis		X	X	X	X	X		X		X		X	X	X	X	X	X	X	X	X		X	X	X	X

AFFILIATION	NAME	03/08/22	04/12/22	05/10/22	06/14/22	07/12/22	08/09/22	09/13/22	10/11/22	10/11/22	10/11/22	11/08/22	12/13/22	12/13/22	12/19/23	01/10/23	02/14/23	02/14/23	03/14/23	04/11/23	04/11/23	04/11/23	05/09/23	09/12/23	09/12/23	09/12/23
		FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	FISH & AQUATIC	PACIFIC LAMPREY SUBTEAM	BULL TROUT & RESIDENT FISH SUBTEAM	FISH & AQUATIC	FISH & AQUATIC	MACROPHYTES SUBTEAM	PACIFIC LAMPREY SUBTEAM	FISH & AQUATIC	BULL TROUT & RESIDENT FISH SUBTEAM	PACIFIC LAMPREY SUBTEAM	MACROPHYTES SUBTEAM	FISH & AQUATIC	WATER QUALITY SUBTEAM	WHITE STURGEON SUBTEAM	PACIFIC LAMPREY SUBTEAM	FISH & AQUATIC	WATER QUALITY SUBTEAM	MACROPHYTES SUBTEAM
National Oceanic and Atmospheric Administration	Scott Carlon	X	X	X		X	X	X	X			X				X				X				X		
Northwest Hydraulic Consultants, Inc.	Derek Stuart																			X						
Northwest Power and Conservation Council	Sara Mounts	X	X	X	X		X	X	X			X	X							X						
Northwest Power and Conservation Council	Stacy Horton	X					X					X														
Upper Columbia Salmon Recovery Board	Tracy Bowerman	X	X			X	X	X	X																	
United States Bureau of Reclamation	Gina Hoff			X	X	X		X	X			X	X	X		X			X	X	X	X				
United States Fish and Wildlife Service	Jason Romine												X			X	X			X	X	X				
United States Fish and Wildlife Service	Jerrmaine Treadwell											X	X	X	X	X	X	X	X	X			X	X	X	X
United States Fish and Wildlife Service	Judy Neibauer			X	X			X	X				X			X	X	X		X	X					
United States Fish and Wildlife Service	R.D. Nelle	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X		X	X	X		X	X	X
United States Fish and Wildlife Service	Sonja Kokos	X	X	X	X			X																		
United States Fish and Wildlife Service	Steve Lewis	X																								
United States Fish and Wildlife Service	Tara Callaway															X										
United States Fish and Wildlife Service	William Gale	X	X	X		X	X	X	X		X	X	X			X				X				X		
Washington Department of Ecology	Breean Zimmerman		X	X	X			X	X			X	X			X				X	X			X	X	
Washington Department of Ecology	Kalman Bugica						X														X				X	
Washington Department of Ecology	Mark Peterschmidt		X		X	X		X				X												X		
Washington Department of Ecology	Wes Glisson																		X							X
Washington Department of Natural Resources	Cindy Preston		X	X		X		X								X								X		
Washington Department of Natural Resources	James Huinker	X	X	X		X	X	X				X				X				X						
Washington Department of Fish and Wildlife	Andrew Murdoch		X	X		X																				
Washington Department of Fish and Wildlife	Chad Jackson	X	X		X		X	X								X	X									
Washington Department of Fish and Wildlife	Dave Burgess	X	X			X		X	X		X	X					X									
Washington Department of Fish and Wildlife	Laura Heironimus	X	X	X		X	X	X	X	X					X	X		X		X		X	X	X		
Washington Department of Fish and Wildlife	Patrick Verhey		X	X	X	X	X	X	X			X	X	X		X	X	X	X	X	X	X				
WSP Golder	Paul Grutter		X																							

Table of Attendees: Wildlife and Botanical Technical Working Group

AFFILIATION	NAME	03/10/22	04/14/22	05/12/22	06/09/22	07/14/22	10/13/22	03/16/23	03/16/23	08/17/23
		WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	RTE PLANTS SUBTEAM	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL
Audubon Society	Bruce McCammon				X					
Audubon Society	Mark Johnston		X	X			X			
Beck Botanical Services	Katy Beck		X							
Bureau of Indian Affairs	Harold Peterson									X
Bureau of Indian Affairs	Rudy Peone		X							
Bureau of Land Management	Erik Ellis	X								
Bureau of Land Management	Linda Clark				X					
Bureau of Land Management	Lisa Clark				X					
Bureau of Land Management	Molly Boyter	X								
Chelan PUD	Ben Truscott		X		X	X	X	X	X	X
Chelan PUD	Cody Gillin						X			
Chelan PUD	Janel Ulrich			X	X		X		X	X
Chelan PUD	Kate Taylor		X	X		X		X	X	
Chelan PUD	Kelly Cordell	X	X	X		X	X			
Chelan PUD	Laura Clark									X
Chelan PUD	Von Pope		X	X	X	X	X	X	X	X
Confederated Tribes of the Colville Reservation	Sam Rushing	X								
Confederated Tribes and Bands of the Yakama Nation	David Blodgett	X								
Confederated Tribes and Bands of the Yakama Nation	Elaine Harvey	X	X	X	X	X				
Confederated Tribes and Bands of the Yakama Nation	Leon Ganuelas	X		X						
Confederated Tribes and Bands of the Yakama Nation	Mark Nuetzmann		X	X						

AFFILIATION	NAME	03/10/22	04/14/22	05/12/22	06/09/22	07/14/22	10/13/22	03/16/23	03/16/23	08/17/23
		WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL	RTE PLANTS SUBTEAM	WILDLIFE & BOTANICAL	WILDLIFE & BOTANICAL
Individual	Steve Hays		X							
Kearns and West	Ariella Dahlin		X	X	X					
Kearns and West	Jim Downing			X	X	X	X	X	X	X
Kearns and West	Katy Kennedy					X	X	X	X	X
Kearns and West	Kelsey Rugani		X							
Kearns and West	Mary Beth Day							X		
Kleinschmidt Associates	Emily Waters		X	X						
Kleinschmidt Associates	Fatima Oswald			X						
Kleinschmidt Associates	Nathalie Denis	X	X	X	X	X	X		X	X
Northwest Power and Conservation Council	Sara Mounts		X				X		X	
Northwest Power and Conservation Council	Stacy Horton		X	X	X					X
United States Fish and Wildlife Service	Emily Orling						X	X	X	
United States Fish and Wildlife Service	Jerrmaine Treadwell									X
United States Fish and Wildlife Service	Tara Callaway	X	X							
Washington Department of Natural Resources	Cindy Preston		X		X	X				
Washington Department of Natural Resources	James Huinker				X	X			X	
Washington Department of Natural Resources	Jesse Miller							X		
Washington Department of Fish and Wildlife	Patrick Verhey		X	X	X	X	X		X	X
Washington State Parks	Chelsea Harris								X	

Table of Attendees: Recreation and Land Use Technical Working Group

AFFILIATION	NAME	03/17/22	04/21/22	05/19/22	06/16/22	07/21/22	08/18/22	09/15/22	11/17/22	02/16/23	03/16/23	05/18/23	08/17/23
		Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use
American Rivers	Bridget Moran	X	X										
American Whitewater	Thomas O'Keefe	X	X										
Audubon Society	Bruce McCammon	X	X		X	X	X	X	X	X	X		
Bureau of Land Management	Katherine Russell			X			X						
Confederated Tribes and Bands of the Yakama Nation	Elaine Harvey		X	X		X	X						
Confederated Tribes and Bands of the Yakama Nation	Keely Murdoch		X						X				
Confederated Tribes and Bands of the Yakama Nation	Tom Iverson			X									
Chelan PUD	Ben Truscott				X								
Chelan PUD	Cody Gillin								X				
Chelan PUD	Janel Ulrich			X								X	X
Chelan PUD	Jeff Osborn								X				
Chelan PUD	Kate Taylor			X			X		X	X	X	X	
Chelan PUD	Laura Clark											X	X
Chelan PUD	Matt Shales	X	X	X	X	X	X	X	X	X	X	X	X
Chelan PUD	Ray Heit				X								
Chelan PUD	Ryan Baker	X	X	X		X							
Chelan PUD	Von Pope				X								
City of Rock Island	Brock Laughlin	X	X	X	X								

AFFILIATION	NAME	03/17/22	04/21/22	05/19/22	06/16/22	07/21/22	08/18/22	09/15/22	11/17/22	02/16/23	03/16/23	05/18/23	08/17/23
		Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use
City of Rock Island	Charity Duffy								X			X	X
City of Wenatchee	Laura Gloria				X								
Complete the Loop Coalition	Peter Burgoon				X								
Eastmont Metro Parks and Rec	Charles Brown		X	X		X		X	X	X			
Hurst Landing Estates Homeowners	Cal Schaffer											X	X
Individual	John King	X	X	X	X	X			X			X	X
Individual	Patrick Tracy				X								
Individual	Steve Hays		X										
Kearns and West	Angela Hessenius			X								X	
Kearns and West	Ariella Dahlin		X										
Kearns and West	Jim Downing										X	X	X
Kearns and West	Katy Kennedy					X	X	X	X	X	X		X
Kearns and West	Kelsey Rugani					X						X	
Kearns and West	Mary Beth Day		X	X	X	X	X	X	X	X	X	X	
Kleinschmidt Associates	Angela Whelpley		X	X		X	X	X	X	X	X	X	X
Kleinschmidt Associates	Emily Waters					X							
Kleinschmidt Associates	Fatima Oswald			X		X	X		X	X	X	X	X
Kleinschmidt Associates	Nathalie Denis			X		X	X		X		X		X
Kleinschmidt Associates/SWCA	Nuria Holmes	X		X									
United States Fish and Wildlife Service	Jerrmaine Treadwell									X			

AFFILIATION	NAME	03/17/22	04/21/22	05/19/22	06/16/22	07/21/22	08/18/22	09/15/22	11/17/22	02/16/23	03/16/23	05/18/23	08/17/23
		Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use	Recreation & Land Use
Washington Department of Ecology	Breean Zimmerman	X	X			X	X	X		X			X
Washington Department of Ecology	Mark Peterschmidt			X		X			X				
Washington Department of Natural Resource	Cindy Preston	X						X	X				
Washington Department of Fish and Wildlife	Patrick Verhey		X	X		X		X	X	X		X	X
Washington State Parks	Chelsea Harris	X	X	X			X	X	X	X			
Washington State Parks	Colleen Foster		X	X	X	X	X		X	X		X	X
Wenatchee Row and Paddle Club	Eric Thorson	X	X	X	X				X	X			

B.3 ENTITIES NOT PARTICIPATING IN EARLY ENGAGEMENT

The following entities, including Tribes, were extended invitations to partake in early engagement, through direct email or physical mail, but did not take part in early engagement:

- Alcoa
- Cascadia Conservation District
- Chelan-Douglas Health District
- Chelan County
- City of Chelan
- Columbia Valley Community Health
- Entiat Chamber
- Federal Energy Regulatory Commission
- Hand in Hand Immigration Services
- Initiative for Rural Innovation and Stewardship
- National Wild Turkey Federation
- Our Valley Our Future
- Puget Sound Energy
- Rail America
- Sustainable North Central Washington
- The Nature Conservancy
- The Trust for Public Land
- U.S. Army Corps of Engineers
- Washington State Legislature
- Wenatchee Chamber
- Wenatchee School District
- Wenatchee Sportsman's Association
- Wenatchee Valley Sports Council
- Washington State Department of Transportation
- Wenatchee Valley Community College

Tribes:

- Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
- Confederated Tribes of the Chehalis Reservation
- Cowlitz Indian Tribe
- Hoh Tribal Business Committee
- Jamestown S'Klallam Tribal Council
- Kalispel
- Lower Elwha Tribal Council
- Lummi Indian Business Council
- Makah Indian Tribal Council
- Muckleshoot Tribal Council
- Nisqually Indian Community Council
- Nooksack Indian Tribal Council
- Port Gamble S'Klallam Tribe
- Puyallup Tribal Council
- Quileute Tribal Council
- Quinault Indian Nation

- Samish Indian Nation
- Sauk-Suiattle Tribal Council
- Shoalwater Bay Tribal Council
- Skokomish Tribal Council
- Snoqualmie Tribal Organization
- Spokane Tribe of Indians
- Squaxin Island Tribal Council
- Stillaguamish Board of Directors
- Suquamish Tribal Council
- Swinomish Indian Tribal Community
- Tulalip Board of Directors
- Upper Skagit Tribal Council
- Wanapum Tribe

B.4 TECHNICAL WORKING GROUP GUIDELINES

TECHNICAL WORKING GROUP GUIDELINES

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

JANUARY 2022

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1.0 GUIDELINES PURPOSE

These Technical Working Group (TWG) Guidelines describe the structure and protocols for TWG work during the Rock Island Hydroelectric Project No. 943 (Rock Island Project or Project) relicensing process to ensure common understanding on the approach among all participants.

The Public Utility District No. 1 of Chelan County (Chelan PUD) will use the Federal Energy Regulatory Commission's (FERC) default Integrated Licensing Process (ILP) to relicense the Project. To enhance stakeholder engagement beyond the requirements of FERC's ILP, Chelan PUD is initiating TWGs and early, voluntary engagement to work closely with relicensing participants to identify and develop technical resource studies.

Over the course of early engagement and the formal relicensing process, the TWGs will have the following objectives:

- Share Project-related background information to inform the Pre-Application Document (PAD);
- Identify agency mandates and other relicensing participant goals;
- Develop a list of agreed-upon issues and associated studies;
- Review and provide input on study outlines and plans prior to execution of studies and review study results, as requested by Chelan PUD; and
- Assist in the development and review of resource management plans.

2.0 INTRODUCTION

Chelan PUD is the licensee, owner, and operator of the Rock Island Project. Rock Island Dam is located approximately 12 miles downstream of the city of Wenatchee, and 20 miles downstream of Rocky Reach Hydroelectric Project (FERC Project No. 2145) (Figure 2-1). The Project spans the Columbia River and includes lands in Chelan and Douglas counties. Presently, the Project has a total FERC-authorized generating capacity of 412.41 megawatts (MW), and a total installed nameplate capacity rated at 628.9 MW. Chelan PUD is authorized under the State of Washington's statutes as a non-profit municipal corporation, and functions as a customer-owned public cooperative energy district.

Chelan PUD's 40-year license from FERC to operate the Rock Island Project expires December 31, 2028. Under the requirements of the Federal Power Act (FPA), Chelan PUD must file its relicensing application with FERC by December 31, 2026. In addition, under the FPA and FERC's regulations, Chelan PUD must initiate the formal relicensing process between July 1 and December 31, 2023, by filing a Notice of Intent (NOI) to seek a new license for the Project, together with the PAD.

Relicensing Website

Prior to initiating the formal relicensing process, Chelan PUD is conducting early voluntary relicensing efforts designed to improve the formal relicensing process and give more time to study resources associated with the Project. The early relicensing activities consist of stakeholder outreach and TWG meetings to identify Project-related resource issues and develop formal study plans. For additional information on relicensing please see www.chelanpud.org/newlicense. To easily access that website, you may hold your phone's camera up to the quick response (QR) code above with your smart phone (you do not need to take a photo).

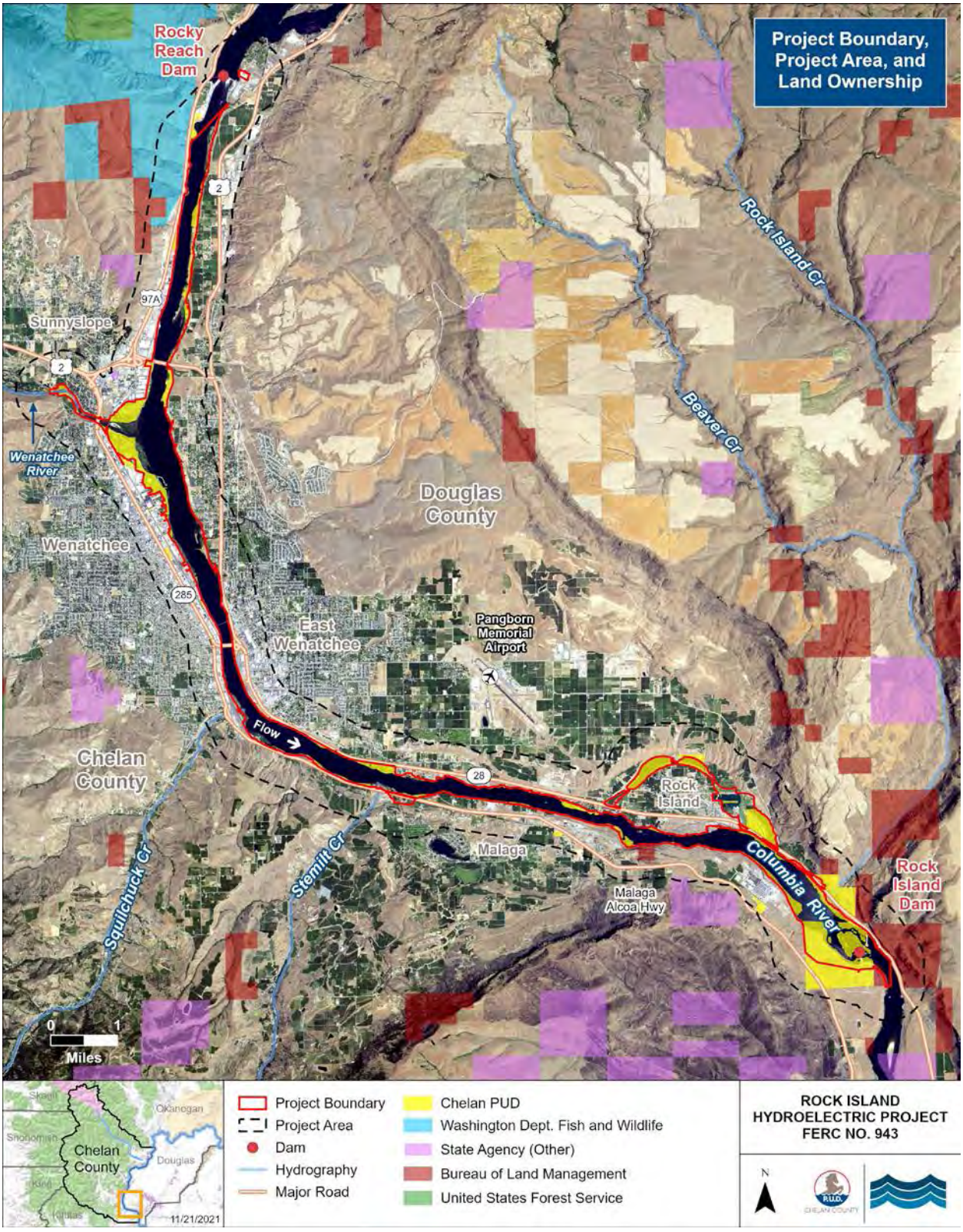

Figure 2-1 Project Boundary, Area, and Land Ownership

2.1 Chelan PUD Objectives and Guiding Principles

It is Chelan PUD's mission to relicense the Project in an environmentally responsible, economic manner that best serves its customers. Chelan PUD has three core objectives for relicensing the Project:

- Incorporate Our Values into the Relicensing Process – safety, stewardship, trustworthiness, and operational excellence.
- Address Project Impacts While Preserving Economic Stability – implement a relicensing process that provides the best chance of receiving the longest license term while considering stakeholder interests and preserving the Project's ability to be competitive in western power markets.
- Engage with Stakeholders – strengthen relationships with internal and external stakeholders through timely and effective engagement.

To help achieve these three core relicensing objectives, Chelan PUD has identified five guiding principles that will inform our engagement and decision making throughout the relicensing process, as follows:

- Chelan PUD places high value on establishing and maintaining trust and genuine relationships, and therefore, will work to ensure engagement at all levels of stakeholders' organizations, listening openly and seeking to understand all perspectives.
- Chelan PUD values the expertise and stewardship responsibilities of our federal, state, tribal, local government, and community stakeholders and is committed to a relicensing process in which we are science-based, trustworthy, transparent, forthright, and deeply engaged together.
- Chelan PUD believes that an effective relicensing process will involve proactive, direct, honest, and robust engagement that begins early, provides sufficient time for two-way dialogue and resolution of issues, and is informed by a robust environmental analysis. Where needed, Chelan PUD will engage beyond the requirements of federal regulations.
- Chelan PUD will work with our stakeholders during the environmental study development period and throughout the entire relicensing process to increase our mutual understanding of potential effects of the Project and diligently endeavor in good faith to find reasoned win-win solutions to address effects, while demonstrating value to our customer-owners.
- Chelan PUD prefers to resolve relicensing issues directly with our stakeholders where possible, working in a transparent manner, while acknowledging FERC's regulatory role in this federal process.

2.2 TWG Process and Relicensing Schedule

The TWGs will meet as needed throughout early engagement and formal relicensing to provide technical expertise (data gap identification, study plan development, study report review, etc.) associated with specific resource areas (Figure 2-2). The TWG process is intended to be a cooperative effort while also respecting the individual authorities and mandates of participating agencies, Tribes, and Chelan PUD's independent decision-making regarding the content of its license application, which will describe the Project's future operations.

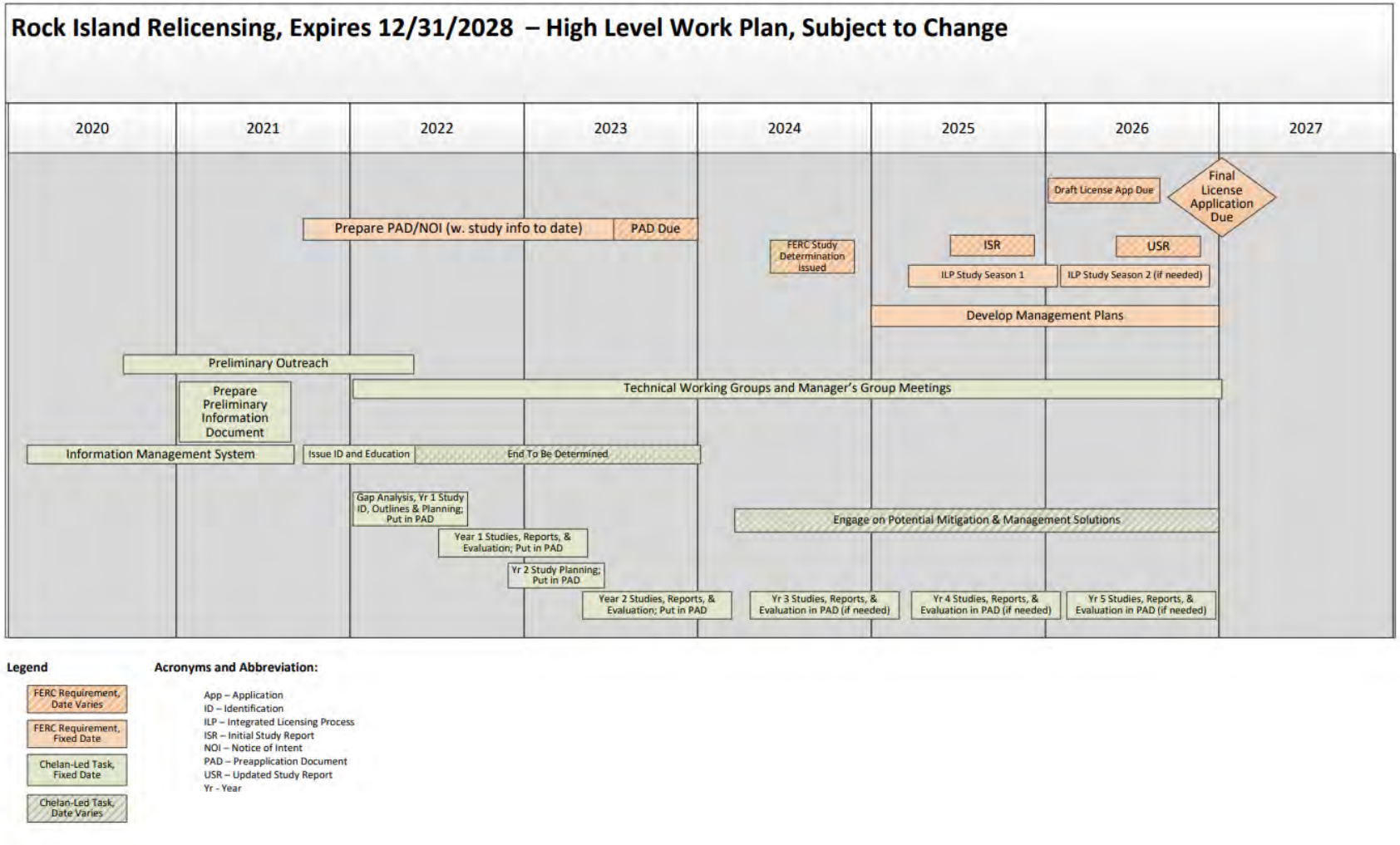

Figure 2-2 Proposed FERC Relicensing and Early Engagement Schedule

3.0 TWG STRUCTURE

The TWG structure is comprised of multiple working groups and associated sub teams focused on different resource areas relevant to the Rock Island relicensing process. Chelan PUD will hold the initial TWG kickoff meetings with interested stakeholders on January 18, 19, and 20, 2022. This multi-day event will begin with two half-day engagement workshops, with the third half-day session focused on familiarization with the FERC ILP relicensing process, a Project overview, and the development and scheduling of the TWG groups.

Chelan PUD plans to move forward initially with four TWGs, and sub teams as needed, while reserving the flexibility to adjust the number of groups in consultation with stakeholders. Although a fixed meeting schedule has not been set, Chelan PUD intends to hold regular reoccurring TWG meetings throughout early engagement and the formal relicensing process.

The proposed TWGs are:

- Fish and Aquatic Resources
- Wildlife and Botanical Resources
- Recreation and Land Management Resources
- Cultural and Historic Resources

Except for the privileged Cultural and Historic Resource TWG sessions, the TWGs will remain open to additional participation throughout the relicensing process. Privileged cultural sessions are designed to protect culturally sensitive information; therefore, this group will start out comprised of existing Rocky Reach and Lake Chelan Cultural Forum members. Please note that the Rock Island Cultural and Historic Resource TWG will be independent from existing cultural forums for Rocky Reach and Lake Chelan.

In addition to the formation of TWGs, Chelan PUD intends to establish a TWG Manager's Group (Director) line of communication with stakeholders. The TWG Manager's Group will be comprised of the supervisors of relicensing participants/leads. Regular meetings will be held to provide an opportunity for all interested management and TWG members to hear an overarching update of each TWG and sub team. The meetings will initially be held quarterly and adjusted as needed. Finally, it is expected that a regular email update will be provided to the TWG Manager's Group and all participants.

4.0 ROLES AND PARTICIPATION IN TWG PROCESS

The TWG process is open to all interested parties including state and federal agencies, Tribes, local governments, non-governmental organizations/not-for-profit organizations, community stakeholders, and members of the public. Participants are expected to commit to prepare for and attend meetings, review documents, and provide technical input to Chelan PUD and its consultants on methods, analysis, and interpretation in a timely fashion. The expected time commitment will vary significantly by resource area. Chelan PUD will also support a concurrent but separate outreach effort to provide information about the relicensing process via electronic communication and updates to the Rock Island relicensing website to all participants and interested public and stakeholders electing not to participate in the TWG process.

4.1 TWG Participant Responsibilities

TWG participant responsibilities include:

- Supporting the success of the TWG process by regularly attending in-person and virtual meetings or calls or ensuring a designated alternate can attend; come prepared to address noticed topics and questions; and review materials and provide comments within agreed timelines.
- Actively listen and meaningfully engage with relicensing participants; hearing participants' views regarding the information necessary to ultimately support the relicensing process.
- Providing relevant technical and scientific information, along with subject-matter knowledge and constructive advice.
- Cooperatively reviewing, commenting on, and openly discussing study outlines, plans, reports, and potential resource management plans, as requested by Chelan PUD.
- Respect meeting-specific guidelines and agendas intended to promote constructive communication.
- Work with other participants, while seeking to integrate the various needs and interests into solutions that work for multiple stakeholders.
- Represent the interests and authorities of an agency, tribe, or organization, including having the appropriate levels of decision-making authority to facilitate productive working sessions while respecting the interests and authorities of others.

4.2 Decision Making Process

The role of the TWG is to help inform Chelan PUD's development of the pre-application document (PAD) and identify data gaps that may require study during relicensing. The TWG process will include multiple opportunities to identify common areas of agreement, as well as to clarify areas of disagreement. In the event of disagreement during early engagement, at Chelan PUD's discretion, additional discussions will continue, or resolution may be deferred to the formal FERC relicensing process, after the PAD is submitted. Decisions and parking lot items (topics reserved for discussion at a later time) will be noted by the TWG facilitator and included in the summary minutes for inclusion with the PAD and associated consultation records. Chelan PUD reserves the right to conduct additional studies related to these and other areas during the relicensing process.

4.2.1 Early Engagement and Study Plan Development Decision Making

Throughout the early stage of the relicensing effort, prior to the PAD filing, Chelan PUD will make decisions regarding the contents of the PAD and early proposed relicensing studies, informed by transparent, technical dialogue with relicensing participants. All work conducted with the TWGs and any early studies undertaken by Chelan PUD as a result of TWG engagement will be documented in the PAD.

For studies proposed during the early relicensing process, Chelan PUD developed a study outline with guidance (Attachment A) which summarizes the criteria a study request should meet before proceeding to development of a study plan. The criteria are intended to help formulate a well-structured request that can help focus TWG discussions about the applicability of a study to evaluate the effects of the Project on environmental resources.

4.2.2 FERC Relicensing Decision Making

The submittal of the Rock Island PAD formally initiates the FERC relicensing process. At this stage, FERC leads the relicensing process and becomes the primary decision maker. Chelan PUD intends to continue TWG meetings throughout the formal relicensing process to meet the objectives identified in Section 1.0.

4.2.3 TWG Participants

Each TWG member agency, Tribe, or participant is encouraged to designate a primary participant for each working group, along with one or more alternates. Alternate members are welcome to attend meetings as observers. If an alternate member is asked to fill in for a primary member, it is the primary member representative's responsibility to ensure that the alternate member is

briefed on the most up-to-date process. In the event that neither can attend, the member should review meeting materials posted to the website to stay up to speed. Input and progress will occur in the regularly scheduled meetings.

If a representative (participant or alternate) is unable to continue participation in the TWG, a replacement will be designated by the participating entity. The TWG member is required to notify Chelan PUD of the change in role representation prior to the next TWG meeting by email at RIRelicensing@chelanpud.org. To subscribe a new member and role, visit www.chelanpud.org/newlicense and click on "Subscribe Here" to inform the Relicensing Team of the new member. The Relicensing Team will make the updates as needed within the system.

Interested members of the public are welcome to attend throughout the relicensing process; they are encouraged to find others with similar interests and form groups with a primary participant and alternate, as possible. TWG members are expected to work with their constituencies. Interested members of the public are encouraged to contact and communicate with TWG members to stay informed or communicate relevant information. Meeting materials, including summaries of the TWGs, will be posted on the Chelan PUD relicensing web page, www.chelanpud.org/newlicense.

5.0 COMMUNICATIONS

A successful TWG process will require timely, consistent, and transparent communication of information. This includes:

- Initial meeting notices. The primary mode of communication regarding meetings will be via email and the Chelan PUD Rock Island relicensing website (www.chelanpud.org/newlicense). Newspapers will also be used when required.

- Agendas, meetings summaries, presentations, and documents for the TWG meetings. Meeting agendas, summaries, and associated materials will be available on the Chelan PUD Rock Island relicensing website (www.chelanpud.org/newlicense), via email, and direct mail for those without email access, or by specific request. Further details on locating TWG meeting materials on the website are provided in Attachment B.

- Draft documents circulated for review and comments. Chelan PUD will distribute all documents electronically in standard Microsoft Office format or portable document format (PDF). For filing of FERC documents, Chelan PUD will use electronic filing, and will post these documents on the Rock Island relicensing website (www.chelanpud.org/newlicense) within five business days of the official FERC submittal. On a case-by-case basis, Chelan PUD will distribute hard copies to individuals with limited access to electronically available documents.

- Subscription list. To subscribe to notifications, visit the Chelan PUD Rock Island relicensing website (www.chelanpud.org/newlicense) and select "Subscribe Here".

5.1 Guidelines for Timing of Information Reviews and Comments for the TWG Process

The following guidelines are proposed for the TWG Process to support timely, consistent, and transparent communication:

- The Chelan PUD team will use good faith efforts to issue preliminary agendas no less than 14 days prior to the scheduled meeting. Participants may submit proposed changes via email within seven days of receipt of the agenda or may suggest changes at the meeting. With respect to documents that need to be reviewed prior to the meeting(s), Chelan PUD will use good faith efforts to distribute these documents to participants electronically at least seven days prior to the scheduled meeting(s).

- Virtual meetings will not be recorded unless specifically agreed to by the TWG.

- Meeting summaries will be reviewed by the facilitator prior to the end of each TWG meeting. The Chelan PUD team will post meeting summary minutes (topics, action items, parking lots, and decisions) to the Rock Island relicensing website

(www.chelanpud.org/newlicense) within five business days following the end of a TWG meeting.

- Chelan PUD will strive to respond to incoming inquiries (via phone or email) within two business days. When a response requires more time, Chelan PUD will let the stakeholder know that the inquiry was received, and that more information will be provided.

- Unless another timeline has been agreed to, TWG members will respond to draft documents within two 10 business days of receiving them or at the end of the agreed review process. It is important to note that once Chelan PUD has initiated the formal FERC process, certain deadlines will not be within Chelan PUD's or the TWG's control.

- For the general public not participating in regular TWG meetings, regular updates will be provided on the Chelan PUD Rock Island relicensing website (www.chelanpud.org/newlicense).

ATTACHMENT A
TWG EARLY ENGAGEMENT STUDY OUTLINE WITH GUIDANCE

STUDY PLAN OUTLINE WITH GUIDANCE

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

JANUARY 2022

STUDY PLAN OUTLINE WITH GUIDANCE

ROCK ISLAND HYDROELECTRIC PROJECT RELICENSING

FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

JANUARY 2022

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LIST OF FIGURES

LIST OF TABLES

[to be generated when study plan is complete]

LIST OF PHOTOS

[to be generated when study plan is complete]

1.0 TITLE OF PROPOSED STUDY

1.1 Study Goals and Objectives

The goals and objectives section should explain:

- The overall objective of the study;
- How the information to be developed in the study is not already addressed by existing information;
- How the information to be produced by the study is directly related to an identified issue statement;
- How the study relates to an identified ongoing project effect; and
- How the results of the study would inform proposed future license conditions.

1.2 Relevant Resource Management Goals and Public Interest Considerations

Clearly establish the connection between the proposed study and management goal(s) of the agency or Tribe with jurisdiction over the resource to be studied. A statement by an agency relating its proposed study to a legal, regulatory or policy mandate is entitled to appropriate consideration, but it may be difficult to determine just how the information that will be obtained will achieve that legal, regulatory, or policy mandated. Please explain how the mandate relates specifically to the proposed study and, in turn, project impacts.

For example, if a state has a specific management goal to obtain a certain quantitative measure (e.g., fish per mile) of the quality of a trout fishery in a stream reach that is affected by a project, the proposed study should explain how it relates to that management goal.

For non-governmental agencies or others without a jurisdictional mandate or obligation, such as members of the public, this section should describe the connection between the study and resource of interest.

1.3 Existing Information and Need for Additional Information

Describe existing information concerning the subject of the proposed study (if any), why any existing information is not adequate, and the need for additional information to address the relevant resource issues(s).

1.4 Project Nexus and Rationale for Study

Explain the nexus between Project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements. These terms have the following meanings:

- Direct effects: Direct effects, which are caused by the action and occur at the same time and place.

- Indirect effects: Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

- Cumulative effects: the impact on the environment which results from the incremental impact on the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

1.5 Geographic Scope

Describe the geographic scope of the proposed study, and include a figure that displays the geographic scope (Figure 1-1). Include a specific description of the overall geographic boundaries of the study, and a justification for the proposed scope if the boundaries extend beyond the FERC boundary of the Project.

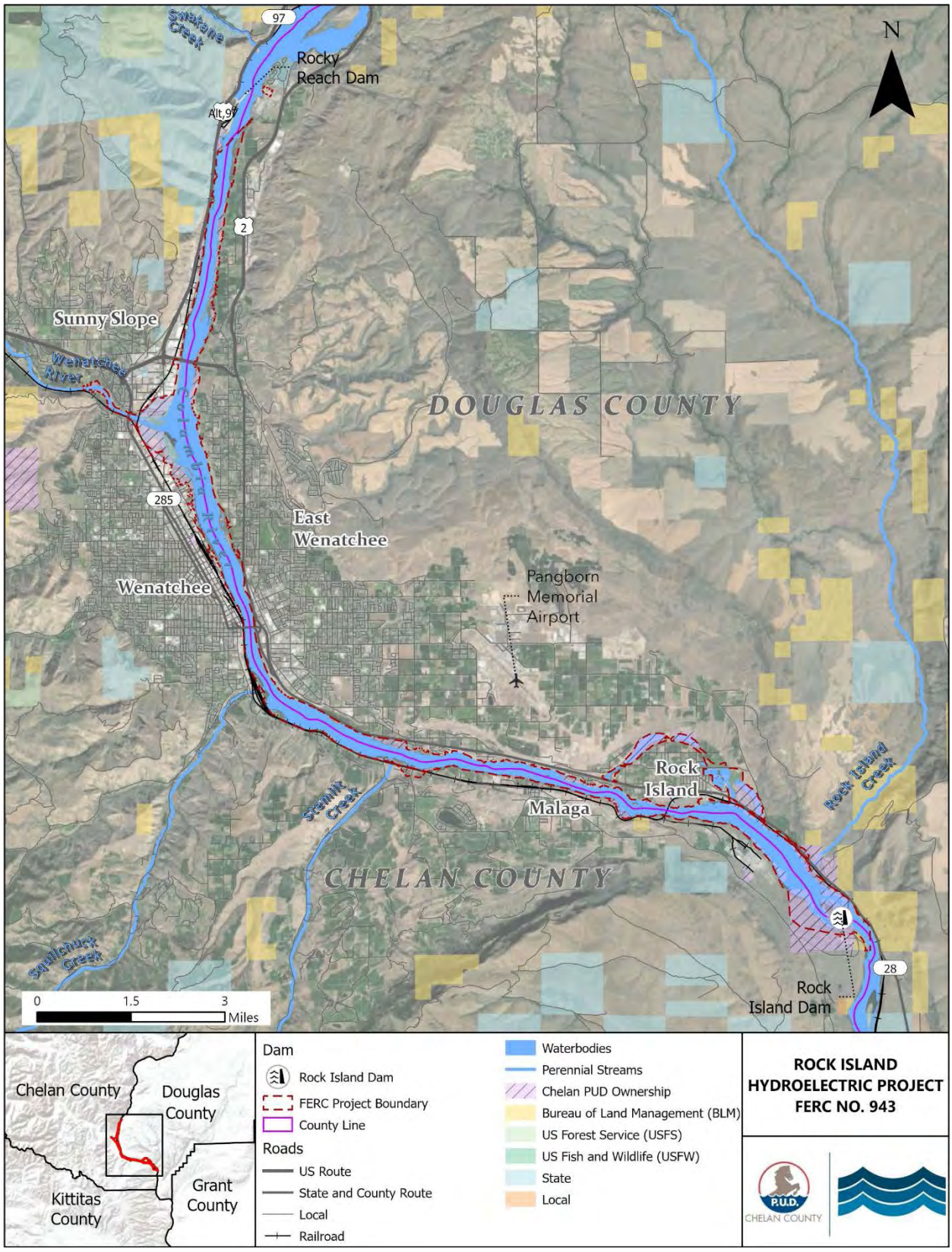

Figure 1-1 Rock Island Hydroelectric Project Location

1.6 Study Methodology

Describe the proposed study methodology, including any preferred data collection and analysis techniques, or method for objectively quantifying information. Define specific methods to be implemented (e.g. study area, study sites, data collection methods, etc.) or simply reference an approved and established study protocol or methodology.

Demonstrate how the requested method is consistent with generally accepted practice within the scientific community or, as appropriate, considers relevant Tribal values and knowledge.

1.7 Schedule, Periodic Reporting, and On-Going Consultation

Describe the schedule for conducting the study, including the proposed number of field season(s), and a provision for a periodic update stakeholders, including the manner and extent to which information will be shared, and sufficient time for technical review of the analysis and results. The periodic update on study progress is suggested half way through the first and second study years.

1.8 Level of Effort and Cost

Describe the level of effort and costs associated with the development and implementation of the requested study. Provide justification as to why any proposed alternative studies would not be sufficient to meet the stated information needs.

1.9 References

Provide citations for external sources of information cited in the format of the example below.

Example Reference (ER). 2008. Lewiston Hydroelectric Project No. 1212 Resource Management Plan Five Year Implementation and Monitoring Report 2003-2007. Nashville, Tennessee: TVA.

ATTACHMENT B
HOW TO FIND EVENT MATERIALS

Home / Hydropower / FERC Licensing and Compliance / Rock Island Relicensing

Rock Island Relicensing

Chelan PUD is beginning the relicensing process for the Rock Island Hydroelectric Project (FERC No. 943). Please use this page to find out how to get involved and stay up to date. If you have questions regarding this Project, please reach out to the relicensing team via the Contact Us information below or using the relicensing e-mail address: RIRelicensing@chelanpud.org.

Relicensing Events

Relicensing Documents (Documentos de La Renovación de Licencia)

Documents Open for Comment

FERC Process

Click on 'Relicensing Events'

Event Details

Event	Start	End	Location	Link
Rock Island Relicensing TWG Kickoff Part 3 of 3	1/20/22 8:00 AM	1/20/22 5:00 PM	MSTeams Virtual	
Rock Island Relicensing TWG Kickoff Part 2 of 3	1/19/22 8:00 AM	1/19/22 12:00 AM	MS Teams Virtual	
Rock Island Relicensing TWG Kickoff Part 1 of 3	1/18/22 8:00 AM	1/18/22 12:00 PM	MSTeams Virtual	
Stakeholder Meeting - Post Workshop	11/18/21 1:00 PM	11/18/21 2:00 PM	MSTeams Virtual Meeting	
Rock Island Relicensing Stakeholder Workshop	10/14/21 7:30 AM	10/14/21 2:00 PM	MS Teams Virtual Meeting	
Virtual Open House	7/8/21 6:00 PM	7/8/21 7:00 PM	Zoom	
Pybus Market Outreach	6/26/21 7:00 AM	6/26/21 10:00 AM	Pybus Market booth	

Click on the Event you are looking for information on

Click on the "link" icon to view the related event document

Event Materials

Event	Document Name	Document Type	Click to View	Topics
Rock Island Relicensing TWG Kickoff Part 1 of 3	2021-01-18 TWG Kickoff Engagement Workshop Day 1 Agenda	Agenda		All
Rock Island Relicensing TWG Kickoff Part 1 of 3	Engagement Workshop Handout (IAP2 Spectrum)	Presentation		All
Rock Island Relicensing TWG Kickoff Part 1 of 3	Engagement Workshop Handout (Stages of Collaboration)	Presentation		All
Rock Island Relicensing TWG Kickoff Part 1 of 3	Engagement Workshop Handout (Trust and Collaboration)	Presentation		All
Rock Island Relicensing TWG Kickoff Part 1 of 3	Engagement Workshop Handout (UWisc Ext D&D)	Presentation		All
Rock Island Relicensing TWG Kickoff Part 1 of 3	Rock Island Relicensing 2021 Recap 2021-01-04	Correspondence		All

APPENDIX C DETAILED PROJECT MAP SERIES


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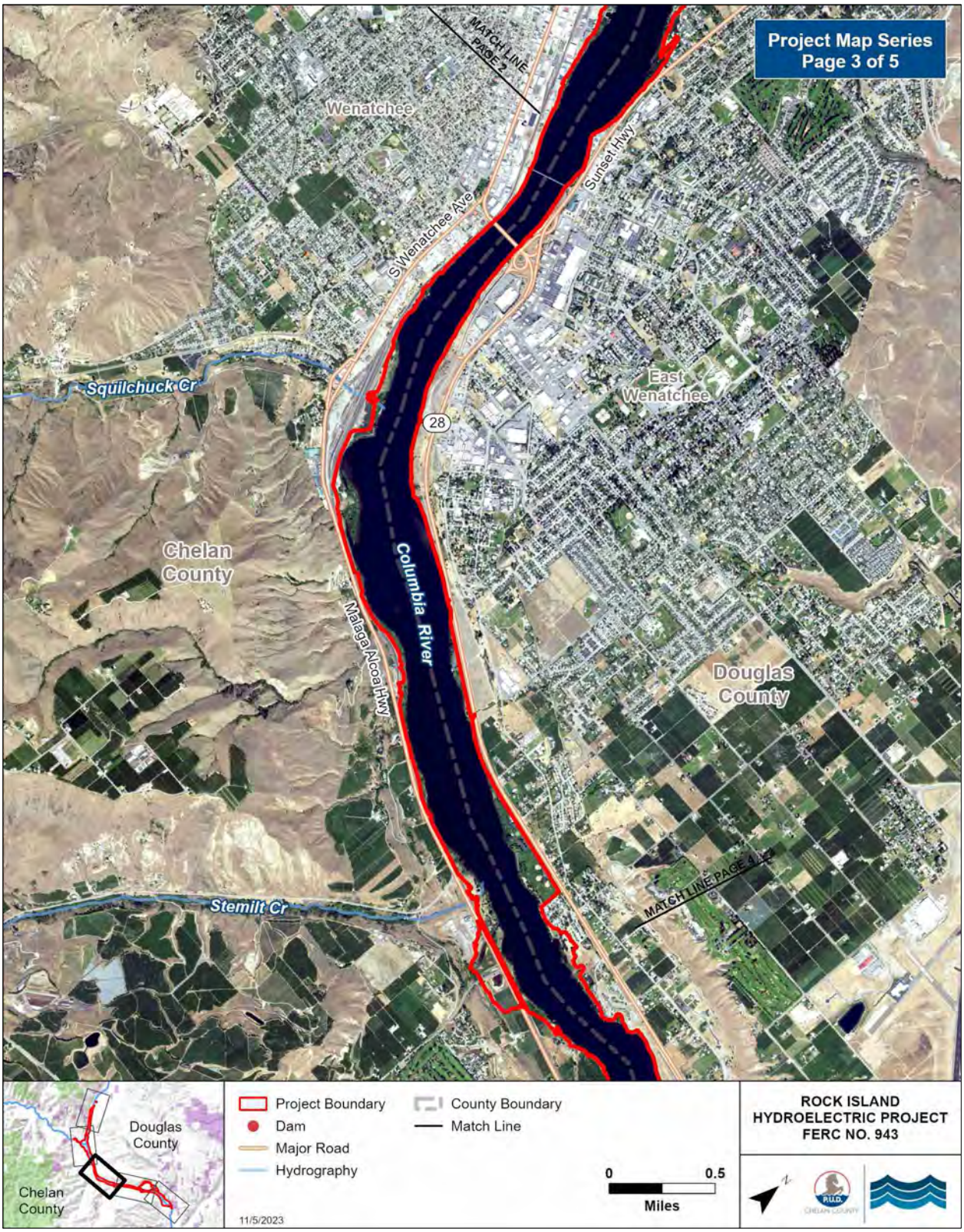
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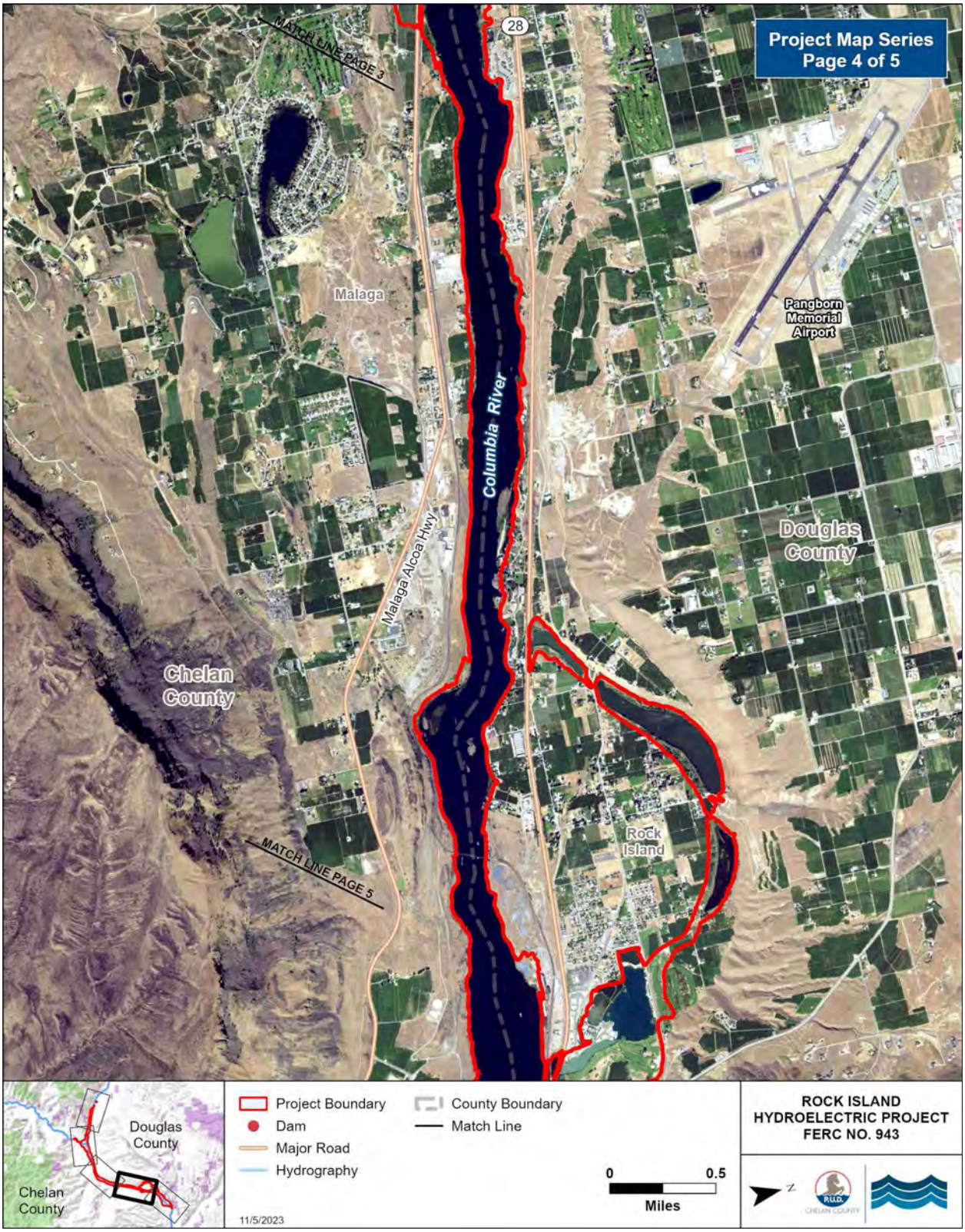
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APPENDIX D SINGLE LINE DIAGRAM (CEII)

APPENDIX E TECHNICAL MEMORANDUMS

E.1 MAINSTEM POOL METRICS AND CURVES

TECHNICAL MEMO

To: Public Utility District No. 1 of Chelan County
327 N. Wenatchee Avenue
Wenatchee, WA 98801

From: Northwest Hydraulic Consultants, Inc.

cc: Janel Ulrich, Hydro Licensing Manager

Date: May 4, 2023

Re: Rock Island Mainstem Pool Metrics and System Curves

ROCK ISLAND HYDROELECTRIC PROJECT

FERC NO. 943

INTRODUCTION

The Public Utility District No. 1 of Chelan County (Chelan PUD) is the current licensee, owner, and operator of the Rock Island Hydroelectric Project (Rock Island Project), Federal Energy Regulatory Commission (FERC) Project Number 943, located approximately 12 miles downstream of the city of Wenatchee, and 20 miles downstream of the Rocky Reach Hydroelectric Project (Rocky Reach Project; FERC Project No. 2145). The Rock Island Project spans the Columbia River and includes lands in Chelan and Douglas counties, Washington. Chelan PUD intends to file an application for a new license from FERC prior to December 31, 2026, two years before the license expiration date, as required by FERC regulations.

This memorandum provides a summary of updates to the Rock Island mainstem pool technical information metrics and the development of new system stage-storage-discharge curves from 2021 bathymetry data and through the application of a two-dimensional (2D) hydraulic model as part of Study ID 473634, Pool Flux Evaluation. A hydraulic model was selected to develop the needed project information because it enhances the available spatial extents, range of flow, and forebay stage conditions for which water level information is available within the Rock Island Project. Three reporting sections are provided below that describe:

- Bathymetric data used for development of the Rock Island Project metrics and hydraulic modeling;
- Hydraulic model application to develop system stage-storage-discharge curves; and
- Updates to Rock Island mainstem pool technical information metrics.

BATHYMETRY DATA

The bathymetric survey upon which the metrics and system curves are based consists of a combination of topobathymetric Light Detection and Ranging (LiDAR) data, covering the shallow areas around the edges of the reservoir, and multi-beam bathymetric survey, covering the remainder of the reservoir. NV5 Geospatial collected the LiDAR data on March 13, 2021 (NV5 2021), and the bathymetric survey data were collected by Northwest Hydraulic Consultants, Inc. (NHC) over 19 days between June 29 and July 16, 2021, and December 1 to 3, 2021 (NHC 2023a). The extents of each of the topographic LiDAR, bathymetric LiDAR, and bathymetric survey coverage areas are shown in Figure 1.

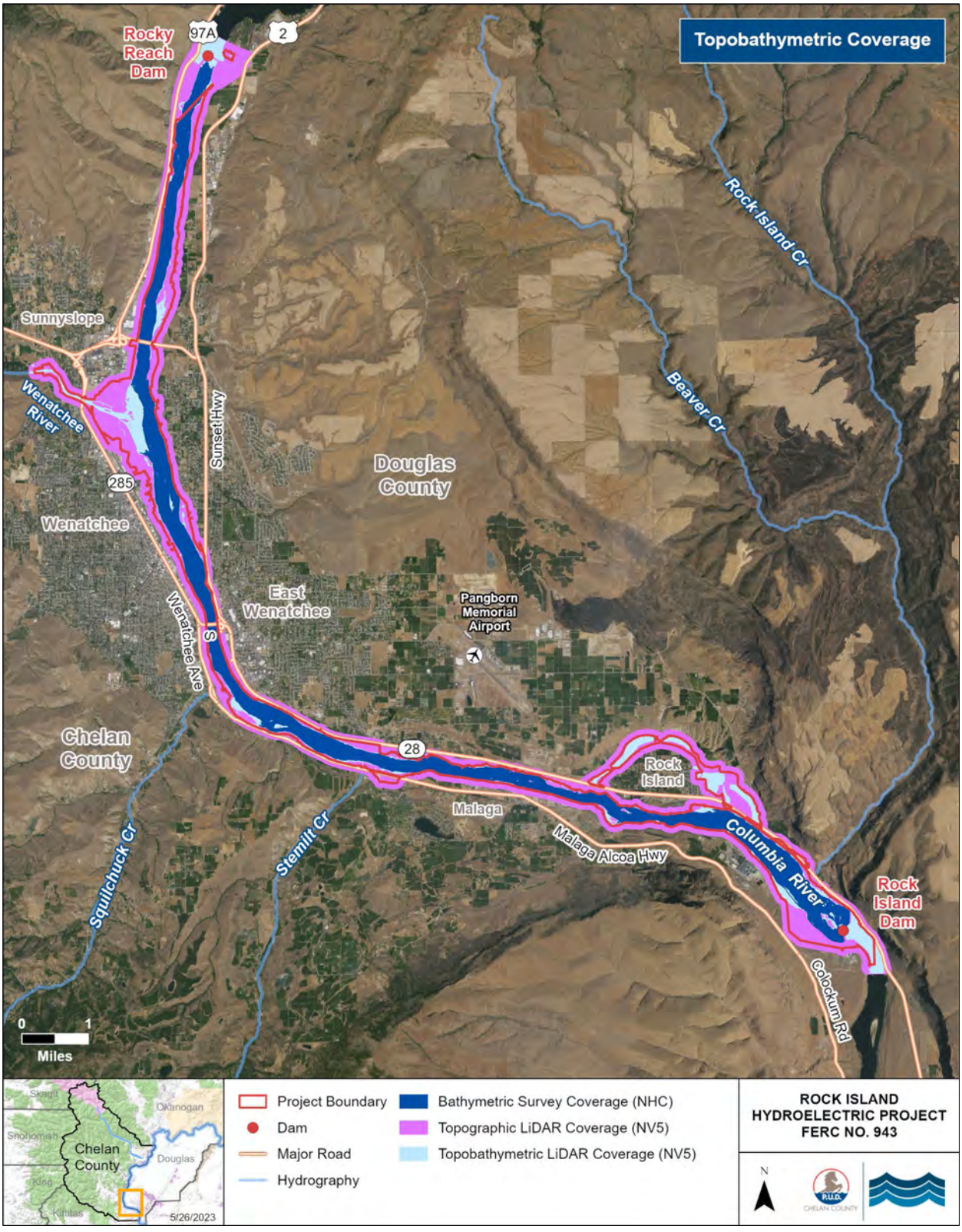


Figure 1 Extents of Bathymetric, Topobathymetric, and LiDAR Coverage

MODEL APPLICATION TO DEVELOP SYSTEM CURVES

The 2D hydraulic model for developing system curves for the Rock Island mainstem pool used Version 6.3.1 of the United States Army Corps of Engineers (USACE) Hydrologic Engineering Center River Analysis System (HEC-RAS) modeling framework. Following standard model calibration practice, prior to applying the model to characterize the Rock Island Project, the model parameters (e.g., bed roughness coefficients) were adjusted to achieve an acceptable match between simulated and observed water level, velocity, and flow data. Chelan PUD and NHC collected the data used for calibration between 2017 and 2022 at over one dozen locations within the Rock Island mainstem pool over a range of low, moderate, and high flow conditions. The resulting model calibration, documented in detail in NHC (2023b), is considered acceptable for simulating water depth and velocity within the Rock Island mainstem pool. The mean absolute error in simulated water level relative to observed was 0.8 ft or less at all water level stations and flows, with only one station exceeding 0.5 ft of mean error and only during high flows (approximately 350 thousand cubic feet per second [kcfs]).

Following calibration, the hydraulic model was applied to develop data characterizing water level, storage volume, and flow velocities throughout the Rock Island mainstem pool. Model outputs were created for 126 combinations of Rocky Reach dam discharge (ranging from 20 to 464 kcfs) and Rock Island dam forebay elevation (ranging from 608.0 to 613.0 ft NGVD 29[1]). Input flows contributing from the Wenatchee River were applied as a function of the corresponding flow at Rocky Reach dam:

A) When Rocky Reach flows are below 350 kcfs, the Wenatchee River inflow is assumed to be 3,000 cfs; and

B) When Rocky Reach flows are at or above 350 kcfs, the Wenatchee River inflow is assumed to be 10,000 cfs.

These two flow inputs and the water level specified at the Rock Island dam forebay, all referred to as model boundary conditions, are highlighted in Figure 2.

[1] National Geodetic Vertical Datum of 1929

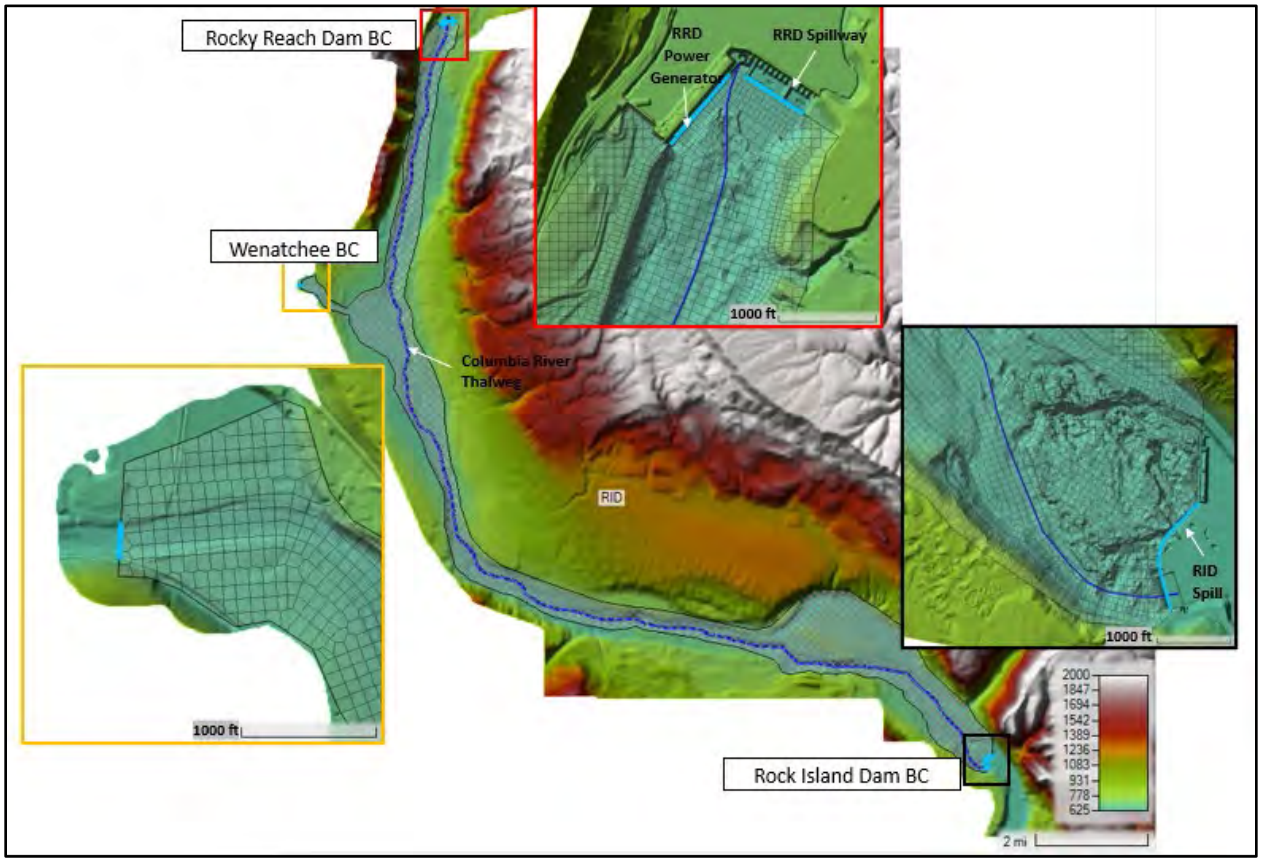


Figure 2 Model Boundary Condition Locations

Six curves representing discharge vs. total storage (Figure 3) were then developed from the resulting model output corresponding to Rock Island forebay stages of 608.0, 609.0, 610.0, 612.0, and 613.0 ft NGVD 29. Only selected model runs were performed above 350 kcfs, so there is less definition above that discharge. Additionally, Rock Island Project operating procedures call for progressively lower Rock Island forebay elevations at discharges above 440 kcfs, such as specifying a forebay stage of 608 ft NGVD 29 at 500 kcfs. As expected, the resulting curves show more effect on storage from changes in Rock Island forebay stages at lower discharges and less at higher discharges. The same information used to develop the discharge vs. total storage curves was also presented in an alternative format, storage vs. forebay stage curves, for selected Rocky Reach discharges found in Attachment A as Figure A- 1.

Water-surface elevation profiles for Rock Island forebay stages of 608.0, 609.0, 610.0, 612.0, and 613.0, 608.0, 612.5, and 611.8 ft NGVD 29 are also provided in Attachment B as Figure B- 1 through Figure B- 8 respectively.

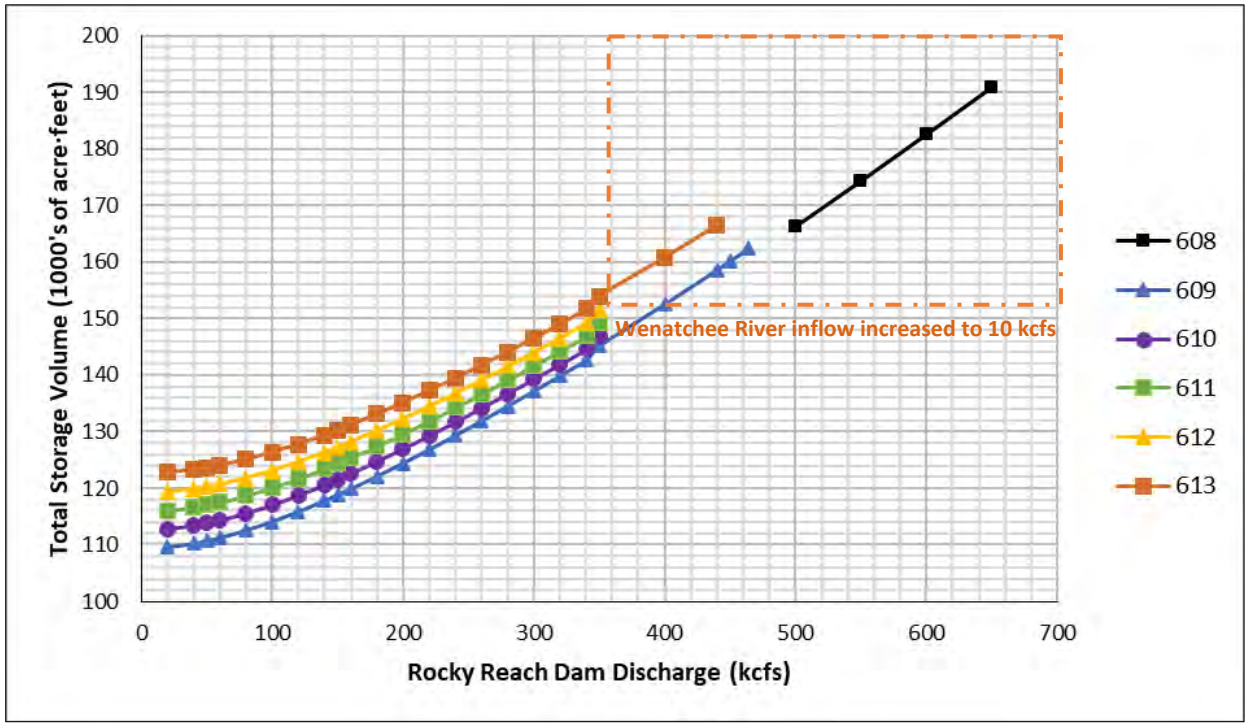


Figure 3 Rock Island Mainstem Pool Total Storage vs. Discharge Curves for Rock Island Forebay Water Levels 609, 610, 611, 612, and 613 ft NGVD 29

UPDATED ROCK ISLAND MAINSTEM POOL TECHNICAL INFORMATION METRICS

Technical information metrics describing eight geometric and hydraulic properties of the Rock Island mainstem pool were updated from values previously included in the effective Rock Island Project license. These metric values were updated by interpreting the 2021 bathymetry data and using depth and boundary polygon datasets extracted from the 2D hydraulic model outputs corresponding to typical operating conditions. For the purposes of developing these technical information metrics, typical operating conditions correspond to 100 kcfs of flow from Rocky Reach dam, 3,000 cfs from the Wenatchee River, and a Rock Island forebay water level of 612 ft NGVD 29. Some metrics also consider conditions when the Rock Island forebay stage is at its maximum elevation of 613.0 ft NGVD 29 or, in the case of the usable storage metric, the difference in storage between forebay elevations of 613.0 and 609.0 ft NGVD 29. The eight metrics are listed in Table 1, along with the legacy value from the effective license and the updated value based on the 2021 bathymetry data and hydraulic model outputs. Definitions of each metric, a description of the applied calculation methodology, and associated Geographic Information System (GIS) datasets are included in Attachment C. Ten GIS feature datasets have been included in the geodatabase "RI_OPS_PLFLX_QC3_ResPoolMetrics_NHC_20230504.gdb ".

Table 1 Rock Island Mainstem Pool Technical Information Metrics

METRIC NUMBER	METRIC DESCRIPTION	LEGACY VALUE FROM EFFECTIVE LICENSE	UPDATED VALUE USING 2021 DATA	UNITS
1	Gross storage capacity	130,000	126,312	acre-ft
2	Usable storage	11,700	12,189	acre-ft
3	Area of reservoir	3,120	3521.7	acre
4	Maximum length of reservoir	20	20.71	miles
5	Shoreline perimeter	50	52.56	miles
6	Average width of reservoir	1500	1389	ft
7	Maximum depth	75	213.7	ft
8	August average water particle travel	1.7	2.20	feet per second

CLOSURE

The information provided herein has been provided at the request of Chelan PUD in support of the Rock Island Relicensing Project. All methods and calculations have followed current engineering practice. If you have any questions about the methods or need additional information, please do not hesitate to contact us.

Sincerely,

Northwest Hydraulic Consultants Inc.

Derek Stuart, PE
Principal

XueXin Xu, EIT
Water Resources Specialist

REFERENCES

Northwest Hydraulic Consultants, Inc. (NHC). 2023a. Draft Rock Island Dam Relicensing 2021 Multibeam Survey. Prepared by Northwest Hydraulic Consultants, Inc. Prepared for Chelan County PUD. May 2023.

_____. 2023b. Draft Rock Island Project Hydraulic Model Development and Calibration. Prepared by Northwest Hydraulic Consultants, Inc. Prepared for Chelan County PUD. May 2023.

NV5. 2021. Rock Island Pool, Washington. Topobathymetric Lidar Technical Data Report. Prepared by NV5 Geospatial. Prepared for Northwest Hydraulic Consultants. May 28, 2021.

Attachment A Rock Island Mainstem Pool Total Storage vs. Stage Curves for Rocky Reach Dam Selected Discharges Between 20 and 650 kcfs

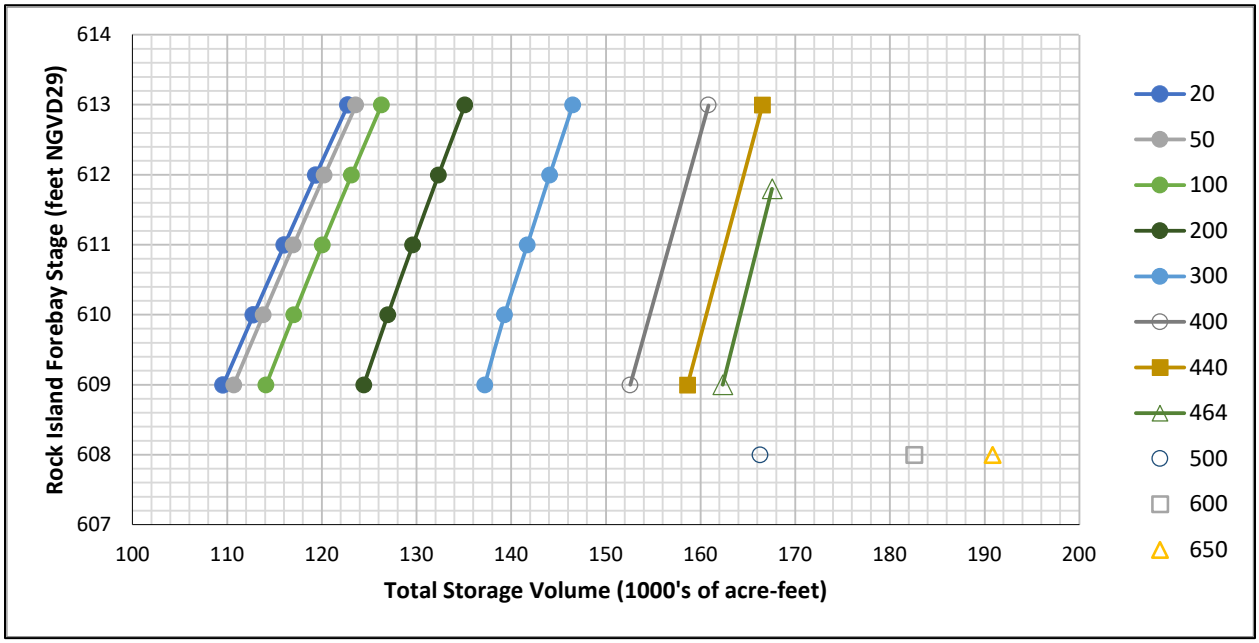


Figure A- 1 Rock Island Mainstem Pool Total Storage vs. Stage Curves for Rocky Reach Dam Selected Discharges Between 20 and 650 kcfs

Attachment B Water-surface Elevation Profiles, Rock Island Forebay Water Levels 608.0, 609.0, 610.0, 612.0, and 613.0, 608.0, 612.5, and 611.8 ft NGVD 29

Note: Stationing used to measure "River Mile from Rock Island Forebay" distance used for x-axis on profile plots is derived from the GIS dataset "CCPUD_RI_RM_Pts_from_RIThalweg_20220929". These points are measured in even river miles upstream of the downstream face of Powerhouse #2 at Rock Island.

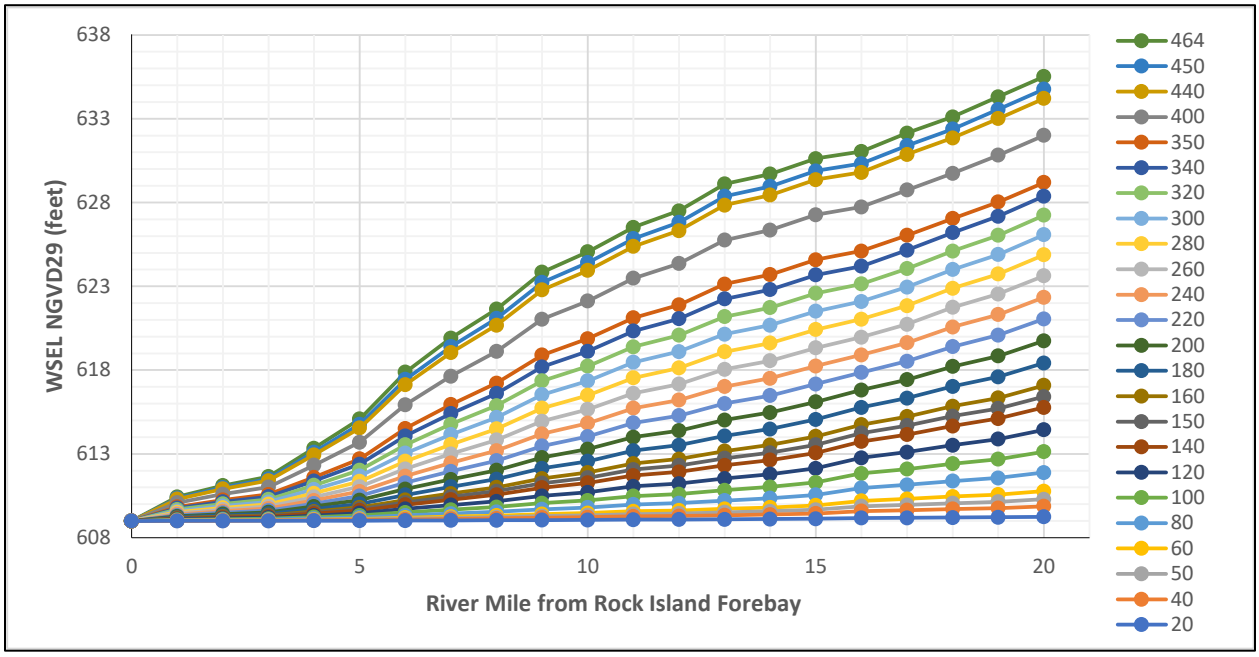


Figure B- 1 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 609.0 ft NGVD 29 and Rocky Reach Dam Discharge Ranges from 20 to 450 kcfs

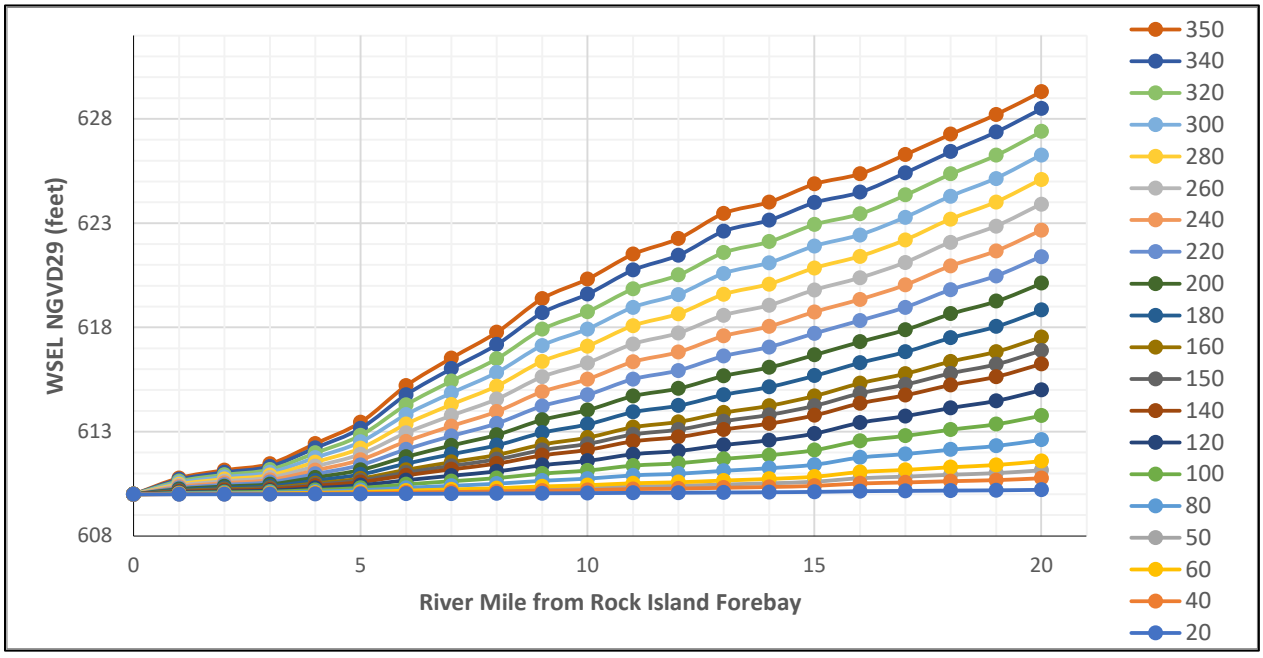


Figure B- 2 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 610.0 ft NGVD 29 and Rocky Reach Dam Discharge Ranges from 20 to 350 kcfs

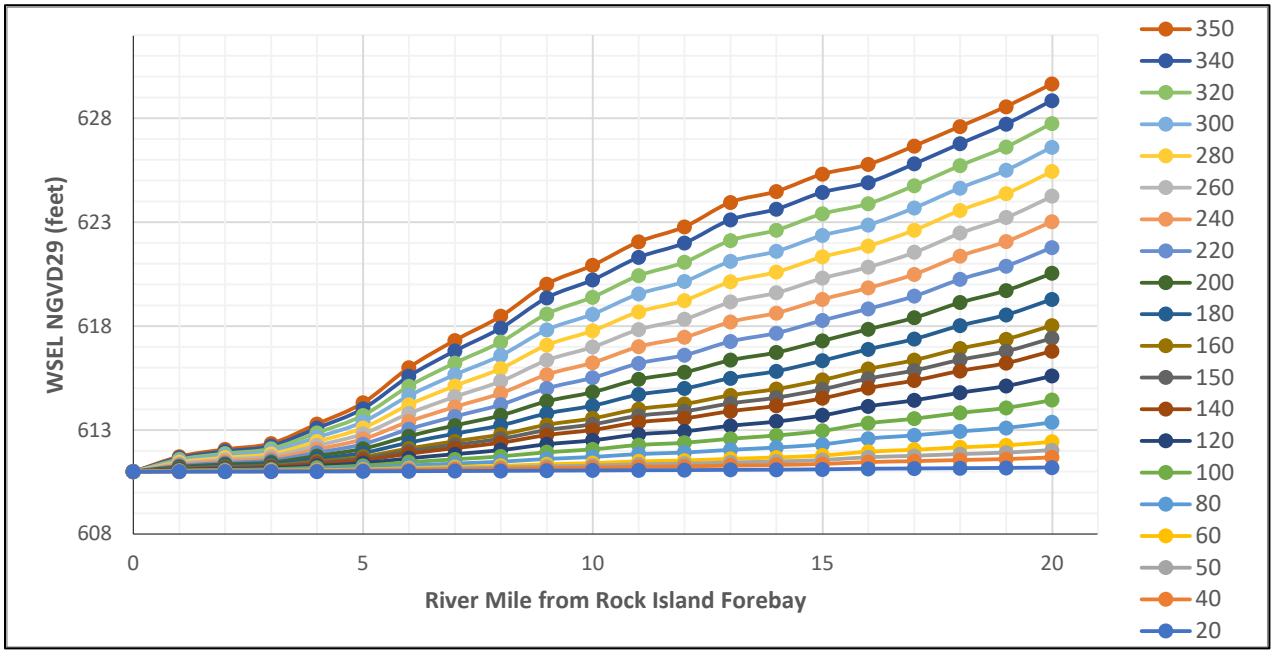


Figure B- 3 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 611.0 ft NGVD 29 and Rocky Reach Dam Discharge Ranges from 20 to 350 kcfs

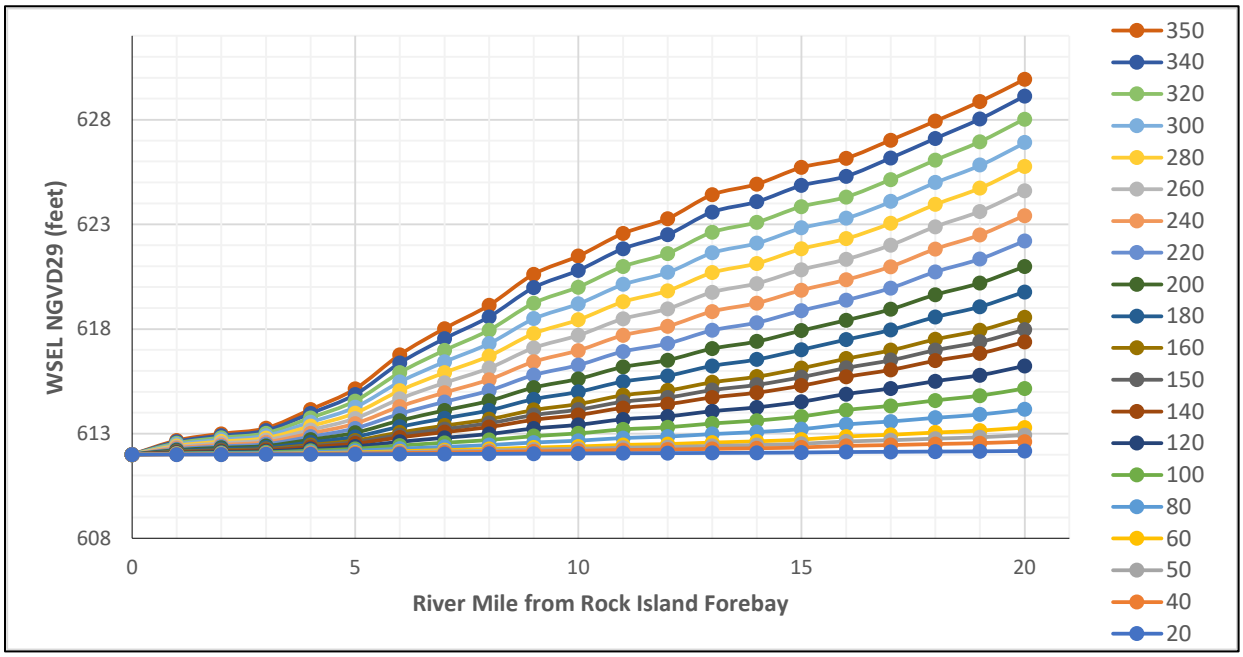


Figure B- 4 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 612.0 ft NGVD 29 and Rocky Reach Dam Discharge Ranges from 20 to 350 kcfs

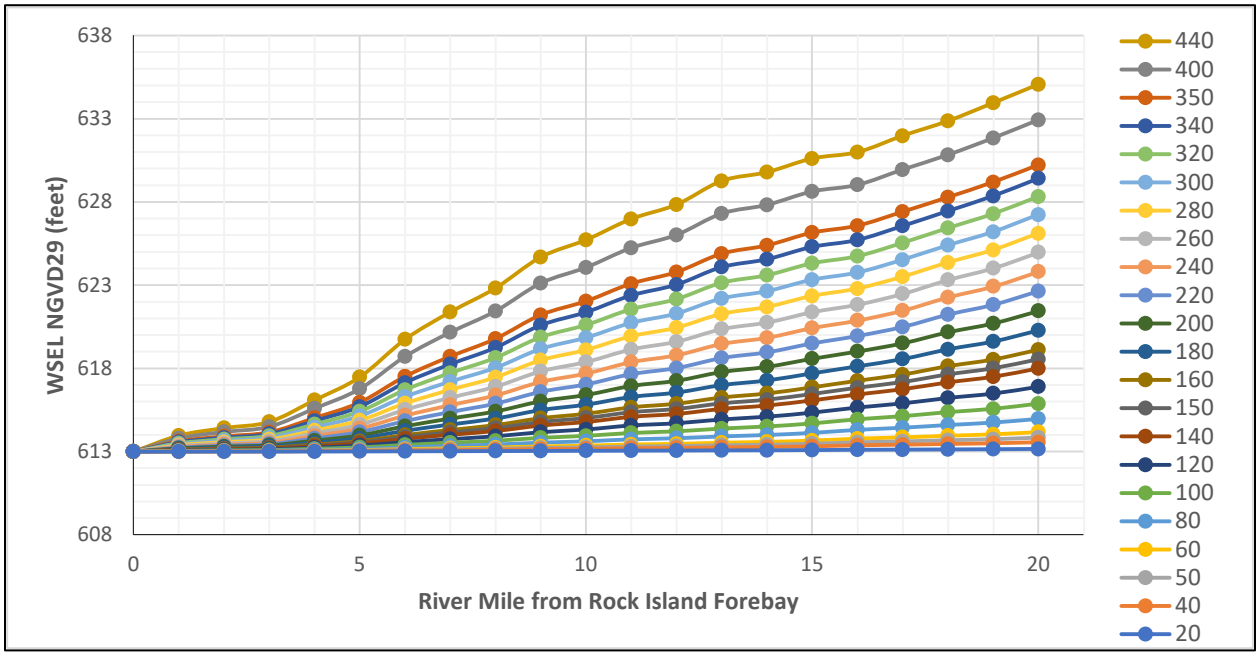


Figure B- 5 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 613.0 ft NGVD 29 and Rocky Reach Dam Discharge Ranges from 20 to 440 kcfs

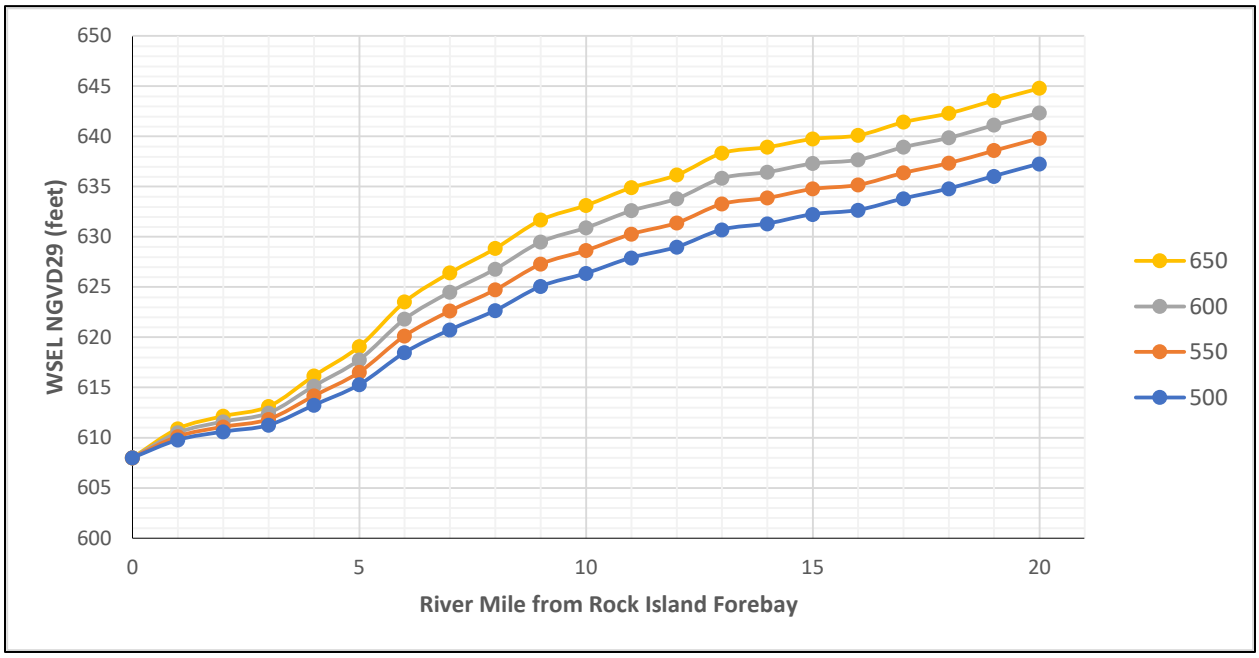


Figure B- 6 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 608.0 ft NGVD 29 and Rocky Reach Dam Discharge Ranges from 500 to 650 kcfs

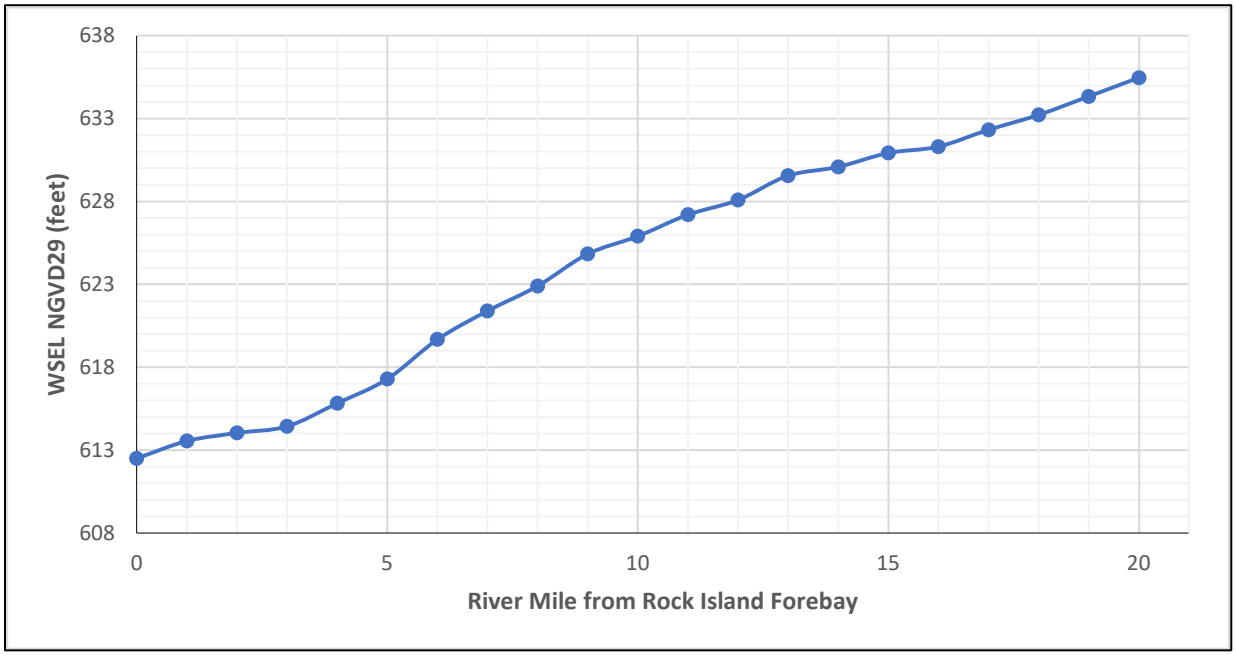


Figure B- 7 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 612.5 ft NGVD 29 and Rocky Reach Dam Discharge of 450 kcfs

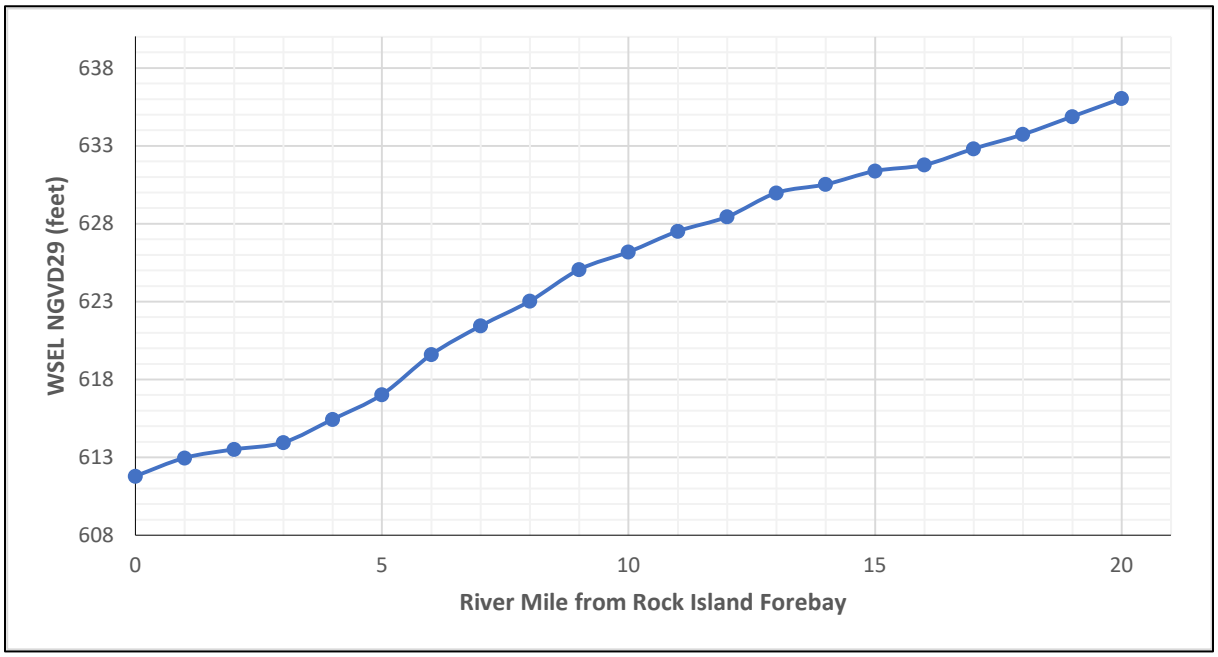


Figure B- 8 Water-surface Elevation Profiles, Rock Island Forebay Water Level at 611.8 ft NGVD 29 and Rocky Reach Dam Discharge of 464 kcfs

Attachment C Rock Island Mainstem Pool Technical Information Metric Definitions, Calculation Methods, and Supporting GIS Datasets

Metric 1 - Gross Storage Capacity

Definition: Gross project storage capacity in acre-feet when Rock Island forebay stage is set at 613 ft NGVD 29 and Rocky Reach dam flow is 100 kcfs.

Calculation Method: Product of total simulated inundation area and the average depth raster output from the model run with Rock Island forebay at elevation 613 ft NGVD 29 and Rocky Reach dam flow at 100 kcfs.

Supporting GIS Datasets:

- NHC_PLFLX_Metric1A_Inundation_Bndry_RID613FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric1B_DepthRaster_RID613FT_RRD100kcfs_20230504

Metric 2 - Usable Storage

Definition: Difference in project storage at minimum and maximum Rock Island forebay stages of 609.0 and 613.0 ft NGVD 29, respectively, and Rocky Reach dam flow is 100 kcfs.

Calculation Method: Subtract the product of the simulated inundation area and mean pool depth when Rock Island forebay is at elevation 613 ft NGVD 29 from the product of the simulated inundation area and mean pool depth when Rock Island forebay is at elevation 609 ft NGVD 29, both corresponding to a Rocky Reach discharge of 100 kcfs.

Supporting GIS Datasets:

- NHC_PLFLX_Metric1A_Inundation_Bndry_RID613FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric1B_DepthRaster_RID613FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric2C_Inundation_Bndry_RID609FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric2D_DepthRaster_RID609FT_RRD100kcfs_20230504

Metric 3 - Area of Reservoir

Definition: Area of Rock Island mainstem pool when Rock Island forebay is at elevation 613 ft NGVD 29, and Rocky Reach flows are at 100 kcfs.

Calculation Method: Calculate the area of the inundation polygon corresponding to simulated inundation when Rock Island forebay is at elevation 613 ft NGVD 29, and Rocky Reach flows are at 100 kcfs.

Supporting GIS Datasets:

- NHC_PLFLX_Metric1A_Inundation_Bndry_RID613FT_RRD100kcfs_20230504

Metric 4 - Maximum Length of Reservoir

Definition: Length of reservoir (dam face to dam face)

Calculation Method: Calculated using the thalweg polyline delineated and provided by Chelan PUD after clipping endpoints to the downstream face of Rocky Reach dam and the upstream face of Rock Island dam.

Supporting GIS Datasets:

- NHC_PLFLX_Metric4_Centerline_dam_to_dam_20230504

Metric 5 - Shoreline Perimeter

Definition: Shoreline length corresponding to Rock Island forebay stage of 612 ft NGVD 29 and Rocky Reach dam flow of 100 kcfs.

Calculation Method: Measured polyline length from exported inundation boundary output from model simulation with Rock Island forebay at a stage of 612 ft NGVD 29 and Rocky Reach dam flow of 100 kcfs.

Supporting GIS Datasets:

- NHC_PLFLX_Metric5A_Inundation_Bndry_RID612FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric5B_Bndry_Polyline_RID609FT_RRD100kcfs_20230504

Metric 6 - Average Width of Reservoir

Definition: Average width of the reservoir when Rock Island forebay is at elevation 612 ft NGVD 29 and Rocky Reach dam flow is 100 kcfs.

Calculation Method: Calculated by dividing the simulated inundated area from model simulation with Rock Island forebay at a stage of 612 ft NGVD 29 and Rocky Reach dam flow of 100 kcfs by the measured maximum length of reservoir (i.e., Metric 4).

Supporting GIS Datasets:

- NHC_PLFLX_Metric5A_Inundation_Bndry_RID612FT_RRD100kcfs_20230504

- NHC_PLFLX_Metric4_Centerline_dam_to_dam_20230504

Metric 7 - Maximum Depth

Definition: Maximum reservoir depth when Rock Island forebay stage is at elevation 612 ft NGVD 29 and Rocky Reach dam flow is 100kcfs.

Calculation Method: Query maximum depth from the output generated by model simulation with Rock Island forebay stage at elevation 612 ft NGVD 29 and Rocky Reach dam flow as 100 kcfs.

Supporting GIS Datasets:

- NHC_PLFLX_Metric7_DepthRaster_RID612FT_RRD100kcfs_20230504

Metric 8 - August Average Water Particle Travel

Definition: Average water travel/speed when the flow from Rocky Reach dam is 100 kcfs, and Rock Island dam forebay elevation is 612 ft NGVD 29.

Calculation Method: Divide discharge at Rocky Reach dam (100 kcfs) by the average cross-sectional area of the reservoir. Average cross-sectional area is calculated as the ratio of total storage volume, as calculated from a depth raster output from a model simulation where Rocky Reach dam is 100 kcfs, and Rock Island dam forebay elevation is 612 ft NGVD 29, by the maximum length of reservoir (Metric 4).

Supporting GIS Datasets:

- NHC_PLFLX_Metric7_DepthRaster_RID612FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric4_Centerline_dam_to_dam_20230504

Listing of GIS Datasets Used for Technical Information Metric Calculations

The GIS feature datasets have been provided as documentation of the technical information metric calculations described above. All data is included in the geodatabase "RI_OPS_PLFLX_QC3_ResPoolMetrics_NHC_20230504.gdb."

- NHC_PLFLX_Metric1A_Inundation_Bndry_RID613FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric1B_DepthRaster_RID613FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric2C_Inundation_Bndry_RID609FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric2D_DepthRaster_RID609FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric4_Centerline_dam_to_dam_20230504
- NHC_PLFLX_Metric5A_Inundation_Bndry_RID612FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric5B_Bndry_Polyline_RID609FT_RRD100kcfs_20230504
- NHC_PLFLX_Metric7_DepthRaster_RID612FT_RRD100kcfs_20230504
- CCPUD_RIThalweg_20220929
- CCPUD_RI_RM_Pts_from_RIThalweg_20220929

E.2 PACIFIC LAMPREY SUPPLEMENTAL

TECHNICAL MEMO

To: Public Utility District No. 1 of Chelan County
327 N. Wenatchee Avenue
Wenatchee, WA 98801

From: Four Peaks Environmental Science & Data Solutions

Date: August 2023

Re: Pacific Lamprey Supplemental Information

ROCK ISLAND HYDROELECTRIC PROJECT
FERC NO. 943

1.0 INTRODUCTION

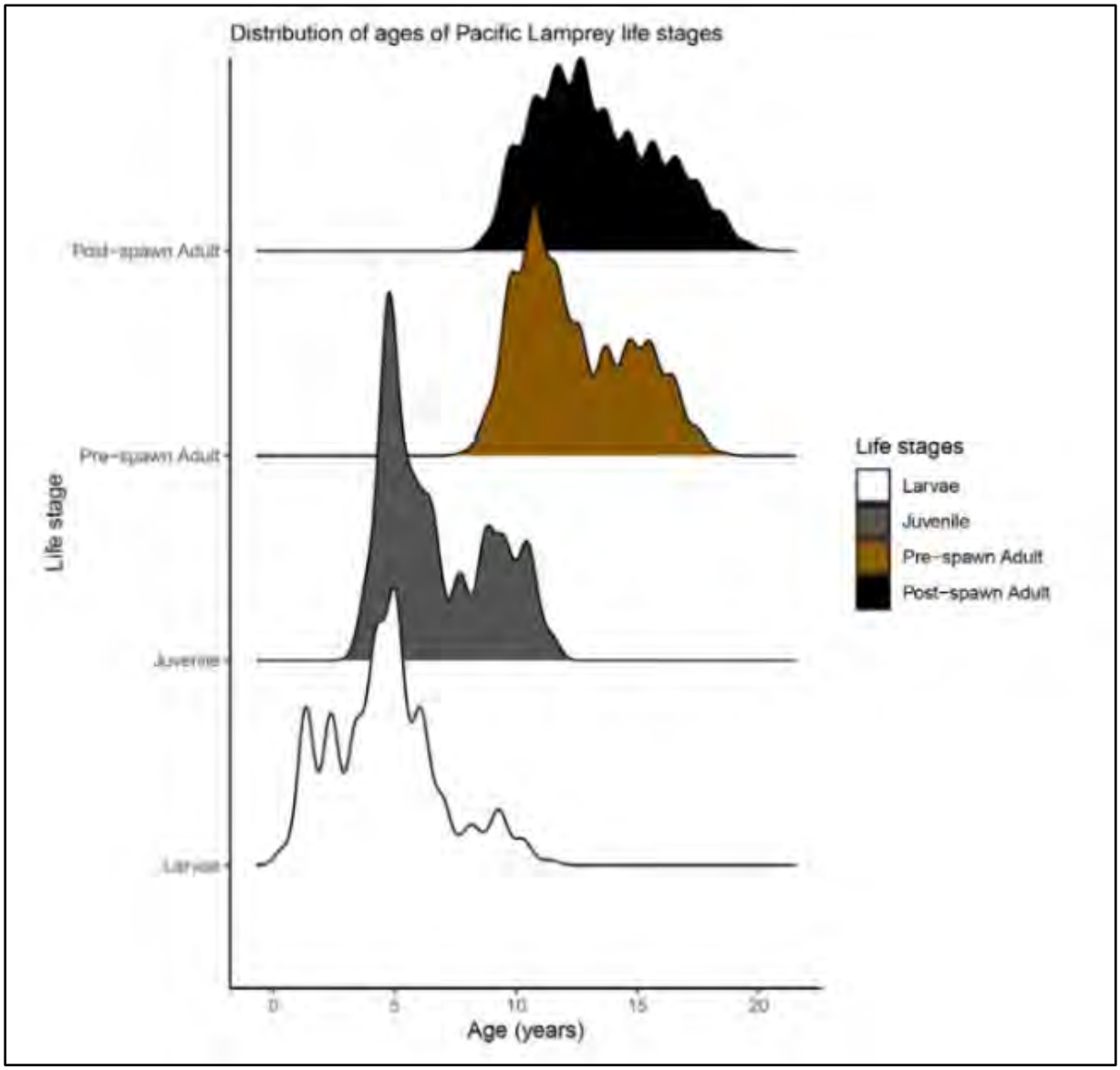
The purpose of this technical memorandum is to provide additional details on Pacific Lamprey (*Entosphenus tridentatus*) life history and provide the newest available reports and unpublished data related to the ecology, behavior, and abundance of Pacific Lamprey throughout their range and in the vicinity of the Rock Island Project. The information presented here is intended to supplement the information provided in the Pre-Application Document for the Rock Island Project.

2.0 PACIFIC LAMPREY LIFE HISTORY

Pacific Lamprey play an important role in both freshwater and marine ecosystems and are a culturally important species for several Tribes in the Pacific Northwest (Orlov et al. 2008; Clemens et al. 2017). Pacific Lamprey reach up to 18 years of age, including a highly variable time in freshwater (3 to 11 years) and at sea (3 to 7 years; Figure 1; Hess et al. 2022). Lamprey species are known for high plasticity in life history strategies, evidenced by a fossil record dating beyond 300 million years (Chang et al. 2006).

Juvenile Pacific Lamprey reside as microphagous-feeding larvae (ammocoetes) burrowed in fine sediments in shallow backwaters of streams (Beamish and Levings 1991; Clemens et al. 2017). Habitat selection appears to be based on availability of fine sediments, suitable hydraulic conditions, canopy cover, and proximity to spawning areas. Ammocoetes feed on algae, bacteria, and detritus by filtering detritus and organic material from interstitial spaces in their burrows, growing to 4.7 in. (1.20 cm) in total length and weighing 0.1 ounces (3 grams) (McGree et al. 2008; Jolley et al. 2015). Ammocoetes drift downstream at night or during periods of high flow but are frequently found in mixed age-class colonies in high densities (White and Harvey 2003; Hess et al. 2021).

Between 3 and 11 years of age, ammocoetes undergo a transformation to prepare for seaward migration (Beamish and Levings 1991; Hess et al. 2022). Their organ systems undergo a true metamorphosis, with significant changes to the mouth, eyes, branchial region, and digestive system in preparation for the downstream migration to forage in the marine environment as ectoparasites (McGree et al. 2008; Manzon et al. 2015; Clemens 2019). The metamorphosed juveniles, known as transformers or macrophthalmia (Clemens 2019), begin their seaward migration in conjunction with spring flows and freshets over a period that spans from March to July (Beamish and Levings 1991; Goodman et al. 2015). The ability to osmoregulate and feed on a variety of host species is fully formed by the time the transformers reach the ocean (Goodman et al. 2015; Manzon et al. 2015). Juvenile lampreys are preyed upon by native and non-native fishes and birds during their outmigration (Arakawa and Lampman 2020; Arakawa et al. 2021).



Hess et al. 2022

Figure 1. Distribution of Estimated Age (Years) for Each Life Stage of Snake River Pacific Lamprey.

Pacific Lamprey feed on a variety of hosts in the ocean that range in both size and abundance over a broad geographic range (Orlov et al. 2008; Murauskas et al. 2019). Like the Great Lakes, where adult Sea Lamprey (*Petromyzon marinus*) abundance was found to be a direct result of prey availability for recently transformed juveniles (Young et al. 1996), Pacific Lamprey abundance in the Columbia River Basin is highly correlated with the abundance of key host species. The annual biomass of Pacific Hake (*Merluccius productus*), Walleye Pollock (*Gadus chalcogrammus*), Pacific Cod (*G. macrocephalus*), Chinook Salmon (*Oncorhynchus tshawytscha*), and Pacific Herring (*Clupea pallasii*) accounts for up to 92 percent of the variation in adult Pacific Lamprey abundance in the

Columbia River (Murauskas et al. 2013). Similar research found that Pacific Lamprey abundance is closely related to the abundance of their preferred prey in the Canadian Strait of Georgia (Wade and Beamish 2016). The relationship with common hosts in the marine environment may explain the nearly identical trends in Pacific Lamprey abundance observed in the Columbia River, the Nass River (Canada), and coastal Russia, all of which have shown population declines (Murauskas et al. 2016).

Unlike Pacific salmon species, Pacific Lamprey do not return home to natal river basins to reproduce but locate suitable rivers using chemical cues from ammocoetes (Spice et al. 2012; Moser et al. 2015a). The lack of natal stream fidelity in parasitic lampreys was first documented in Lake Huron, where 555 Sea Lamprey transformers were tagged and released during the outmigration; none of the 42 adult recoveries were observed in their natal tributary (Bergstedt and Seelye 1995). These findings supported research related to steroidal pheromones released by stream-dwelling larval lamprey that attract adult lampreys (Sorensen et al. 2005). Further research on Pacific Lamprey indicate that they, too, employ a chemical communication system that guides adults to suitable spawning habitats (Robinson et al. 2009; Yun et al. 2011). Despite the lack of homing, there is evidence rejecting complete panmixia (random mating), potentially a result of limited dispersal of lampreys in broader geographic regions (Spice et al. 2012; Hess et al. 2022).

The Pacific Lamprey adult freshwater migration is complex, with life history traits described in at least three dichotomies, which may not be mutually exclusive: (1) ocean- or stream-maturing, indicating whether gonad maturation begins prior to freshwater or not, respectively; (2) “day eels” and “night eels,” which is Tribal terminology that describes smaller, lighter colored lampreys versus larger and darker lampreys, respectively; and (3) normal and dwarf, with the latter describing mature lampreys with a relatively smaller body size that spawn at a different time within the same season compared to the more frequently observed normal life history strategy (Clemens et al. 2013, 2019). The size of adult Pacific Lamprey is more predictive of upstream passage and movements than river discharge, temperature, or migratory timing (Keefer et al. 2009; Hess et al. 2014).

The spawning migration may begin throughout the year, though timing is highly variable throughout their range (Clemens et al. 2019). In the Columbia River Basin, the majority (80 percent) of adult Pacific Lamprey pass Bonneville Dam at river mile (RM) 146 (river kilometer 235) over a period of 66 days centered on July 12 (based on count data from 2012 to 2021; DART 2022). In comparison, most adult Pacific Lamprey pass Rock Island Dam at RM 453 (river kilometer 730) over a period of 45 days centered around August 23 (DART 2022). Adults typically overwinter for one year prior to spawning the following spring, though some adults overwinter for two years, relying on stored energy (Whyte et al. 1993; Clemens et al. 2013; Hess et al. 2022). Migratory

speeds and conversion rates also vary throughout the Columbia River, with rapid, successful migrations in reservoir reaches (31-38.5 miles/day [50-62 km/day], 93-99 percent conversion) and slow movements in tailraces and fishways (0.6-1.9 miles/day [1-3 km/day], 58-82 percent conversion; Keefer et al. 2020). In most years, 4-8 percent of the adult Pacific Lamprey enumerated at Bonneville Dam are observed at Rock Island Dam (DART 2022).

Spawning season for Pacific Lamprey in the Columbia River Basin occurs between April and June (Beamish 1980; Brumo et al. 2009). Spawning activity occurs in rivers, streams, and especially riffle habitat when water temperatures increase to levels that coincide with optimal embryonic development. Adults move stones with their oral disks to create nests and fan sediment using their tails (Johnson et al. 2015). Larger individuals typically spawn in deeper water with higher flow and larger gravel compared to smaller individuals (Stone 2006; Johnson et al. 2015). Pacific Lamprey are polygynandrous (multiple males spawn with multiple females), often spawning in groups of two to four. Male and female lampreys entwine and simultaneously release gametes; fecundity is often above 125,000 eggs (Clemens et al. 2013; Johnson et al. 2015). Eggs generally hatch within two weeks, though embryonic development varies by water temperature (Yamazaki et al. 2003). After spawning, adult lamprey typically die within a few days (Clemens et al. 2013).

3.0 STATUS

Pacific Lamprey abundance in the Columbia River is monitored in fishways at hydroelectric projects. Despite undercounting at night when some count windows are not monitored, undocumented passage routes, mixed brood years, and milling behavior, fishway counts offer the best available representation of trends in Pacific Lamprey abundance in the Pacific Northwest (Clabough et al. 2012; Murauskas et al. 2016). The first 13 years of Pacific Lamprey counts at Bonneville Dam (1946-1958) averaged 62,322 adults, followed by a 370 percent increase to 364,805 adults by 1961 (DART 2022). Annual counts then decreased to 66,171 adults by 1967 prior to the 1969 record return of 379,509 adults. Counts of Pacific Lamprey were stopped at Bonneville Dam, and no data were collected for nearly three decades. Pacific Lamprey counts resumed at Bonneville Dam in 1999, and efforts were initiated at multiple other projects, including Rock Island Dam, by 2000 (Figure 2). Since 1999, Pacific Lamprey counts at Bonneville Dam have averaged 37,486 adults (range 6,234 to 117,029).

While peak counts over the last two decades have exceeded several years prior to the 1950s, Pacific Lamprey counts in the 21st century have yet to reach peak levels observed in the mid-1900s or those reflected in historical records. The recent peaks in Pacific Lamprey abundance are encouraging but are less than a third of historical peaks and suggestive of a highly variable but general decline in Pacific Lamprey abundance in the Columbia River Basin.

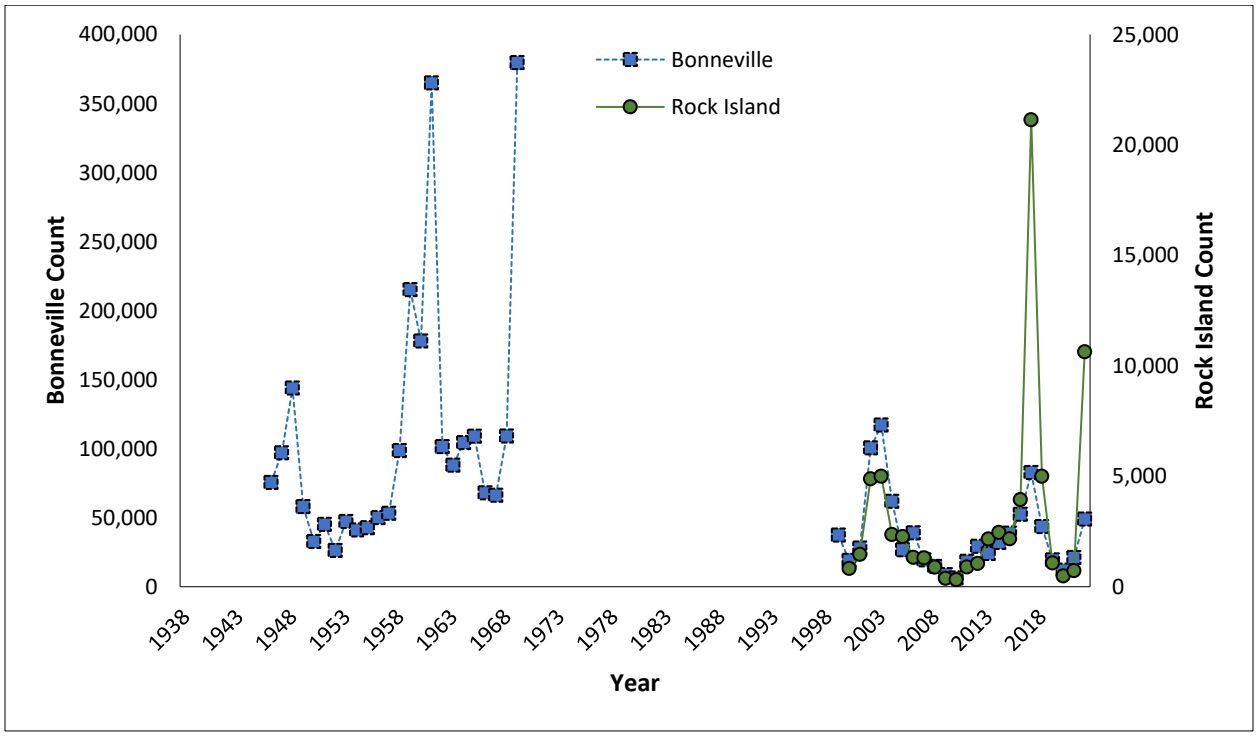


Figure 2. Annual Counts of Adult Pacific Lamprey at the Bonneville and Rock Island Hydroelectric Project Fishways, 1946 to 2022

Adult Pacific Lamprey counts at Rock Island Dam date back to 2000. Counts have averaged 3,160 adults (range 318 to 21,137) over the last 22 years and show a general increase due to the relatively high returns observed in 2017 and 2022 (Figure 2). Counts of Pacific Lamprey at Rock Island Dam are correlated to those at Bonneville Dam ($r = 0.59$, $p < 0.001$), typically representing a conversion rate of 4 to 8 percent. This relationship becomes less evident in years with above-average returns, such as the record observed in 2017, when 26 percent of Pacific Lamprey enumerated at Bonneville Dam converted to Rock Island Dam. Median run timing at Rock Island Dam is typically six or more weeks after Bonneville Dam and occurs as river temperatures begin to decrease into fall months and fish prepare to overwinter (Keefer et al. 2020; DART 2022).

Pacific Lamprey's presence is well-documented in the Columbia River and tributaries above Rock Island Dam, including the Wenatchee, Entiat, and Methow rivers (Luzier et al. 2011). Pacific Lamprey were last documented in the Okanogan River in 2010 and presumed to be extirpated until successful translocation efforts began in 2017 (Laramie 2022). While robust rigorous monitoring approaches are lacking beyond fishway counts, population size in the Upper Columbia River has been estimated to be greatest in the Wenatchee and Entiat rivers (250-1,000 adults with a stable short-term trend in abundance), followed by the Methow River, with 50-250 adults and a 30-50 percent decreasing short-term trend, and the Okanogan River, with 1-50 adults and a greater than 70 percent decreasing short-term trend (USFWS 2019). Current and historic

occupancy for the Chelan River (a tributary with less than 1 mile of river below a natural passage barrier) is unknown, and few lampreys likely used the Similkameen River (USFWS 2019).

Data on juvenile lampreys are also available at sampling locations and rotary screw traps operated to monitor juvenile salmonids. At the Rock Island Dam juvenile sampling facility, Pacific Lamprey abundance has averaged 75 juveniles annually over the last decade (2013-2022). However, no observations were recorded over the most recent five years (Figure 3; DART 2022). Rotary screw trap collections of Pacific Lamprey in the Upper Columbia River are also negligible: no ammocoetes or transformers have been recorded at the Chiwawa River, lower and upper Entiat River, Nason Creek, Okanogan River, Peshastin River, and Wenatchee River locations at Monitor and above the Chiwawa River confluence throughout their operations (DART 2022). While some of these locations were only operated for a short period or lamprey observations were not adequately documented, data from other locations confirm that collecting juveniles using traditional approaches is not pragmatic. At the Lower Wenatchee trap between 2013 and 2015, average daily observations of juvenile or larval Pacific Lamprey were 0.03 and 1.35 fish, with the maximum daily catch of 3 and 64 fish, respectively (DART 2022). The Methow River trap (2013-2020) has average daily observations of juvenile and larval Pacific Lamprey of 0.17 and 1.22 fish, with the maximum daily catch of 116 and 124, respectively (Figure 4). Observations of ammocoetes in Upper Columbia River rotary screw traps typically peak in late May, but often extend from March to August with outliers beyond those months. Observations of juvenile lampreys are greatest in April and May, with no observations in the summer months and an increase of observations from September to November.

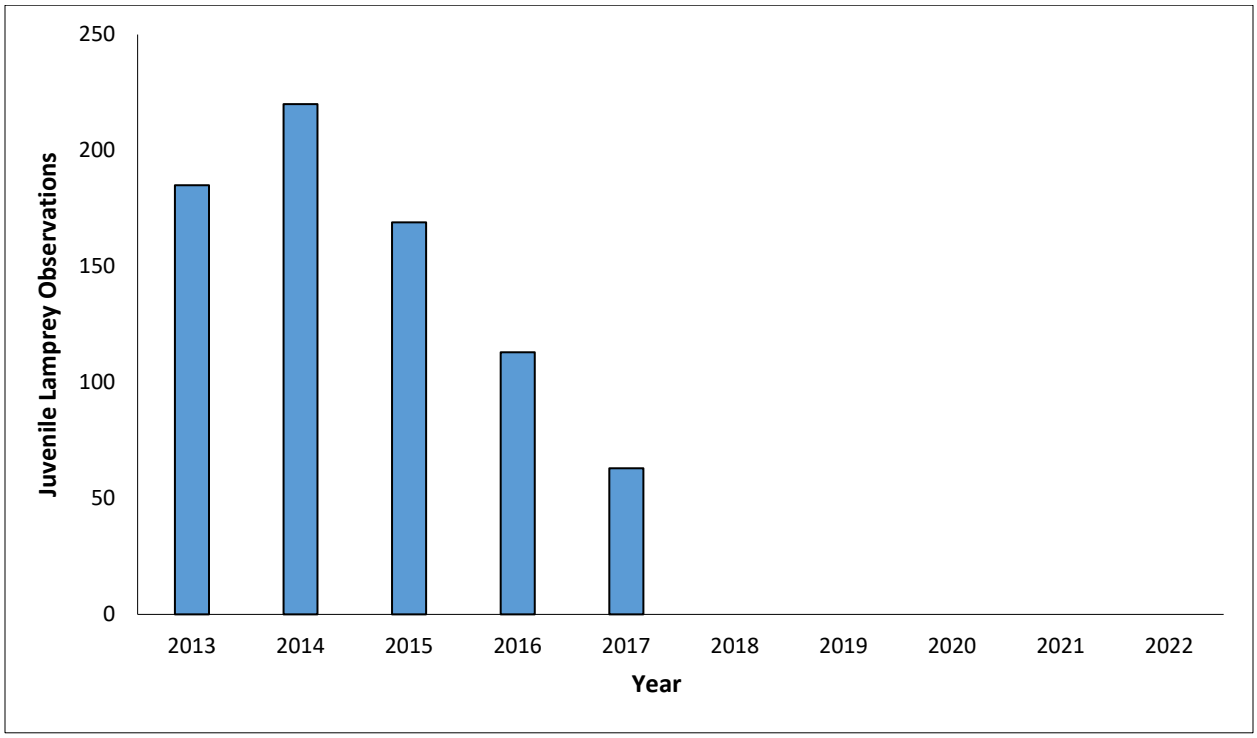


Figure 3. Observations of Juvenile Pacific Lamprey at Rock Island Dam, 2013 to 2022

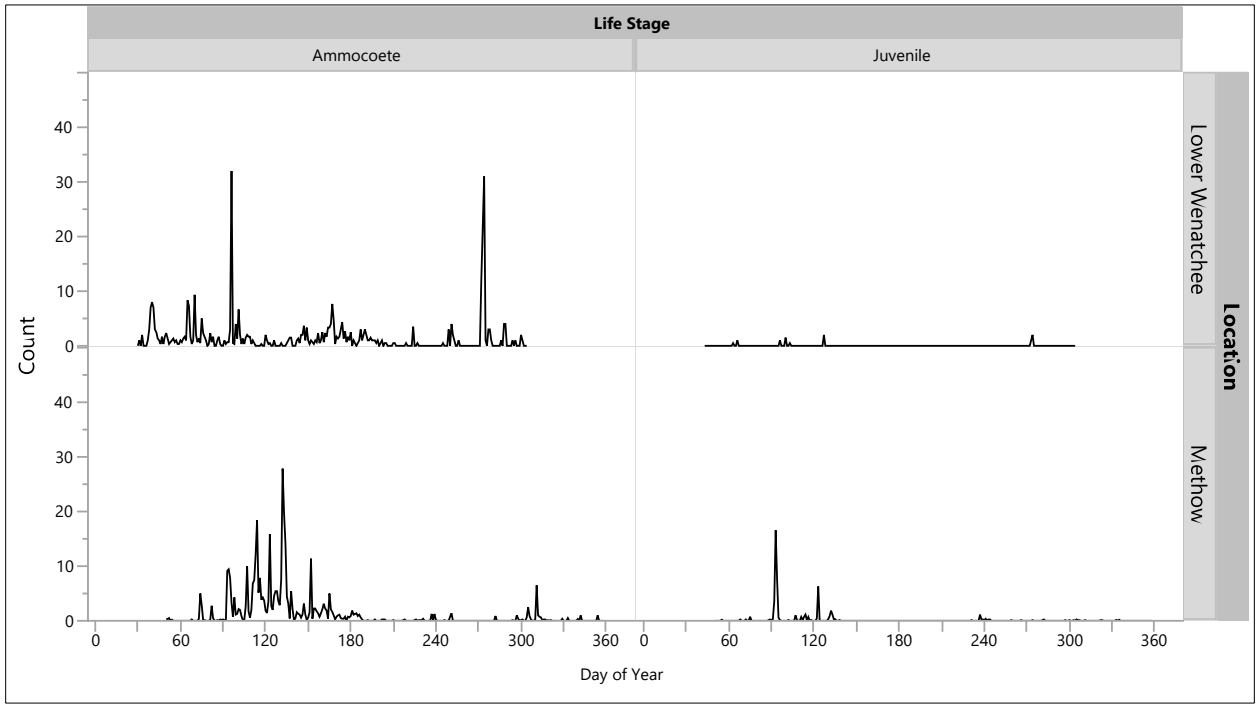


Figure 4. Mean Daily Counts of Pacific Lamprey Ammocoetes and Juveniles in the Rotary Screw Traps of Lower Wenatchee River (2013 to 2015) and Methow River (2013 to 2020)

4.0 LIMITING FACTORS

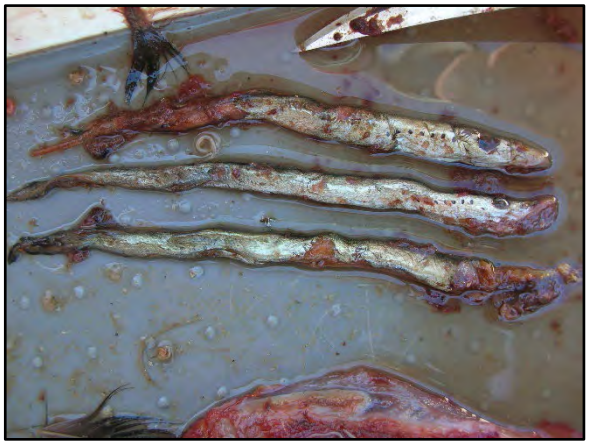
Several researchers have documented and summarized factors that limit Pacific Lamprey abundance in freshwater systems. Aside from threats that lack clear management solutions (e.g., predation, disease, and climate change) or those no longer in practice (e.g., poisoning by rotenone), most research and management on Pacific Lamprey is focused on passage barriers, habitat loss or alterations, and environmental conditions. Passage barriers include irrigation, flood control, and hydroelectric dams—many of which lack fishways—water diversions, screens, culverts, and other anthropogenic structures that obstruct or delay migration (Luzier et al. 2011; Clemens et al. 2017). Some of these structures, such as submerged bar screens at juvenile salmon bypass systems, can potentially inflict injury or death to juvenile lampreys (Moursund et al. 2003). Habitat and environmental conditions known to affect Pacific Lamprey include reduced stream complexity, increased water temperatures, flow alterations, water quality, toxics, dewatering, dredging and excavation, and loss of fine sediment (Luzier et al. 2011; Clemens et al. 2017). Factors most relevant to the Rock Island Hydroelectric Project include the passage of juvenile and adult lampreys during seaward and spawning migrations.

Upstream passage of adult Pacific Lamprey has been assessed at multiple mainstem Columbia River hydroelectric projects since 1997 (e.g., Moser et al. 2002a, 2002b; Keefer et al. 2009, 2013, 2020). Pacific Lamprey are anguilliform swimmers, often relying on 'burst and attach' movements, velocity refuges, and even climbing of wetted surfaces when available. Because of these behavioral traits, steps, and sharp edges, grating or picketed leads, and areas of velocity exceeding the swimming speed of lampreys that are common to many fishways can delay or obstruct passage (Keefer et al. 2010, 2011). In addition to dozens of evaluations at 11 Columbia and Snake River hydroelectric projects (Le et al. 2020), various assessments of lamprey behavior have been conducted to better understand performance across a range of physical conditions (Mesa et al. 2003; Daigle et al. 2008; Keefer et al. 2010, 2011; Kirk et al. 2015; Goodman and Reid 2017). No passage evaluations have been conducted at Rock Island Dam. However, at least 34 evaluations have demonstrated that results are highly variable (less than 10 percent to 100 percent) based on location, characteristics of study fish, timing, and fishway design. Median fishway passage rates for adult Pacific Lamprey are likely at approximately 70 percent across all facilities tested (Le et al. 2020). Because of low upstream conversion rates relative to Pacific salmon, particularly in the lower Columbia River, managers have identified fishway passage as a priority in Pacific Lamprey restoration efforts (CRITFC 2011; Luzier et al. 2011).

Downstream passage of juvenile Pacific Lamprey through Columbia River hydroelectric projects can be affected by physical, operational, and ecological conditions (Moser et al. 2015b). Submerged screens have been identified as the most problematic physical structure at dams, given

the low burst swimming capability of juvenile lampreys (mean of 71 cm s−1; Dauble et al. 2006). Mortality rates can be high for juveniles wedged in screens, particularly at deeper locations with bar spacing conducive to impingement (Moursund et al. 2003). In contrast, juvenile lampreys, which lack a swim bladder, paired fins, cycloid scales, gill plates, and other boney structures found in teleosts, can withstand conditions in spillways and turbines known to injure or kill most juvenile salmonids (Moser et al. 2015b). For example, rapid pressure changes experienced during turbine passage that would inflict a 98 percent mortality rate in juvenile Chinook Salmon did not result in any mortality or evidence of barotrauma in Pacific Lamprey under rigorous laboratory testing (Colotelo et al. 2012). The lack of effect from turbine passage has been documented in other lamprey species, including a 0.0 percent acute turbine mortality estimate for juvenile Sea Lamprey (Gibson and Meyers 2002).

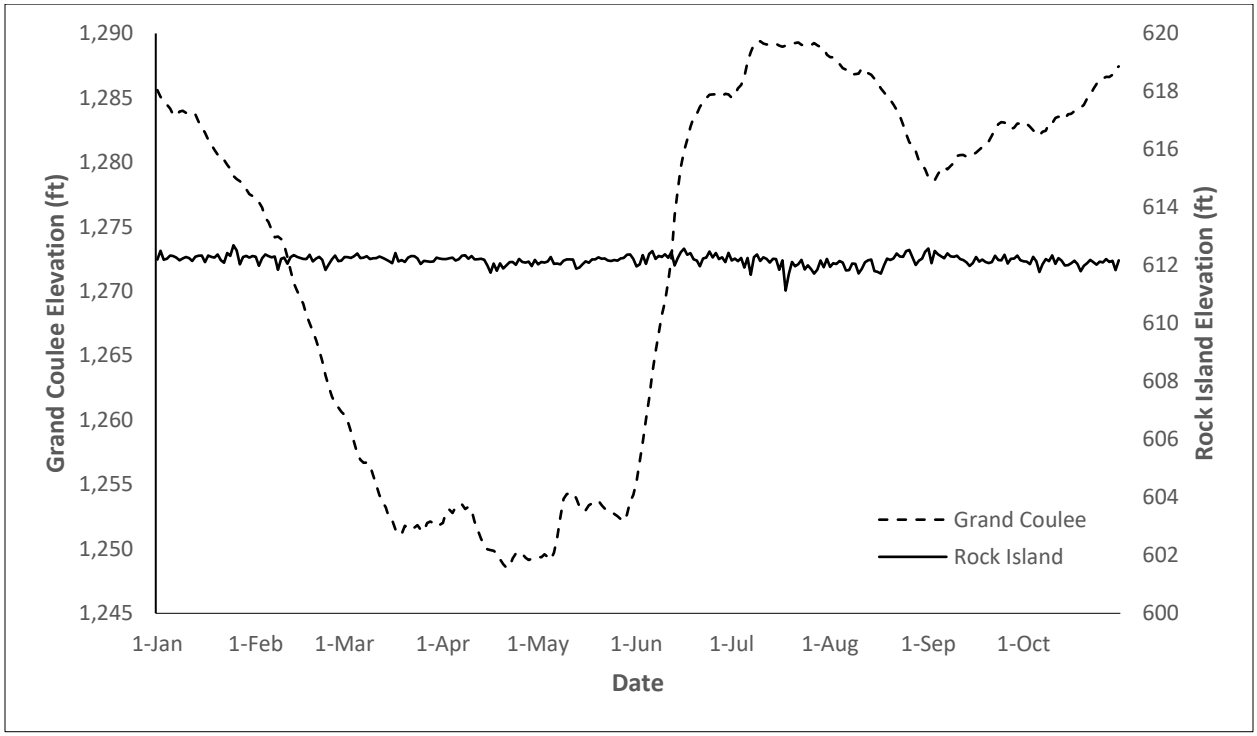
Predation is a changing source of Pacific Lamprey mortality at hydroelectric projects. Research has demonstrated that both invasive (e.g., Smallmouth Bass [*Micropterus dolomieu]* and Common Carp [*Cyprinus carpio]*) and native (e.g., Northern Pikeminnow [*Ptychocheilus oregonensis*] and White Sturgeon [*Acipenser transmontanus*]) fishes can successfully prey on lampreys under appropriate conditions (Arakawa and Lampman 2020; Arakawa et al. 2021). A study upstream of Rock Island Dam (Wells Dam) examined over 1,000 fishes and 11 birds and found only seven predated juvenile lampreys in five predators, including three Northern Pikeminnow, one Double-crested Cormorant (*Phalacrocorax auritus*), and one Ring-billed Gull (*Larus delawarensis*) (Photo 1). No lampreys were collected from Smallmouth Bass, Walleye (*Stizostedion vitreum*), Caspian Tern (*Hydroprogne caspia*), or California Gull (*Larus californicus*) (Douglas PUD and LGL 2008). Other researchers have looked for methods to overcome the potential bias in gut content analysis due to digestion rates and the lack of hard structures, such as bones and scales, in lampreys (Arakawa et al. 2021). Predation on adult lampreys is also significant in some systems: research in Europe found that 80 percent of tagged adult Sea Lamprey were preyed upon by catfish within one month of release in freshwater (Boulêtreau et al. 2020). With increasing populations of White Sturgeon and non-native fishes in the Upper Columbia River, predation may explain low conversion rates of adult lampreys in some cases through either mortality or avoidance behavior through alarm cues (Imre et al. 2016).



Source: B. Patterson 2008

Photo 1. Juvenile Lampreys Collected From a Double-crested Cormorant Stomach

Reservoir fluctuations have been suspected to affect juvenile lampreys through trapping and stranding (Liedtke et al. 2015), although the morphology and physiology of lampreys are drastically different than teleosts such as Pacific salmon. For example, Pouched Lamprey (*Geotria australis*) ammocoetes can survive, without apparent discomfort, in moistened gauze for four days at 10, 15, and 20°C (Potter et al. 1996). Research on Pacific Lamprey are consistent with these findings, though it shows that prolonged dewatering periods can be a source of mortality. Under laboratory evaluations, very limited mortality in juvenile Pacific Lamprey was found for dewatered periods of less than 24 hours, though significantly increased at 24, 36, and 48 hours of exposure to dewatered habitat (Liedtke et al. 2015). Field evaluations have confirmed that extended dewatering events (greater than 24 hours) can cause significant mortality, though downslope movements to watered habitat and predation confound interpretations of escapement versus desiccation or predation (Harris et al. 2020). No research on trapping and stranding of juvenile Pacific Lamprey has been conducted in the Upper Columbia River. However, the Rock Island Project reservoir fluctuates little compared to larger storage projects such as Grand Coulee Dam (Figure 5; DART 2022).



Note: differing scale of Y axes.

Figure 5. Forebay Elevation in 2022 (Through October 31) at Grand Coulee and Rock Island Hydroelectric Projects to Contrast Annual Drawdowns in a Storage vs. Run of River Project, Respectively

5.0 MANAGEMENT

Conservation efforts for Pacific Lamprey were established in the 1990s following population declines and increased awareness of their ecological and cultural importance in the Pacific Northwest. Oregon listed Pacific Lamprey as a sensitive species in 1993, and a status report was developed for the Columbia River Basin in conjunction with the formation of the Columbia River Basin Lamprey Technical Workgroup in 1995. A petition to list Pacific Lamprey under the Endangered Species Act was submitted to the United States Fish and Wildlife Service (USFWS) in 2003, though listing did not occur due to insufficient information on the biology, ecological needs, and particular threats to lampreys (Clemens et al. 2017). However, Pacific Lamprey were listed as endangered in Idaho (2006) and at risk of extinction in Oregon (2006). The Columbia River Inter-Tribal Fisheries Commission developed the Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin in 2011 (CRITFC 2011), concurrent with the USFWS' Pacific Lamprey Assessment and Template for Conservation Measures (Luzier et al. 2011).

The mid-Columbia River Public Utility Districts (PUDs) were among the first entities to develop management Plans for Pacific Lamprey as part of relicensing efforts throughout the region. The Rocky Reach Hydroelectric Project Pacific Lamprey Management Plan was developed in 2006, followed by similar plans for the Priest Rapids Hydroelectric Project (2008) and the Wells Hydroelectric Project (2009; Clemens et al. 2017). Each Pacific Lamprey Management Plan addresses key components relating to potential project-related effects on Pacific Lamprey within the respective project area, generally focused on upstream passage of adults, downstream passage of juveniles, and reservoir operations (Chelan PUD 2006). The Pacific Lamprey Management Plans are currently being implemented at Rocky Reach, Wells, and Priest Rapids Hydroelectric Projects. Among the most successful strategies are the translocation efforts coordinated through PUD, state, federal, and Tribal biologists (Table 1). Lengthy monitoring efforts in other parts of the Columbia River Basin have demonstrated that translocation improves spatial structure and productivity of Pacific Lamprey in interior habitats of the Columbia River Basin (Hess et al. 2022). Efforts in the Mid-Columbia River have bolstered the number of adult Pacific Lamprey in the Wenatchee, Methow, Okanogan, and Yakima River basins.

Table 1. Summary of Adult Pacific Lamprey Translocations between 2011 and 2018

WATERSHED	TRANSLOCATION YEARS	YAKAMA NATION FISHERIES	USFWS	DPUD
Wenatchee	2016-2018	793	0	0
Methow	2015-2018	704	0	0
Okanogan	2017-2018	0	0	389
Upper Yakima	2013-2018	162	45	0

WATERSHED	TRANSLOCATION YEARS	YAKAMA NATION FISHERIES	USFWS	DPUD
Lower Yakima	2011-2018	2214	164	0

Source: Grote et al. 2018

6.0 REFERENCES

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E.3 BULL TROUT SUPPLEMENTAL

TECHNICAL MEMO

To: Public Utility District No. 1 of Chelan County
327 N. Wenatchee Avenue
Wenatchee, WA 98801

From: Four Peaks Environmental Science & Data Solutions

Date: August 2023

Re: Supplemental Bull Trout Information

ROCK ISLAND HYDROELECTRIC PROJECT
FERC NO. 943

1.0 INTRODUCTION

The purpose of this technical memorandum is to compile and consolidate recently available reports and unpublished data related to the ecology, behavior, and abundance of Bull Trout (*Salvelinus confluentus*) in the vicinity of the Rock Island Project. The data used in the memorandum were drawn from a variety of publicly available sources including the University of Washington's Columbia Basin Research Columbia River Data Access in Real Time (DART) website[1], Pacific States Marine Fisheries Commission's PIT Tag Information System (PTAGIS) website[2], United States Geological Survey (USGS) gages[3], and the Washington State Department of Fish and Wildlife's (WDFW) Salmonid Conservation and Reporting Engine (SCoRE)[4]. In addition, data from Public Utility District Number 1 of Chelan County (Chelan PUD) fisheries monitoring and evaluation activities are also presented. The memorandum focuses on Bull Trout movement, migration patterns, and population abundance trends.

2.0 MOVEMENT AND MIGRATION PATTERNS

2.1 MAINSTEM COLUMBIA RIVER

Bull Trout movements and use of mainstem Columbia River habitats in the Rock Island Project area have been documented through Chelan PUD's implementation of the Rock Island and Rocky Reach Bull Trout Management Plans (BTMP; i.e., Rock Island BTMP, Chelan PUD 2005; and Rocky Reach BTMP, 2006), the Rock Island Habitat Conservation Plan (HCP; Chelan PUD 2002), and other regional studies. These efforts have generated several data sources further analyzed here, including visual fish counts and Passive Integrated Transponder (PIT) tag detections.

2.1.1 Methods

2.1.1.1 Visual Counts

Chelan PUD has conducted annual visual counts of Bull Trout and other fish species transiting the three fishways at Rock Island Dam. In most years, visual counts occurred from April 15 through November 15, as required in the Rock Island HCP (Chelan PUD 2002). In 2007, as part of the Rock Island BTMP, Chelan PUD extended the counting window to include the period of January 1 to

[1] https://www.cbr.washington.edu/dart/query/adult_graph_text
[2] https://dashboard.ptagis.org/
[3] https://waterdata.usgs.gov/nwis/rt
[4] https://fortress.wa.gov/dfw/score/score/species/bulltrout.jsp?species=Bulltrout

April 14. Although Rocky Reach is not the focus of relicensing, Bull Trout passage numbers from Rocky Reach reflect Bull Trout moving out of the Rock Island Project and are summarized in this memorandum. Rocky Reach visual counts occur at a single adult fishway operated between April 15 through November 15 annually. Visual count data from both projects are uploaded to DART and are publicly available. The visual count data used in this memorandum were obtained from DART and analyzed to determine annual passage numbers and seasonal and diel passage timing at the Rock Island Adult Fishway.

2.1.1.2 PIT Detections

As part of the Rock Island and Rocky Reach BTMPs, Chelan PUD conducted a PIT-tag analysis to evaluate Bull Trout interactions with Chelan PUD's hydroelectric projects and fish passage infrastructure (Chelan PUD 2019; Four Peaks 2022). This PIT-tag analysis included enumerating detections at the Rock Island and Rocky Reach Adult Fishways between 2008 and 2022 using the Pacific States Marine Fisheries Commission's PTAGIS databases and website. Queries from PTAGIS were used to determine seasonal passage trends at the Rock Island and Rocky Reach Adult Fishways, and to classify Bull Trout as adults (greater than 12 in. [3.05 cm]) or subadults (less than or equal to 12 in. [3.05 cm]) at the time of detection at Rock Island. Bull Trout size and subsequent classification as adult or subadult were calculated using growth estimates derived from the reported lengths of individuals at the time of marking and later at recapture. In addition, PTAGIS queries were used to determine the tributary origin and duration between PIT tagging and subsequent detection of Bull Trout interactions with Chelan PUD facilities and infrastructure (Four Peaks 2022).

2.1.2 Results

During the 21-year period following the implementation of the Rock Island HCP (Chelan PUD 2002; 2002 to 2022), a total of 1,175 Bull Trout have been visually counted (DART 2023) at the Rock Island Adult Fishways by Chelan PUD. The average annual count has been 56 Bull Trout, with a maximum count of 121 in 2013, and a minimum count of 19 in 2018 (DART 2023). Counts have typically occurred from April 15 through November 15 in compliance with the Rock Island HCP. However, in 2007, Chelan PUD extended the visual count period to include January 1 to April 14 to determine if Bull Trout passage events occurred in the winter and early spring as specified by the Rock Island BTMP (Chelan PUD 2005). No Bull Trout were observed in the fishways during the extra count period (Chelan PUD 2008). Visual counts at the Rocky Reach Adult Fishway from 2002 to 2022 have enumerated a total of 2,767 Bull Trout with an annual average of 132. The maximum annual count of 246 occurred in 2003, and the minimum annual count of 60 occurred in 2021.

As part of the implementation of the Rock Island and Rocky Reach BTMPs, and in consultation with the Rocky Reach Fish Forum, Chelan PUD conducted additional PIT-tag studies to investigate Bull Trout passage and interactions with the Rock Island, Rocky Reach, and Tumwater Adult Fishways, Rocky Reach Juvenile Fish Bypass, and Dryden Diversion Dam (Chelan PUD 2019, Four Peaks 2022). Upon completion in 2022, the final report documented a total of 2,057 passage and interaction events originating from 436 individual PIT-tagged Bull Trout over a 15-year period. The majority of interactions (95 percent) with Chelan PUD facilities and infrastructure were successful for both adult and subadult Bull Trout, as survival was verified by subsequent PIT-tag detections or recapture after the interaction event. The remaining 5 percent of interaction events were classified as incomplete or unknown, indicating that post-interaction survival was not verifiable.

At the Rock Island Adult Fishways, 57 detection events from 42 individual tagged Bull Trout were documented during the 2008 to 2022 period. On average, four PIT-tag detections occurred each year; the annual maximum was nine in 2010, while the minimum of zero was observed in three years: 2008, 2020, and 2022. At the Rocky Reach Adult Fishway, 154 detection events were documented from 111 individual tagged Bull Trout. On average, 11 PIT-tagged Bull Trout were observed each year, and the maximum number of PIT-tag detections was 25 in 2014, while the minimum of zero was observed in four years: 2008 and 2020 to 2022 (Four Peaks 2022). Among the Bull Trout detected at both Rock Island and Rocky Reach Fishways, 26 individual Bull Trout were observed at both projects; therefore, 62 percent of the 42 Bull Trout detected at Rock Island were also detected at Rocky Reach, and 23 percent of the 111 Bull Trout detected at Rocky Reach were also detected at Rock Island.

The study also included a photographic assessment of Bull Trout condition for PIT-tagged individuals passing through the Rock Island and Rocky Reach Fishways from 2019 to 2022 (Photo 1). A total of seven passage events were photographed at Rock Island (n = 1) and Rocky Reach (n = 6), and all fish observed were free of external injuries and appeared to be in good condition overall (Four Peaks 2022).

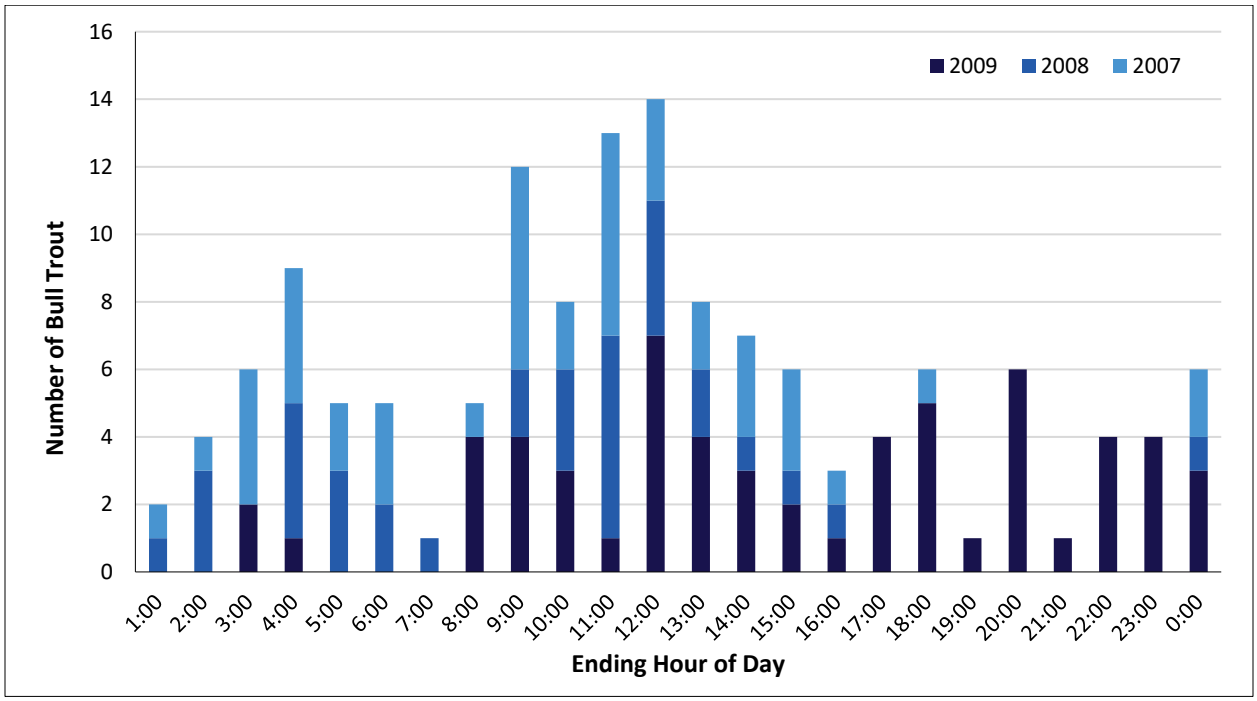
The number of individual PIT-tagged Bull Trout detected at the Rock Island and Rocky Reach Adult Fishways represented 0.5 percent and 1.4 percent, respectively, of the 8,034 Bull Trout that were PIT-tagged and released in the Wenatchee, Entiat, and Methow river basins since PIT tagging began (2004 to 2022; PTAGIS 2023). Bull Trout have not been detected from other river basins at either Rocky Reach or Rock Island Fishways (see Section 2.2.2).

As part of the Rock Island BTMP (Chelan PUD 2005), diel passage timing at the Rock Island Adult Fishway was evaluated from 2007 to 2009 (Figure 1; Chelan PUD 2009). Passage events occurred day and night, but peak passage occurred in the late morning between 9:00 a.m. and 12:00 p.m.

(Figure 1). In addition, Chelan PUD reported that most Bull Trout visually counted at the Rock Island Adult Fishway between 2000 and 2009 used either the left or right ladders, and less than 5 percent used the center ladder (Table 1; Chelan PUD 2009

Note: This Bull Trout was PIT-tagged in the Methow River on September 29, 2017, and eventually passed through the Rocky Reach Fishway on June 2, 2019.

Photo 1. Photograph of Bull Trout 3D9.1C2E0BF83B (upper) at the Rock Island Fishway Right Bank Count Window



Source: Bioanalysts 2009

Figure 1. Diel Timing of Bull Trout Passage at Rock Island Dam Adult Fishway During the Period of 2007 to 2009

Table 1. Rock Island Fishway Selection by Bull Trout from 2000 to 2009

YEAR	NUMBER OF BULL TROUT USING ROCK ISLAND FISHWAYS		
	LEFT FISHWAY	CENTER FISHWAY	RIGHT FISHWAY
2000	45	3	40
2001	42	1	39
2002	41	2	41
2003	34	6	62
2004	47	8	59
2005	27	5	34
2006	20	1	14
2007	24	0	21
2008	20	1	15
2009	32	1	27
Total	**332**	**28**	**352**
Percent of all Bull Trout using Fishway	**46.6%**	**3.9%**	**49.4%**

Source: BioAnalysts 2009

Most of the 42 PIT-tagged Bull Trout detected at Rock Island were originally tagged in the Entiat River Basin (Table 2). In total, 69 percent, 19 percent, and 12 percent of the detections originated from Bull Trout PIT tagged in the Entiat, Wenatchee, and Methow river basins, respectively. Like

Rock Island, the largest group of PIT-tagged Bull Trout detected at Rocky Reach were originally tagged in the Entiat River Basin (Table 3). In total, 50 percent, 41 percent, and 9 percent of the detections originated from Bull Trout PIT tagged in the Entiat, Wenatchee, and Methow River basins, respectively.

Table 2. Tributary and Site Origins of Bull Trout Detected at Rock Island Adult Fishway

MARKED FISH ORIGIN TRIBUTARY BASIN	MARKED FISH ORIGIN MARK SITE (PTAGIS SITE ID)	NUMBER DETECTED AT ROCK ISLAND ADULT FISHWAYS
Wenatchee River	Chiwawa River Trap, 0.5 km below CHIP acclimation pond (CHIWAT)	1
	Dryden Diversion Dam, Wenatchee River (DRY)	1
	Icicle Creek (ICICLC)	1
	Peshastin River (PESHAR)	3
	Tumwater Dam, Wenatchee River (TUM)	2
Entiat River	Entiat River (ENTIAR)	27
	Mad River (MADRVR)	2
Methow	Twisp River (TWISPR)	1
	Twisp River Weir (TWISPW)	3
	Methow River (METHR)	1

Source: Four Peaks 2022

Table 3. Tributary and Mark Site Origins of Bull Trout Detected at Rocky Reach Adult Fishway

MARKED FISH ORIGIN TRIBUTARY BASIN	MARKED FISH ORIGIN MARK SITE (PTAGIS SITE ID)	NUMBER DETECTED AT ROCKY REACH ADULT FISHWAY
Wenatchee River	Chiwaukum Creek, tributary to Wenatchee River (CHIWAC)	1
	Chiwawa River Trap, 0.5 km below CHIP acclimation pond (CHIWAT)	17
	Dryden Diversion Dam, Wenatchee River (DRY)	5
	Icicle Creek (ICICLC)	3
	Nason Creek, tributary to Wenatchee River (NASONC)	1
	Tumwater Dam, Wenatchee River (TUM)	18
Entiat River	Entiat River (ENTIAR)	53
	MAD River, Entiat River Watershed (MADRVR)	1
Methow	Lost River, Methow River Basin (LOSTR)	1

MARKED FISH ORIGIN TRIBUTARY BASIN	MARKED FISH ORIGIN MARK SITE (PTAGIS SITE ID)	NUMBER DETECTED AT ROCKY REACH ADULT FISHWAY
	Twisp River Weir (TWISPW)	6
	Twisp River (TWISPR)	3

Source: Four Peaks 2022

PIT-tag detections from passage events at Rock Island and Rocky Reach Fishways are both relevant for characterizing Bull Trout origins, adult/subadult status, and habitat use patterns within the Rock Island Project Reservoir as the Rocky Reach and Rock Island dams are physically located at the upstream and downstream boundaries of the Reservoir. It follows that any dam passage event at either Project's fishway represents a Bull Trout moving into or out of the Rock Island Reservoir. Among the 42 individual Bull Trout detected at the Rock Island Project, slightly more than half were adults when they were detected in the fishway (Table 4). The largest number of adult Bull Trout originated from the Entiat River Basin, followed in descending order by the Wenatchee and Methow river basins (Table 4). For subadults, 90 percent were from the Entiat River Basin and the remaining 10 percent were from the Wenatchee River (Table 4). The absolute number and ratio of adult to subadult Bull Trout detected at Rocky Reach was about three times higher than at Rock Island (Table 4). Over 50 percent of the adult Bull Trout detected at Rocky Reach were from the Entiat River Basin, followed in descending order by the Wenatchee and Methow river basins (Table 4). Unlike Rock Island, 75 percent of the subadults detected at Rocky Reach were originally tagged in the Wenatchee River and the remaining 25 percent were from the Entiat River Basin (Table 4).

As PIT-tag detections in the adult fishways primarily capture upstream passage events, detections of Bull Trout from upstream tributaries in the adult fishway of a given project indicate the presence of previous downstream passage events. For the Rock Island and Rocky Reach Projects, 100 percent and 59 percent of the individual Bull Trout detected came from fish originating in upstream tributaries, and these fish are presumed to have passed the dams through spill, turbine, or other routes prior to subsequent detections in the adult fishways.

The average time between PIT tagging and subsequent detection of subadult and adult Bull Trout at the Rock Island Adult Fishways was 242 and 432 days, respectively. At the Rocky Reach Adult Fishway, subadults and adults were detected after an average of 107 and 488 days, respectively, after PIT tagging. At both Rock Island and Rocky Reach, the minimum and maximum time between PIT tagging and subsequent detection ranged from several days to several years, with one adult Bull Trout at Rocky Reach requiring about six years to be detected (Table 4).

Table 4. Origins of Adult and Subadult Bull Trout Detected at Rock Island and Rocky Reach Adult Fishways Between 2008 to 2022

PROJECT FISHWAY WHERE DETECTION OCCURRED	SIZE CATEGORY OF DETECTED BULL TROUT[1]	COUNT OF BULL TROUT DETECTED BY TRIBUTARY BASIN OF ORIGIN			TIME BETWEEN PIT-TAG MARKING AND DETECTION AT PROJECT (DAYS)		
		WENATCHEE RIVER	ENTIAT RIVER	METHOW RIVER	AVERAGE	MINIMUM	MAXIMUM
Rock Island Adult Fishways	Subadult	2	18	-	242	8	567
	Adult	6	11	5	432	203	1,361
Rocky Reach Adult Fishway	Subadult	21	7	-	107	3	483
	Adult	24	47	10	488	39	2,169
Rocky Reach Juvenile Bypass	Subadult	-	10	3	131	2	626
	Adult	-	2	1	349	172	1,118

Sources: Four Peaks 2022; PTAGIS 2023
[1]Bull Trout classified as adults if length >12 in. or subadults if length ≤ 12 in.

All PIT-tag detections at Rock Island and Rocky Reach Adult Fishways were from Bull Trout PIT-tagged at tributaries or other locations upstream of the Rock Island Project (Four Peaks 2022). Similarly, all Bull Trout ever detected in tributary arrays within the Wenatchee, Entiat, and Methow river basins originated from these tributaries or marking locations upstream of the Rock Island Project (PTAGIS 2023). Genetic population analysis performed by the United States Fish and Wildlife Service (USFWS) on 163 Bull Trout tissue samples collected by Chelan PUD at the Rock Island, Rocky Reach, and Tumwater Adult Fishways also determined that all samples most likely originated from Wenatchee, Entiat, or Methow River tributary populations upstream of the Rock Island Project (Table 5; Adams and Smith 2020).

Table 5. Genetic Assignments to Populations for Bull Trout collected at Rock Island, Rocky Reach, and Tumwater Dams in 2001, 2002, 2005, 2006, 2007, and 2019

MOST LIKELY POPULATION	MOST LIKELY REPORTING GROUP	NUMBER OF INDIVIDUALS
Chiwaukum Creek	Wenatchee	19
Chiwawa River	Wenatchee	8
Ingalls Creek	Wenatchee	8
Nason Creek	Wenatchee	5
White River	Wenatchee	1
Entiat River	Entiat	56
Mad River	Entiat	30
Early Winters Creek	Methow	6
Twisp River	Methow	25
Wolf Creek	Methow	1
Bull x Brook Hybrid		1
Not Enough Loci Genotyped		3

MOST LIKELY POPULATION	MOST LIKELY REPORTING GROUP	NUMBER OF INDIVIDUALS
Total		163

Source: Adams and Smith 2000
Note: Individuals with missing genotypes at four or more loci were not analyzed. Assignments were based on 15 microsatellite loci using a baseline dataset consisting of 21 spawning populations.

2.1.3 Discussion and Conclusions

Over the last two decades, Bull Trout monitoring efforts have increased at Rock Island and Rocky Reach Projects. Some of the key findings from recent monitoring efforts include:

- Average annual visual counts at each project range from 56 to 132 observations at Rock Island and Rocky Reach, respectively. However, these numbers are likely overestimating the number of individuals passing each project. This conclusion is based on PIT-tag data that demonstrate individual Bull Trout may ascend an adult fishway multiple times within or among a given year. For example, at Rock Island Adult Fishways, 57 detections originated from 42 individual Bull Trout, and at the Rocky Reach Adult Fishway, 154 detections resulted from 111 individual Bull Trout. Visual counts cannot differentiate among individual Bull Trout, and multiple ascensions are included in total counts. If we assume that the ratios of PIT-tag detections to unique PIT-tagged individuals can be used as "correction factors" for visual counts, the actual average number of individual Bull Trout counted annually would be around 41 at Rock Island (i.e., 73.7 percent of 56) and 132 at Rocky Reach (i.e., 72.1 percent of 132).
- PIT-tag and genetic data both suggest that Bull Trout detected at and above Rock Island Adult Fishways originate from river basins upstream of Rock Island Dam (Wenatchee, Entiat, and Methow river basins). Fish from lower basins within the Columbia River Basin have not been detected at the Rock Island Fishway or any locations upstream of Rock Island Dam.
- PIT-tag studies demonstrate that Bull Trout successfully pass upstream and downstream (inferred) at Rock Island and Rocky Reach Projects, with 26 individual fish detected in the adult fishways of both projects.
- Very few PIT-tagged Bull Trout are detected at the Rock Island and Rocky Reach Adult Fishways. With over 8,000 PIT-tagged individuals released upstream of the Rock Island Dam, less than 50 have been detected at Rock Island Dam. Movements of Bull Trout tagged upstream of Rock Island Dam into tributaries downstream of Rock Island Dam are extremely rare (Barrows et al. 2016), so it is unlikely that Bull Trout moving undetected through spill or turbine routes are "relocating" to other tributary habitats. The rarity of detections at Rock Island Dam highlights the complexity of Bull Trout movements and life

history variability and the difficulty of tagging sufficient numbers of fish from a given tributary to conduct focused dam passage evaluations.

- The time between PIT tagging and detection at Rock Island and Rocky Reach Adult Fishways was highly variable, ranging from days to years. This is an important insight provided by the substantial number of PIT tags released in tributary habitats and should be considered in future studies where active tags and battery life are a consideration.

2.2 TRIBUTARY HABITATS

2.2.1 Methods

2.2.1.1 Smolt Trap Data

Smolt trap data were used to document the timing of downstream movements by Bull Trout within the Wenatchee, Entiat, and Methow river basins. For each river basin, two smolt traps were evaluated (Table 6) to detect similarities and differences between movement timing at upstream and downstream locations within each basin. Unlike anadromous salmonid smolts with predictable migration templates, Bull Trout exhibit a wide range of life history variation, and downstream movements may reflect dispersal within a river basin or movement out of the basin (i.e., into the Columbia River). For this reason, a subset of tributary smolt traps adjacent to the confluence with the Columbia River was selected as logical sites to detect fish most likely to move into the Columbia River. Similarly, a second subset of smolt traps further upstream was selected to see if movement timing was longitudinally concordant within the tributary, or if different movement patterns existed between trap locations.

Table 6. Smolt Trap Locations in Wenatchee, Entiat, and Methow River Basins

SMOLT TRAP	BASIN	BASIN RIVER (KM)	LATITUDE	LONGITUDE
Chiwawa River Trap	Wenatchee River	77	47.815	-120.641
Lower Wenatchee River Trap	Wenatchee River	13	47.512	-120.448
Upper Entiat River Trap	Entiat River	11	47.697	-120.323
Lower Entiat River Trap	Entiat River	2	47.664	-120.243
Twisp River Trap	Methow River	66	48.367	-120.139
Methow River Trap	Methow River	30	48.151	-120.055

Source: PTAGIS

Smolt trap data were unavailable from all locations every year, so the most recent data were analyzed. For the Wenatchee and Methow river basins, recent smolt trap data spanning a 9- to 11-year period of record were available. The available Entiat River smolt trap data were older and spanned a 2 to 5-year period of record.

Smolt trap data used in this memorandum were collected by hatchery and watershed monitoring and evaluation programs managed by Chelan PUD, Public Utility Districts of Grant and Douglas counties, USFWS, and the National Oceanic and Atmospheric Administration Fisheries' Integrated Status and Effectiveness Project. The managing entities uploaded program data to DART, where it is publicly available, and all queries and analyses presented here were subsequently derived from DART. As their name implies, smolt traps are more effective at capturing juvenile fish than adults, so it is presumed that most of the captures reported in DART were from juvenile or subadult Bull Trout.

2.2.1.2 PIT Detections

PIT-tag detections were used to determine when Bull Trout may be moving between tributary and Columbia River habitats. The approach focused on enumerating all PIT-tag detections at the lowest PIT detection arrays in each tributary. Detections were compiled using PTAGIS for all Bull Trout detected at the Lower Wenatchee ("LWE", basin river mile = 1.5), Lower Entiat ("ENL", basin river mile = 0.9), and Lower Methow ("LMR", basin river mile = 1.7 [2009 – 2017], relocated to basin river mile 4.6 in August 2017) PIT-tag detection arrays. PIT detection data were qualitatively compared to smolt trap data to determine whether putative movement patterns were similar using both data sets.

While detecting a fish at a lower tributary array does not provide definitive evidence of movement between tributary and Columbia River habitats, it is presumed that fish transiting between habitats would pass over the lower tributary arrays. Detections at these locations are helpful as an indicator of seasonal movement patterns between tributary and Columbia River habitats. As this analysis focused on detections at a single array within each tributary, interpreting the directionality of upstream or downstream movement was not possible. Instead, the goal was to determine if a signal suggests increased movement frequency between tributary and Columbia River habitats.

2.2.2 Results

2.2.2.1 Smolt Traps

The cumulative number of Bull Trout captured in smolt traps by month is presented in Figures 2–7. The analyses presented for each tributary illustrate the general periodicity of presumed downstream movements but have not been corrected for environmental conditions or operational variability that would otherwise be necessary for an accurate abundance estimate. Smolt trap operations typically cease in December through February because of freezing conditions, so captures in those months are typically zero, although fish movements may still occur.

Wenatchee River

Bull Trout capture numbers were much higher at the Chiwawa River Trap in the upper Wenatchee River Basin than at the Lower Wenatchee River Trap in all years and months analyzed (Figure 2 and Figure 3). For the Chiwawa Trap, a total of 2,888 Bull Trout were captured over the 11-year period of record (i.e., n = 263/year), while the total for the Lower Wenatchee River Trap was 19 Bull Trout over the 9-year period of record (i.e., n = 2/year). At the Chiwawa River Trap, captures peaked in September through November, with a second smaller mode in April through June (Figure 2). For the Lower Wenatchee River Trap, Bull Trout captures peaked in April and May, and fall captures were rare (Figure 3).

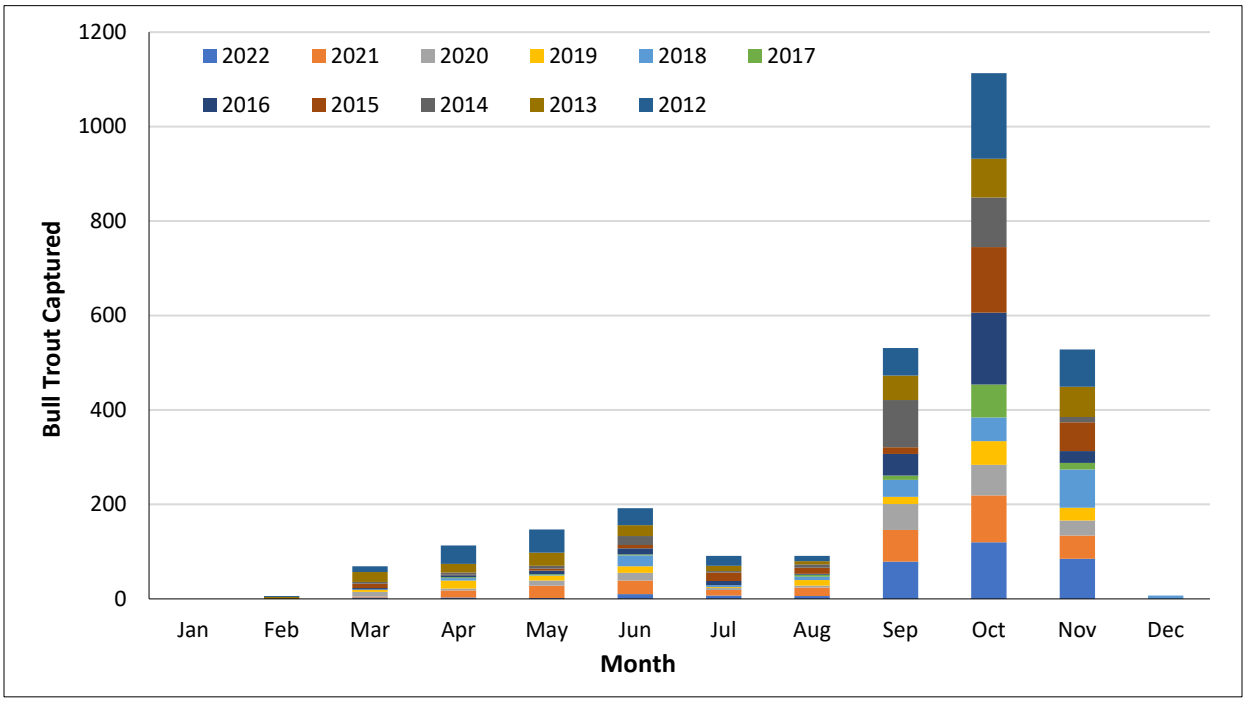


Figure 2. Cumulative Monthly Bull Trout Captures at the Chiwawa River Smolt Trap During the Period of 2012 to 2022

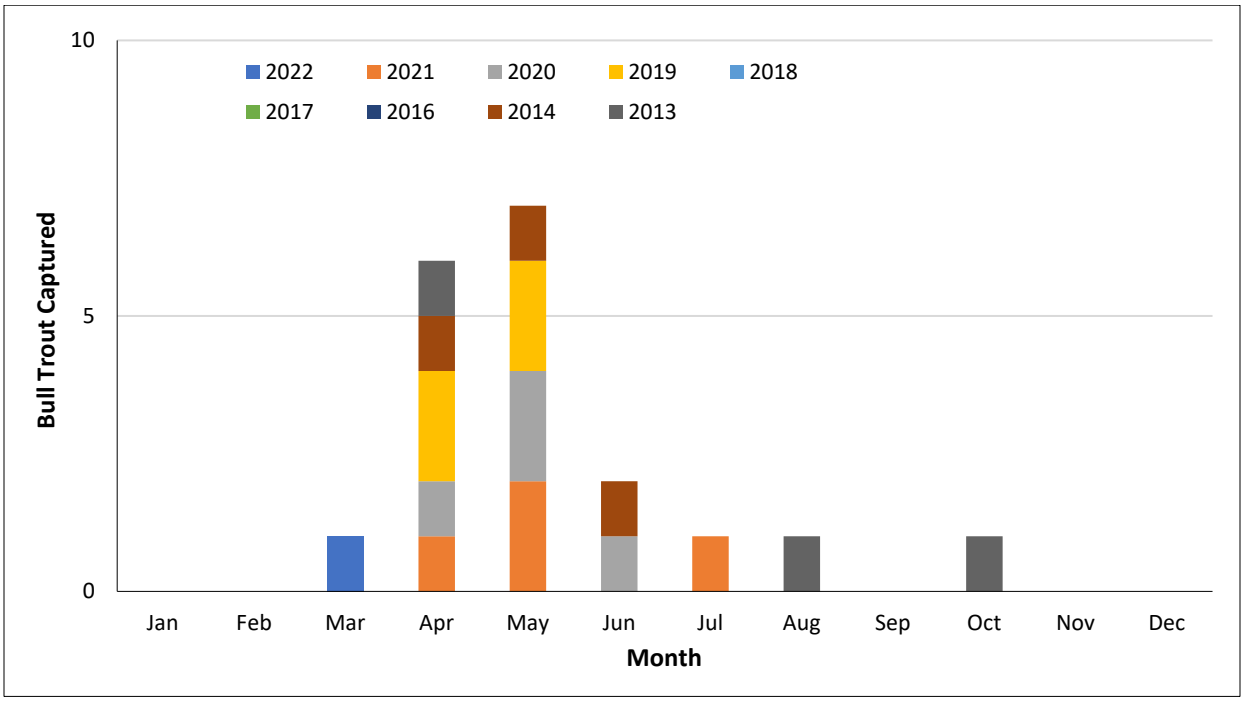


Figure 3. Cumulative Monthly Bull Trout Captures at the Lower Wenatchee River Smolt Trap During the Period of 2013 to 2022

Entiat River

The most recent Entiat River smolt trap data were limited to a few years between 2004–2008. Both the Upper Entiat River (Figure 4) and Lower Entiat River (Figure 5) traps appeared to show nearly identical catch patterns with a spring and fall mode. For the spring mode, the highest number of captures occurred in May and June; for the fall mode, the highest number occurred in October and November. It should be noted that the 2008 trapping year had a dominant effect on the movement patterns observed at both sites. Given the small number of years included in the analysis, it is unclear if 2008 was an anomalous year or if capture rates in earlier years were reduced by habitat conditions further upstream. Nelson and Nelle (2008) reported the formation of natural barriers to passage in Box Canyon and Mad River during 2003–2006, which may have contributed to lower smolt trap capture rates during overlapping years.

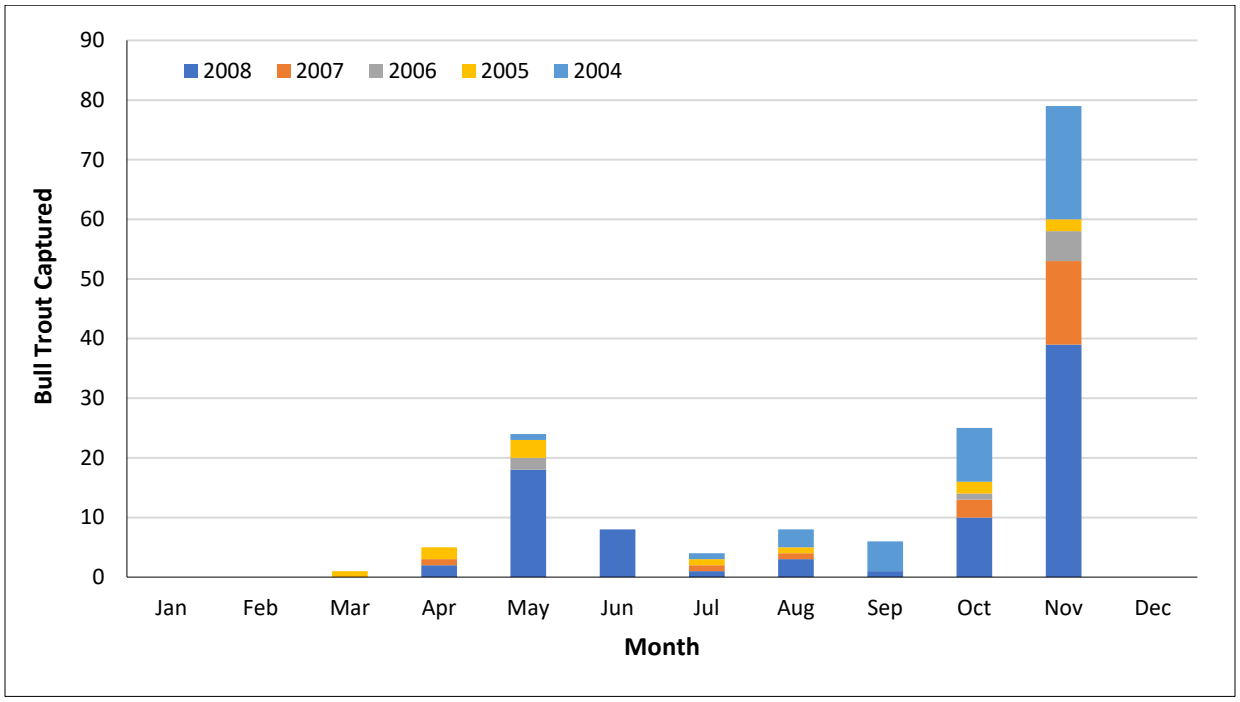


Figure 4. Cumulative Monthly Bull Trout Captures at the Upper Entiat River Smolt Trap During the Period of 2004 to 2008

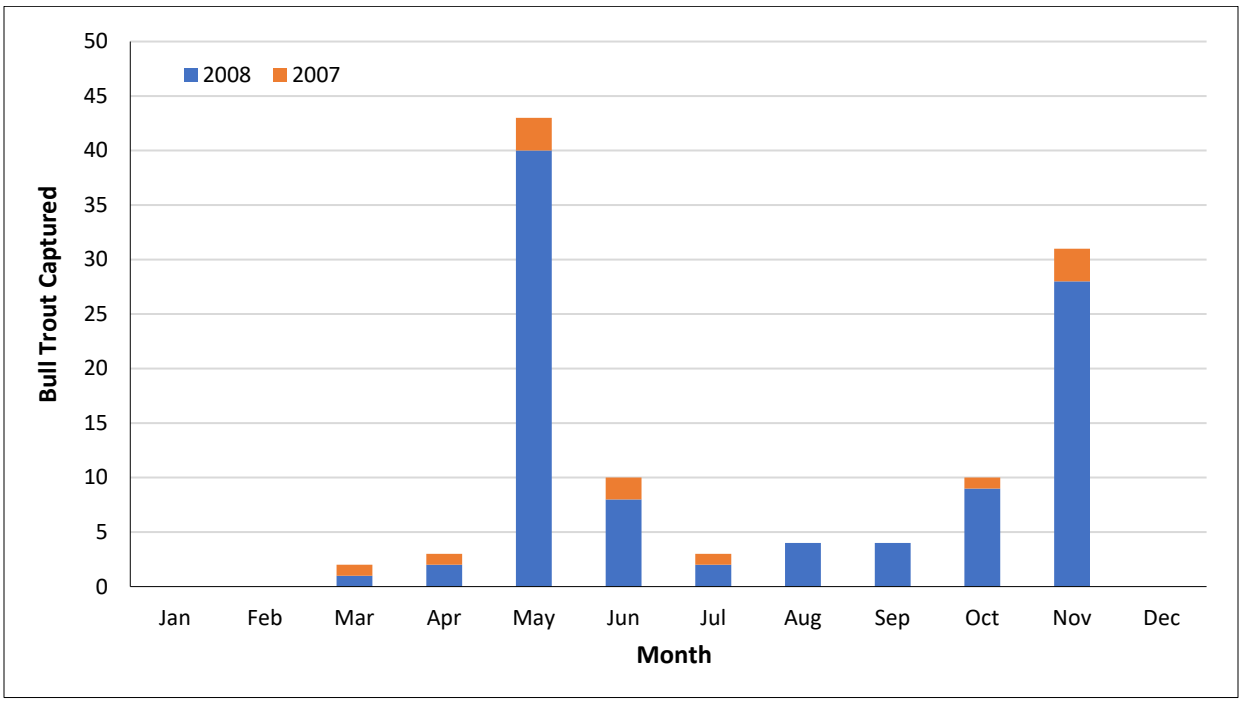


Figure 5. Cumulative Monthly Bull Trout Captures at the Lower Entiat River Smolt Trap During the Period of 2007 to 2008

Methow River

Similar to the Wenatchee River, the smolt trap higher in the Methow River Basin (i.e., Twisp River trap) had much higher numbers of Bull Trout captures (n = 227; Figure 6) compared to the Methow River trap (n = 27; Figure 7) over the same 11-year period of record. Both the upper and lower traps appeared to show similar catch patterns with a spring and fall mode. For the spring mode, the highest number of captures occurred in April through June; for the fall mode, the highest number occurred in October and November.

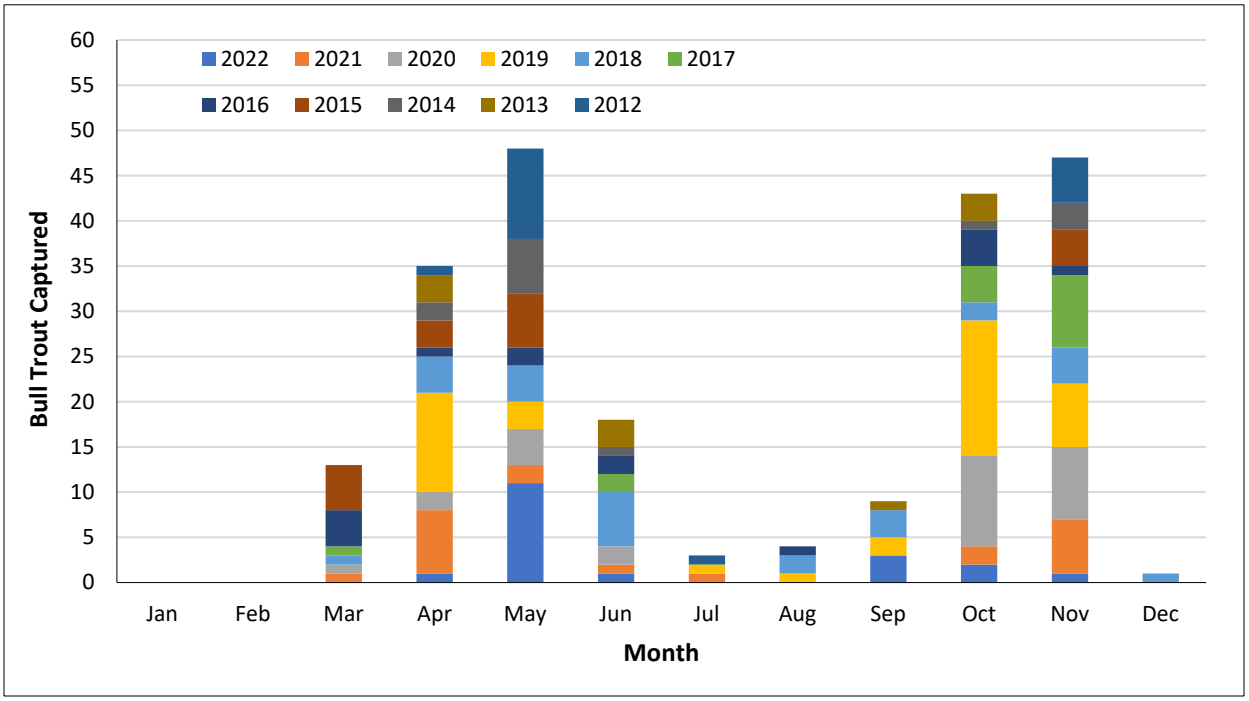


Figure 6. Cumulative Monthly Bull Trout Captures at the Twisp River Smolt Trap During the Period of 2012 to 2022

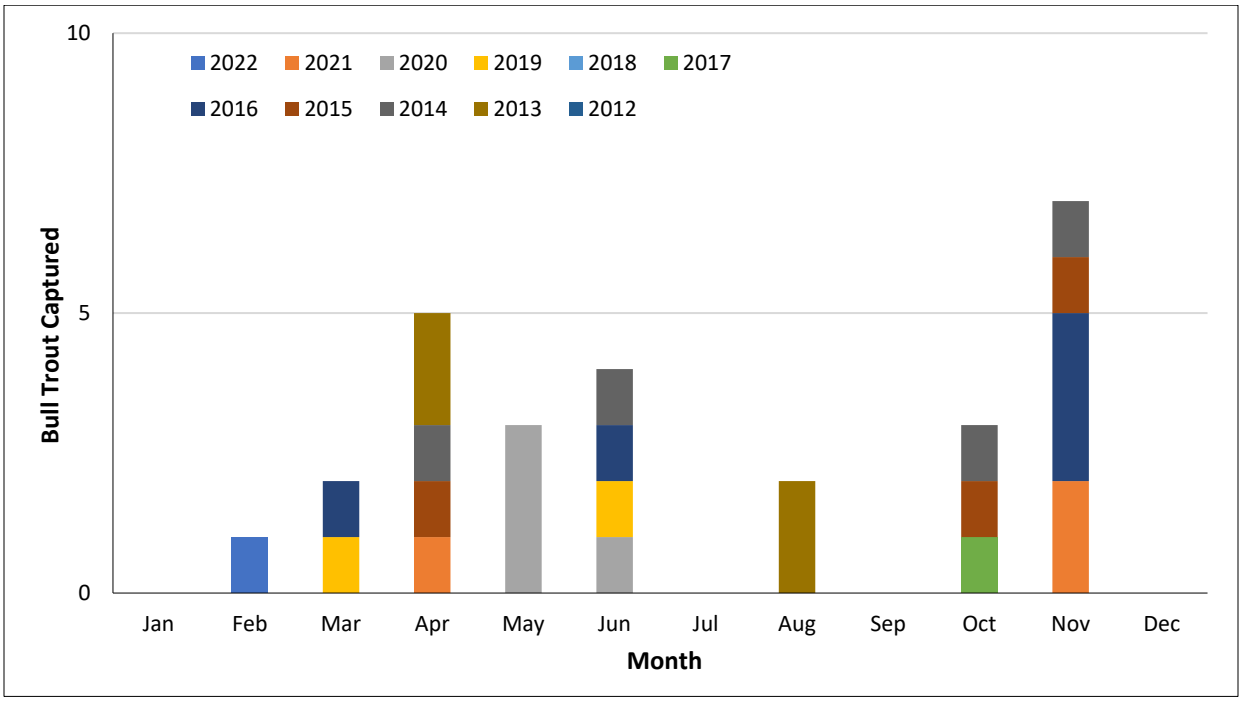


Figure 7. Cumulative Monthly Bull Trout Captures at the Methow River Smolt Trap During the Period of 2012 to 2022

Similar passage modes between upper and lower basin traps may reflect basin-wide downstream movements by Bull Trout to the lower river basin or Columbia River. For the Methow and Entiat river basins, the timing of spring and fall modes appear to be aligned with each other (Figures 4–7), whereas, in the Wenatchee River Basin, the fall mode observed in the Chiwawa River (Figure 2) is not evident at the Lower Wenatchee River Trap (Figure 3). The fall movements in the Chiwawa River may reflect Bull Trout redistribution within the upper Wenatchee River Basin as opposed to basin-wide movement downstream or out of the Wenatchee River.

Although the analysis here focused on qualitative comparisons of movement timing, the difference between the absolute number of Bull Trout captured at upper and lower basin traps was noteworthy. Captures at the Lower Methow and Wenatchee River Basin traps were extremely rare, even during the periods when peak numbers were observed (Table 7). The mean and median monthly number of fish captured did not exceed one fish at either site in any period. Compared to the upper basin traps, the rarity of captures in the Lower Methow and Wenatchee River Basin traps may simply reflect smolt trap performance, or the difference may be attributable to the number of fish moving downstream in the lower river.

Table 7. Median and Average Numbers of Bull Trout Captured per Month at Smolt Traps During Peak Spring and Fall Movement Periods

RIVER BASIN LOCATION	SMOLT TRAP NAME	SPRING (APRIL TO JUNE) CAPTURES		FALL (OCTOBER–NOVEMBER) CAPTURES	
		MEDIAN (MONTHLY)	AVERAGE (MONTHLY)	MEDIAN (MONTHLY)	AVERAGE (MONTHLY)
Upper Wenatchee River	Chiwawa River Trap	10	14	68	23
Lower Wenatchee River	Lower Wenatchee River Trap	0	1	0	0
Upper Entiat River	Upper Entiat River Trap	1	2	7	10
Lower Entiat River	Lower Entiat River Trap	3	9	6	10
Upper Methow River	Twisp River Trap	2	3	0	2
Lower Methow River	Methow River Trap	0	0	0	0

2.2.2.2 PIT Tags

To further evaluate potential movement patterns in the Wenatchee, Entiat, and Methow river basins, PIT-tag data were queried, and a total of 680 detection events originating from 372 unique Bull Trout tag codes were detected at the lower tributary arrays between 2008 and 2022 (Table 8; PTAGIS 2023). On average, the LWE, ENL, and LMR arrays detected 9, 12, and 7 unique tag codes per year, respectively. Most of the fish detected in each tributary had originally been tagged in the same tributary (Table 8).

Table 8. Summary of Passive Integrated Transponder (PIT) Tag Detections in the Lowest PIT Detection Arrays Within the Wenatchee, Entiat, and Methow River Basins

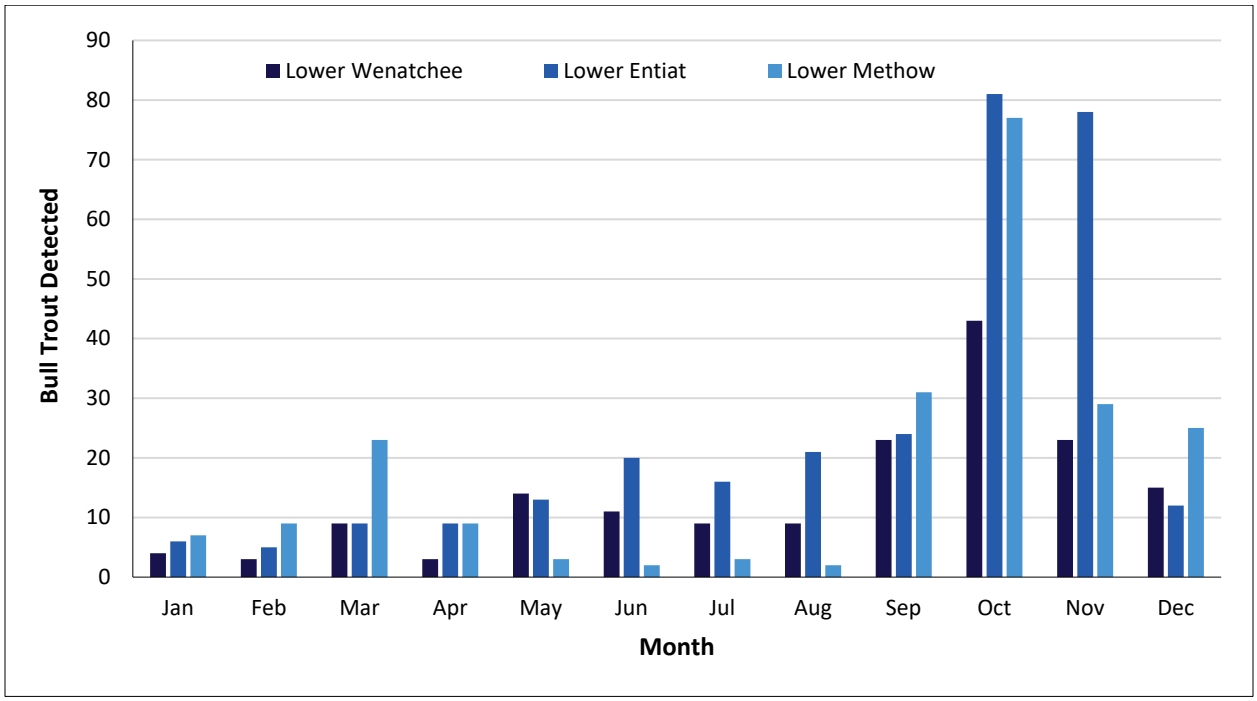
METRIC	DETECTION SITE		
	LOWER WENATCHEE (LWE)	LOWER ENTIAT (ENL)	LOWER METHOW (LMR)
Detection Years[1]	2010–2022 (n = 12)	2008–2022 (n = 14)	2009–2022 (n = 13)
Total Observations	166	292	211
Unique Tags	102	164	95
Wenatchee-origin Bull Trout	79	11	0
Entiat-origin Bull Trout	21	148	0
Methow-origin Bull Trout	2	5	95

Source: PTAGIS 2023

Notes: [1] The detection years encompass all detection records for each site beginning with the first year a detection occurred at the site.

Similar to the Chiwawa, Upper Entiat, Lower Entiat, Methow, and Twisp smolt traps (Figures 2 and 4 to 7), relatively large numbers of PIT-tag detections occurred in fall months, with the highest number occurring in October for all tributary arrays (Figure 8). A small second mode of PIT-tag detections was also apparent in May for the Wenatchee River and in March for the Methow River (Figure 8).

In contrast to the smolt trap data, PIT detections at the LWE array peaked in September through November (Figure 8), while smolt trap captures were virtually non-existent during the same period at the LWE smolt trap (Figure 3). Similarly, the PIT detections in September at the LMR array (Figure 8) were the second highest of any month but corresponded with zero captures at the Methow River smolt trap (Figure 7). This discordance among smolt trap data and PIT-tag detection data may reflect fall upstream movements of adults or spawners, as smolt traps would not detect upstream movements and spawning typically occurs in the fall for Bull Trout. Within the Entiat River Basin, PIT detections at the ENL array did not peak in May (Figure 8), as observed in both tributary smolt traps (Figure 4 and Figure 5). This may partly reflect the differences in years evaluated for both methods, as there was no temporal overlap among the smolt trap and PIT-tag data sets or general differences in the effectiveness of smolt traps and PIT detection arrays during the spring. Finally, among all basins, in December, January, and February, when smolt traps were not operational, PIT-tag detections were observed at all lower tributary arrays (Figure 8), indicating movement among Bull Trout at each location.



Source: PTAGIS 2023

Figure 8. Cumulative Passive Integrated Transponder (PIT) Tag Detections by Month for the PIT Detection Arrays in the Lower Wenatchee River During 2010–2022, Lower Entiat River During 2008–2022, and Lower Methow River During 2009–2022

2.2.3 Discussion and Conclusions

Some of the key findings from recent monitoring efforts include:

- Among all smolt trap locations, Bull Trout captures appeared to increase from April through June. For the Chiwawa, Upper Entiat, Lower Entiat, Twisp, and Methow River traps, a second larger mode of captures occurred in October–November. These data collectively suggest that downstream movements by presumed subadult Bull Trout peak in spring and fall months. Conversely, downstream movements from July through September appear to be relatively rare—except for the Chiwawa River Trap, where September captures were common. The timing of movements of subadult Bull Trout between the Wenatchee, Entiat, or Methow river basins and the Columbia River is not well documented, but movements within tributaries may occur throughout the year (Barrows 2016).
- In contrast to smolt traps, which are biased towards capturing smaller fish moving downstream, PIT detections likely represent a greater proportion of adult fish that may be moving upstream or downstream. The increase and peak in PIT-tag detections between September and November at all lower tributary arrays overlap with the typical spawning

period for Bull Trout in the Wenatchee, Entiat, and Methow river basins (USFWS 2015) and likely includes the movement of adults to and from spawning areas.

- The average and median monthly capture rates at lower river basin smolt traps within the Methow and Wenatchee River basins are near zero in all months. These results may be important for future studies of Bull Trout that require large sample sizes as these trap locations are unlikely to provide a reliable source of juvenile/subadult Bull Trout.
- Recognizing that the effectiveness of PIT-tag detection arrays can be influenced by flow, numbers of tagged fish, and other factors, quantitative comparisons of detection numbers among sites are problematic. With this caveat, and without correcting for potential biases, the available PIT-tag data support the premise that a larger proportion of Bull Trout from the Entiat River enters the Columbia River than Bull Trout from either the Wenatchee or Methow Rivers (USFWS 2015; Table 9). First, PIT-tag data from Rock Island and Rocky Reach Adult Fishways demonstrate that Bull Trout originally tagged in the Entiat River Basin account for over 50 percent of the PIT detections at the two projects (Section 2.1.2, Table 2 and Table 3). Second, the total number of Bull Trout PIT-tagged in the Entiat River Basin is less than half of the total in the Methow River Basin and less than a quarter of the total in the Wenatchee River Basin. Yet, the number of Entiat Bull Trout detected at ENL is over 180 percent and 150 percent of the numbers detected at LWE and LMR, respectively (Table 11). In other words, 15.0 percent of the entire PIT-tagged Entiat River Basin population has been detected within 0.9 miles of the confluence of the Columbia River, whereas only 1.7 percent and 4.1 percent of the tagged Methow and Wenatchee River Basin populations, respectively, have been detected at their lower tributary arrays (Table 10). In addition to the PIT-tag detection data, the rarity of Bull Trout captures in smolt traps in the Lower Methow and Wenatchee River Basins, compared to the Entiat River Basin (Table 7), further suggests that fewer Bull Trout in the Wenatchee and Methow River Basins are engaging in the downstream movements that would be necessary to access the Columbia River, despite indications that both tributaries have substantially larger populations than the Entiat River (USFWS 2008, 2015).

Table 9. USFWS Estimated Percentages of Bull Trout Using the Columbia River from the Wenatchee, Methow, and Entiat Basin Populations

SUBBASIN	PERCENT OF BULL TROUT THAT MIGRATE OUT OF TRIBUTARY SUBBASIN INTO MAINSTEM COLUMBIA RIVER
Wenatchee	15%
Entiat	90%
Methow	15–20%

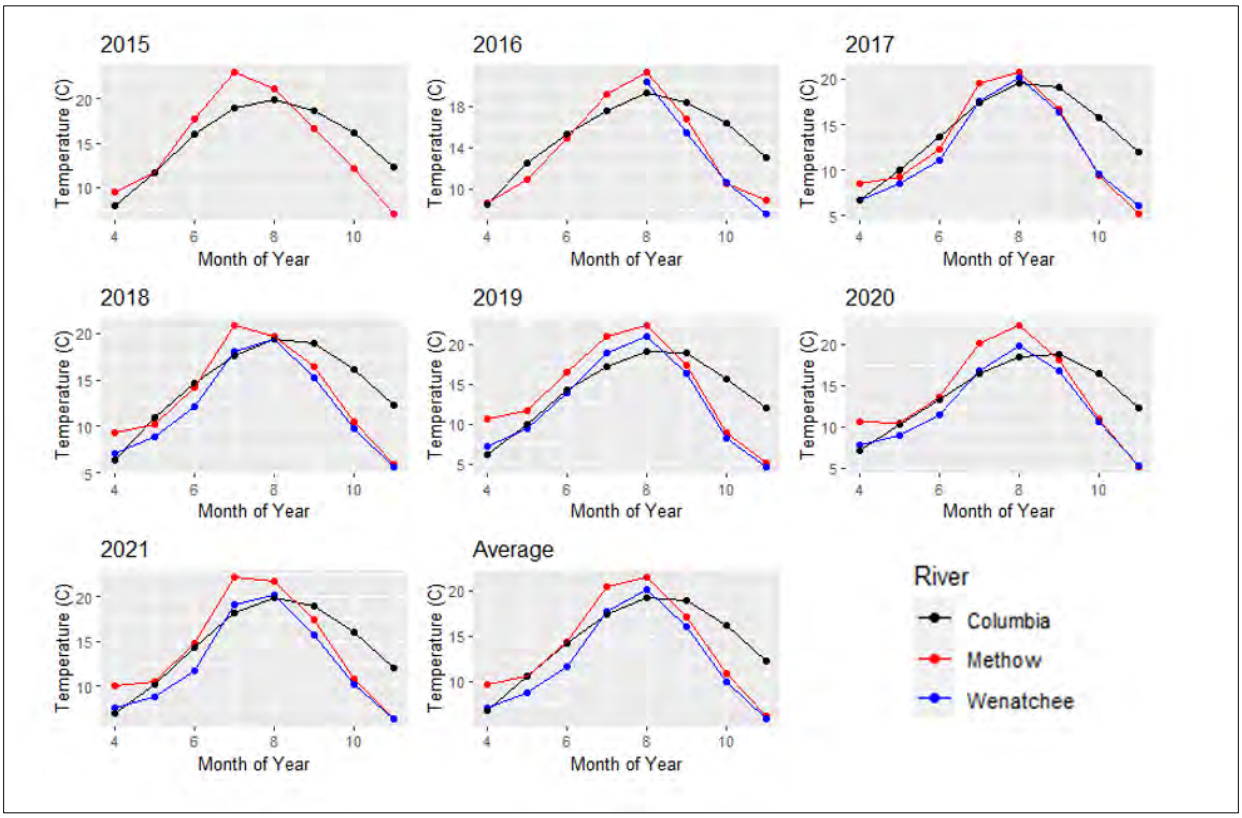
Source: USFWS 2015

Table 10. Bull Trout PIT-tag Detection Summary Statistics for the Lower Wenatchee, Lower Entiat, and Lower Methow River PIT tag Arrays

METRIC	LOWER WENATCHEE RIVER ARRAY (LWE)	LOWER ENTIAT RIVER ARRAY (ENL)	LOWER METHOW RIVER ARRAY (LMR)
PIT detections in the lower tributary array from Bull Trout originating from the same tributary	79	148	95
Total number of PIT-tagged Bull Trout marked in tributary	4,746	984	2,304
Percent of all PIT-tagged Bull Trout detected in all years from Bull Trout originating from the same tributary	1.7%	15.0%	4.1%
Number of years of detections	12	14	13
Percent PIT-tagged Bull Trout detected per year	0.1%	1.1%	0.3%

Source: PTAGIS 2023

Summer water temperatures may contribute to the seasonal movement patterns in tributary habitats. As Bull Trout are sensitive to high temperatures, the low number of captures and PIT detections in the Methow and Wenatchee Rivers during July and August may be in response to thermal conditions within each tributary. Water temperatures typically approach or exceed 68°F (20°C) in the lower Wenatchee and Methow Rivers in July or August, and peak temperatures in both tributaries generally occur in July and August (Figure 9). Although the Columbia River is typically cooler than both tributaries during these months (Figure 9), access to this cooler water may be limited by the occurrence of temperature barriers in the lower tributary reaches. Similarly, adult Bull Trout in the Columbia River may wait to move upstream until tributary temperatures are the same or lower than the Columbia River. Long-term water temperature data for the Entiat River was not available for this analysis, but it is expected that seasonal temperature patterns within the Entiat would be similar to the other tributaries.



Sources: https://www.cbr.washington.edu/dart/query/river_graph_text
https://waterdata.usgs.gov/monitoring-location/12450480/#parameterCode=00010&period=P365D
https://waterdata.usgs.gov/monitoring-location/12462500/#parameterCode=00010&period=P7D

Figure 9. Monthly Temperature for the Columbia River at Rock Island Forebay and Methow River Near Pateros (2015 to 2021), and Wenatchee River at Monitor (2016 to 2021)

3.0 POPULATION STATUS

3.1 ABUNDANCE AND TRENDS

3.1.1 Methods

3.1.1.1 Redd Counts and Spawner Abundance

Redd surveys are the primary data source for estimating Bull Trout population abundance (USFWS 2008). Redds are counted by surveyors, and redd numbers are subsequently expanded by an estimate of spawners-per-redd to obtain an estimate of spawner abundance. Redd surveys have been conducted intermittently within tributaries of the Wenatchee, Entiat, and Methow river

basins by USFWS, WDFW, and other entities since Bull Trout were initially listed in 1998. WDFW compiles redd count data from these sources on their SCoRE database, which is accessible online.[5]

Bull Trout redds are inherently difficult to enumerate because of the species' spawn timing and spawning locations, and counting errors associated with interobserver variation can lead to a high degree of inaccuracy in observed counts (Dunham et al. 2001). For these reasons, and frequent changes in sampling methods or sampling areas noted in SCoRE for many of the tributaries, redd counts may vary in accuracy but nonetheless represent the best available data and one of the primary metrics for characterizing population abundance and measuring progress towards recovery (USFWS 2008). For this memorandum, redd counts for tributaries within each river basin were compiled and compared for available years between the periods prior to the 5-year Bull Trout Status Review ("Pre-status Review"; 1994–2007) and from the 5-year Bull Trout Status Review to the most recent data points available ("Status Review to Present"; 2008–2021). Spawner number was expanded following the methods of Al-Chokhachy et al. (2005) with low, middle, and high range values of 1.2, 2.68, and 4.3 spawners-per-redd, respectively, for Columbia River Bull Trout.

3.1.1.2 Chiwawa River Snorkel Surveys

Chiwawa River Bull Trout are part of the Wenatchee River Basin, and the subpopulation exhibits high levels of migratory life history diversity and is regarded as relatively abundant (USFWS 2015). The subpopulation is also unique because it is the only one considered "long-term stable" among tributaries upstream of the Rock Island Project (USFWS 2015). As such, abundance trends for the Chiwawa River likely have importance for the entirety of the Wenatchee River Basin. The Chiwawa River is also one of the only locations within the Wenatchee, Methow, and Entiat river basins where a long-term continuous population assessment has been conducted. Specifically, Chelan PUD funded snorkeling surveys from 1992 through 2018 as part of its Rock Island and Rocky Reach HCP hatchery monitoring and evaluation program. The annual snorkel surveys provided population estimates for both juvenile and adult Bull Trout, and results were summarized in annual hatchery monitoring and evaluation reports (e.g., Hillman et al. 2022). For this memorandum, data from the surveys were summarized for three periods: the period prior to Endangered Species Act (ESA) listing ("Pre-ESA listing"; 1992–1997), the period from ESA listing to the year prior to the 5-

[5] https://fortress.wa.gov/dfw/score/score/species/bulltrout.jsp?species=Bulltrout

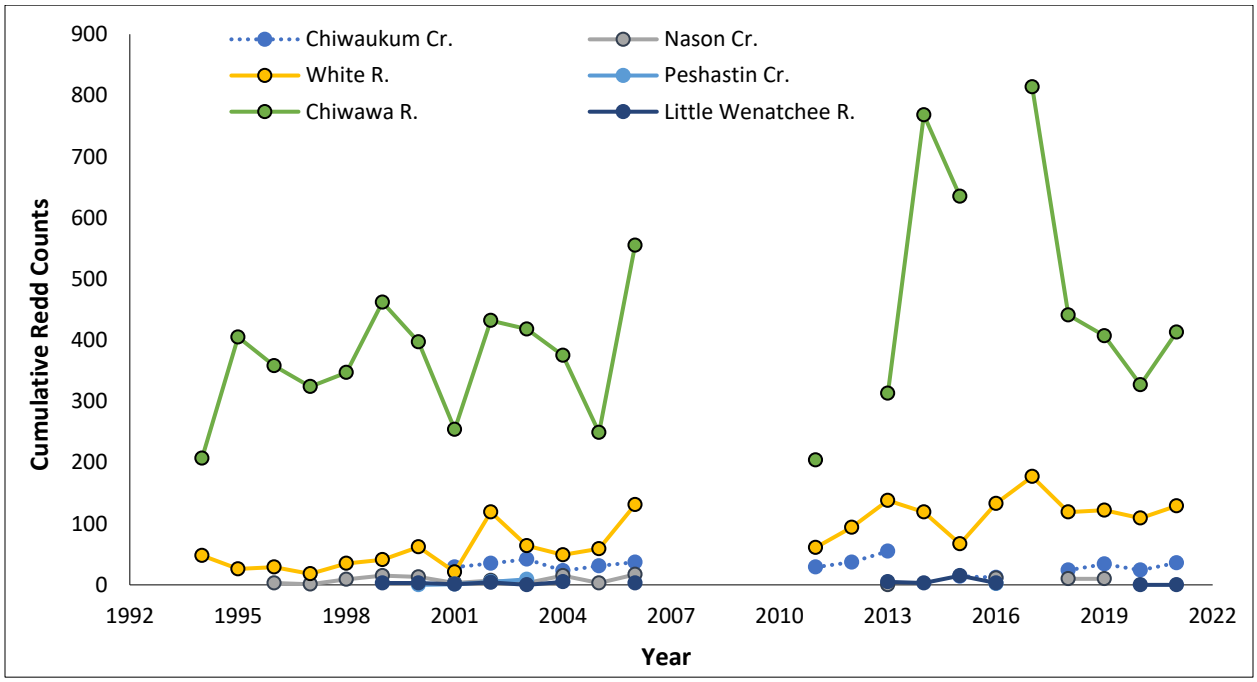
year Bull Trout Status Review ("ESA Listing to Pre-status Review"; 1998–2007), and from the period of the Status Review to the end of the surveys ("Status Review to Completion"; 2007–2018).

3.1.2 Results

3.1.2.1 Redd Counts

Figures 10 to 12 show cumulative redd count trends for tributary subpopulations within the Wenatchee, Entiat, and Methow River basins obtained from SCoRE from 1994 through 2021. Tables 11 through 13 summarize the average cumulative redd count for each tributary population within the river basins during the Pre-status Review (1994–2007) and Status Review to Present (2008–2021) periods. Table 14 shows the overall change in redd counts for each subbasin and the range in the expanded number of individual spawners between the two periods. For the Wenatchee and Methow Rivers, average cumulative redd counts increased by 170 and 62 redds between the Pre-Status Review and Status Review to Present periods, respectively, while the Entiat decreased by 15 redds (Table 14). For all river basins combined, the net number of redds increased by 217 in the Status Review to the Present period.

The expanded spawner counts for Wenatchee, Entiat, and Methow River basins combined increased by a minimum of 261 or a maximum of 934 spawners based on the use of the low or high-range expansion factors (i.e., 1.2 or 4.3 spawners-per-redd) from Al-Chokhachy et al. (2005).



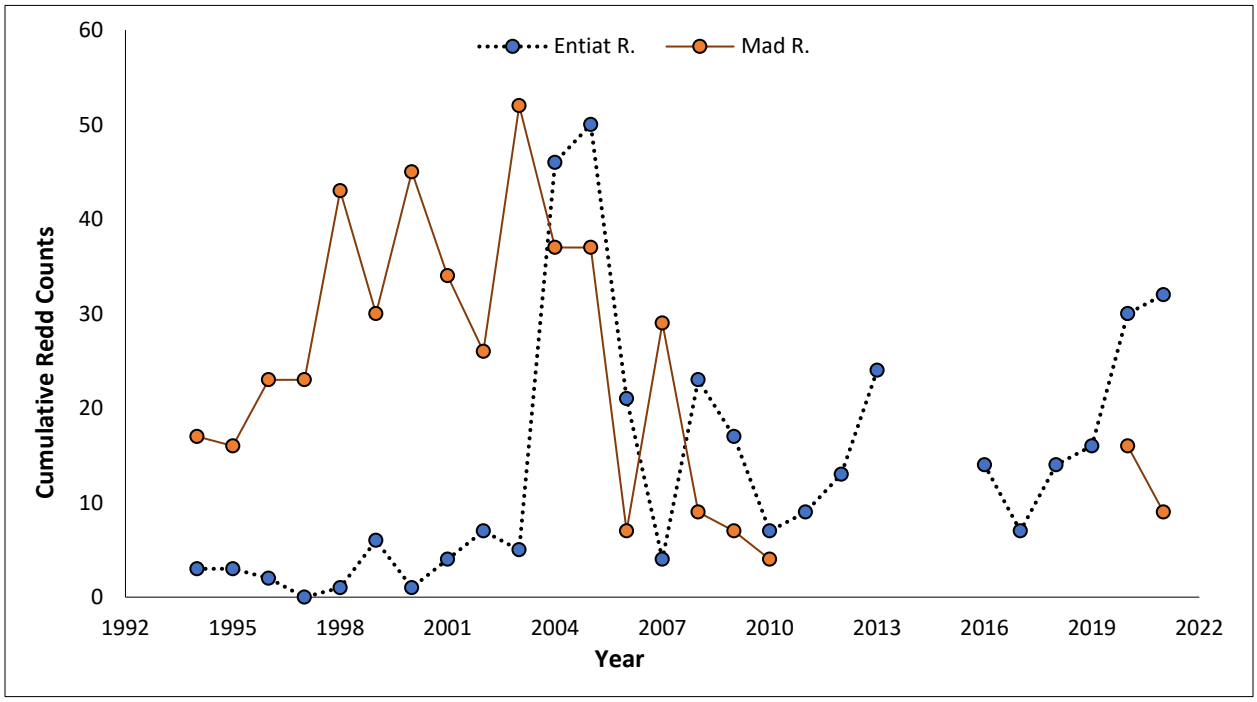
Source: WDFW 2023

Figure 10. Trends in Redd Counts Among Tributaries Populations in the Wenatchee Subbasin between 1994 to 2021

Table 11. Comparison of Average Cumulative Redd Counts during "Pre-status Review" (1994 to 2007) and "Status Review to Present" (2008 to 2021) Periods for Tributary Bull Trout Populations within the Wenatchee River

PERIOD	YEARS	CHIWAUKUM CREEK	NASON CREEK	WHITE RIVER	PESHASTIN CREEK	CHIWAWA RIVER	LITTLE WENATCHEE RIVER
Pre-status Review	1994–2007	33	8	54	4	368	3
Status Review to Present	2008–2021	29	8	115	2	480	4

Source: WDFW 2023



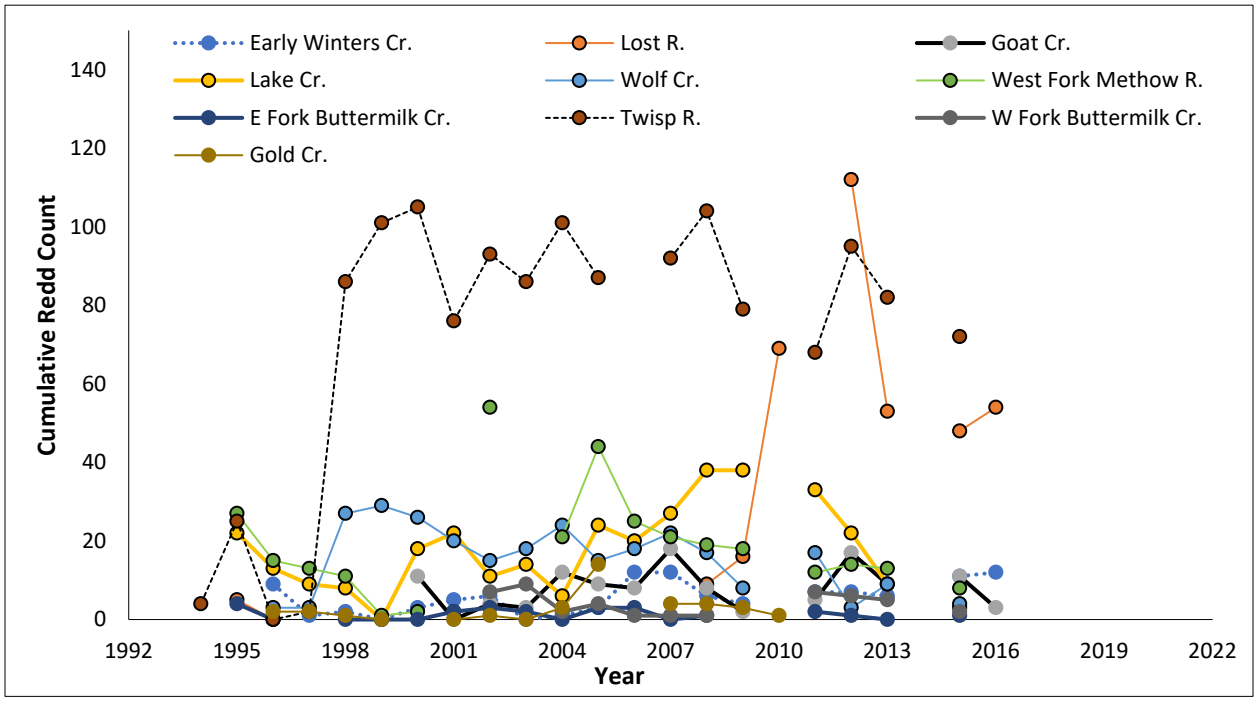
Source: WDFW 2023

Figure 11. Trends in Redd Counts Among Tributaries Populations in the Entiat Subbasin Between 1994 to 2021

Table 12. Comparison of Average Cumulative Redd Counts During "Pre-status Review" (1994 to 2007) and "Status Review to Present" (2008 to 2016) Periods for Tributary Bull Trout Populations within the Entiat Subbasin

PERIOD	YEARS	ENTIAT RIVER	MAD RIVER
Pre-status Review	1994–2007	11	30
Status Review to Present	2008–2021	17	9

Source: WDFW 2023



Source: WDFW 2023

Figure 12. Trends in Redd Counts Among Tributaries Populations in the Methow Subbasin Between 1994 to 2016

Table 13. Comparison of Average Cumulative Redd Counts During "Pre-status Review" (1994 to 2007) and "Status Review to Present" (2008 to 2021) Periods for Group 1 Tributary Bull Trout Populations Within the Methow River Basin

PERIOD	YEARS	W. FORK METHOW R.	E. FORK BUTTERMILK CR.	TWISP R.	W. FORK BUTTERMILK CR.	GOLD CR.
Pre-status Review	1994–2007	21	1	66	4	3
Status Review to Present	2008–2021	14	1	83	4	3
PERIOD	**YEARS**	**EARLY WINTERS CR.**	**LOST R.**	**GOAT CR.**	**LAKE CR.**	**WOLF CR.**
Pre-status Review	1994–2007	5	2	8	15	18
Status Review to Present	2008–2021	8	52	8	24	10

Source: WDFW 2023

Table 14. Comparisons of River Basin Cumulative Redd Counts and Expanded Spawner Counts using Expansion Values from Al-Chokhachy et al. (2005) During "Pre-Status Review" (1994 to 2007) and "Status Review to Present" (2008 to 2021) Periods

RIVER BASIN	PERIOD	CUMULATIVE REDD COUNT	EXPANDED SPAWNER COUNT		
			LOW RANGE[1]	MID. RANGE[1]	HIGH RANGE[1]
Wenatchee	Pre-status Review	469	563	1,258	2,018
	Status Review to Present	639	767	1,713	2,748
Entiat	Pre-status Review	41	49	109	176
	Status Review to Present	26	31	70	113
Methow	Pre-status Review	144	172	385	617
	Status Review to Present	206	247	551	885

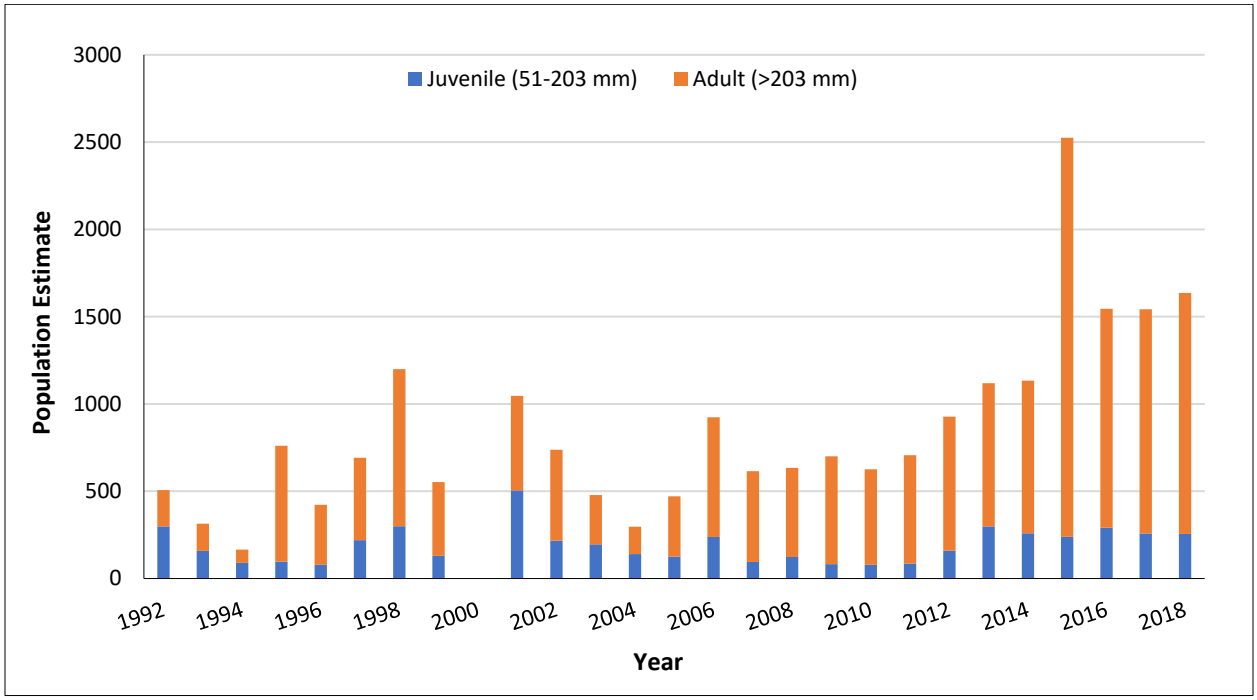
Sources: Al-Chokhachy et al. 2005; WDFW 2023
Note: [1]Low, middle, and high range values of 1.2, 2.68, and 4.3 spawners-per-redd

During the Status Review to Present period, the low range of expanded Methow and Wenatchee River spawners (Table 14) was within the population abundance categories identified by USFWS in the 5-year Status Review (USFWS 2008), whereas the middle and high range estimates of

expanded spawners) exceeded the values identified within the population abundance categories for both basins. For the Entiat River, the low range of expanded spawners (Table 14) was below the minimum range of the population abundance category, while the middle and high range estimates of expanded spawners were within the population abundance category for the core area.

3.1.2.2 Chiwawa Snorkel Surveys

The annual estimated number of juvenile and adult Bull Trout in the Chiwawa River between 1992 and 2018 is summarized in Figure 13. Among the three periods evaluated, the average number of adults and total number of Bull Trout increased in each period, while the number of juveniles was highest in the ESA Listing to Pre-status Review period (Table 15). In the Status Review to Completion period, the adult component of the population increased by over 200 percent compared to the ESA Listing to Pre-Status Review period and increased by over 300 percent compared to the Pre-ESA Listing period (Table 15).



Source: Hillman et al. 2022

Figure 13. Chiwawa River Adult and Juvenile Bull Trout Population Estimates Based on Snorkel Surveys Conducted Between 1992 and 2018

Table 15. Population Estimates for Chiwawa River Adult and Juvenile Bull Trout during "Pre-ESA Listing", "ESA Listing to Pre-status Review" and "Status Review to Completion Periods"

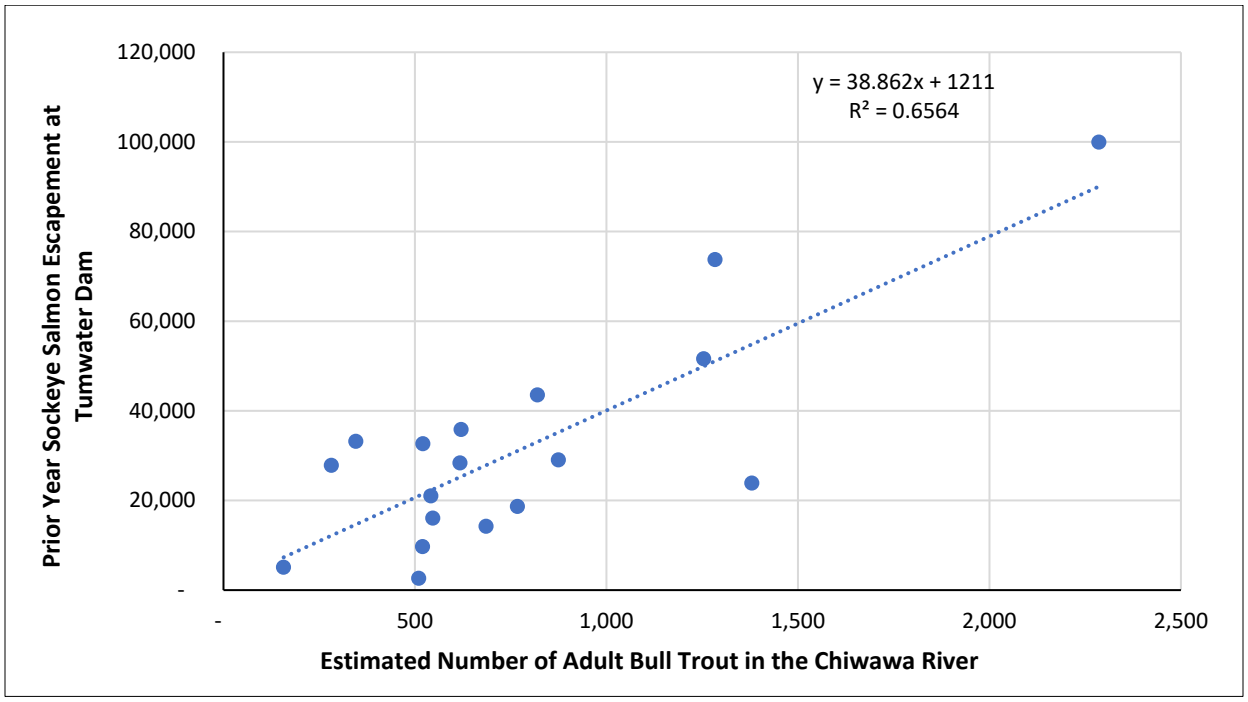
PERIOD	YEARS	AVERAGE NUMBER OF JUVENILES	AVERAGE NUMBER OF ADULTS	AVERAGE TOTAL POPULATION
Pre-ESA Listing	1992 to 1997	157	320	477
ESA Listing to Pre-status Review	1998 to 2007	216	486	703
Status Review to Completion	2008 to 2018	194	997	1190

Source: Hillman et al. 2022

3.1.3 Discussion and Conclusions

Some of the key findings from recent monitoring efforts include:

- Population abundance appears to be increasing in the Wenatchee and Methow river basins, while the Entiat shows a decrease based on redd counts available on SCoRE. Because of the discontinuous nature of the individual tributary data sets and variability in redd survey methodologies, these findings should be interpreted cautiously.
- The increasing abundance of adult Bull Trout in the Chiwawa River (and other Wenatchee River tributaries) may also be related to the relative abundance of Sockeye Salmon returning to the Wenatchee subbasin. As part of Chelan PUD's HCP hatchery monitoring and evaluation program, Sockeye Salmon counts at the Tumwater Adult Collection Facility are collected to monitor escapement into the upper Wenatchee River Basin and Lake Wenatchee. Based on years for which overlapping data were available (2000–2018), the annual abundance of adult Bull Trout (i.e., greater than 8 in. [203 mm]) in the Chiwawa River was highly correlated with the escapement of Sockeye Salmon in the prior year (R2 = 0.66; Figure 14). The positive correlation between Bull Trout and Sockeye Salmon abundance may be related to the availability of marine-derived nutrients provided by spawning anadromous salmon (Schindler et al. 2003). In other low-productivity habitats, such as the Skagit River, Bull Trout rely heavily on nutrients from spawning salmon for growth and survival (Lowery 2009). Tumwater Sockeye Salmon escapement numbers are reported to and publicly available on DART, and adult Bull Trout numbers were obtained from snorkel surveys in the Chiwawa River (Hillman et al. 2022).



Source: Hillman et al. 2022, DART 2023

Figure 14. Association Between Adult Bull Trout Abundance in the Chiwawa River and Prior Year Sockeye Salmon Escapement at Tumwater Dam

- The recent declines in Bull Trout within the Entiat River Basin may be related to log jams and other naturally forming barriers to passage, as these features appear to have a significant impact on access to spawning habitats. Nelson and Nelle (2008) observed reductions in spawner abundance in the Entiat River in 2006 due to a natural barrier in Box Canyon and highlighted the frequency of barrier formation within the Mad River as a source of decreased redd counts between 1999 and 2005. Nelson and Nelle (2008) also located a high number of motionless radio telemetry tags suspected to be mortalities within log jams of the Mad River. In the Mad River, 15 of the 23 tags (65 percent) were in log jams: "From 2003 to 2006, 33 tags of the 92 tagged Bull Trout in the Entiat core area were recovered or motionless, including 23 tags of 35 Bull Trout (66 percent) in the Mad River and 10 of 57 Bull Trout (18 percent) in the upper Entiat River. In the Mad River, 15 of the 23 tags (65 percent) were in log jams."

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E.4 PISCIVOROUS BIRDS

TECHNICAL MEMO

To: Public Utility District No. 1 of Chelan County
327 N. Wenatchee Avenue
Wenatchee, WA 98801

From: Von Pope and Kelly Cordell

cc: Ben Truscott, Nathalie Denis

Date: August 2023

Re: Piscivorous Bird Monitoring, Rock Island (2002 – 2021)

ROCK ISLAND HYDROELECTRIC PROJECT

FERC NO. 943

P.U.D.
CHELAN COUNTY

INTRODUCTION

The Public Utility District No. 1 of Chelan County (Chelan PUD) owns and operates the Rock Island hydroelectric project (Rock Island Project) along the Columbia River in central Washington. The Rock Island Dam was built in 1933 and operates under a 40-year license issued by the Federal Energy Regulatory Commission (FERC) (FERC Project No. 943) in 1989. The license incorporates a Rock Island Anadromous Fish Agreement and Habitat Conservation Plan (HCP; Chelan PUD 2002), which, among other things, establishes survival metrics for salmon and steelhead smolt (smolt) migrating through the Rock Island Project on their way to the ocean.

Smolt survival through hydroelectric projects may be affected by a variety of factors, including water quality (Collis et al. 2002), hydraulic flows (Keesee and Hemstrom 2007), and predation (Ruggerone 1986). Smolt predation by a variety of piscivorous bird species is well documented (Zorich et al. 2011; Evans et al. 2016). Upon signature of the HCP, Chelan PUD entered Phase 1 implementation that required a plan and various actions to achieve the survival metrics for salmon and steelhead. Once the HCP survival metrics were achieved for smolts at Rock Island in 2010, Chelan PUD voluntarily agreed to maintain all aspects of Rock Island Project operations, including implementing predator control programs.

This memo summarizes several monitoring and management efforts conducted by the University of Washington (UW) and Chelan PUD to document piscivorous bird abundance and distribution at the Rock Island Project[1] and relates that information to potential avian predation effects. The monitoring and management efforts included:

- A study by UW conducted from 2002 to 2004 to document avian predation (Parrish 2006);
- Routine piscivorous bird surveys by Chelan PUD along the Rock Island Reservoir from 2002-2018;
- Routine piscivorous bird surveys by Chelan PUD at the Rock Island tailrace from 2011-2021;
- Chelan PUD monitoring and management of a waterbird colony in the Rock Island forebay, including Passive Integrated Transponder (PIT) tag recovery efforts (2005-2021); and

[1] Monitoring and management efforts also occurred at the Rocky Reach Project pursuant to the Rocky Reach Anadromous Fish Agreement and Habitat Conservation Plan, which is incorporated into Chelan PUD's FERC license for that project.

- Management efforts implemented by Chelan PUD, including the installation of piling caps on piers along the Rock Island Project, installation, and maintenance of wire arrays in the tailrace, and both indirect (bird wires, hazing, and piling caps) and direct (lethal take) control of piscivorous bird species.

AVIAN PREDATION STUDY (2002-2004)

The purpose of the study was to understand piscivorous bird impacts on salmonid smolts and identify management options within the Rock Island and Rocky Reach Projects (Study Area). The study effort was concentrated on five piscivorous bird species known to frequent the mid-Columbia River and predate salmon smolt: Ring-billed Gulls (*Larus delawarensis*), California Gulls (*Larus californius*), Double-crested Cormorants (*Nannopterum auritum*), Caspian Terns (*Sterna caspia*), and Common Mergansers (*Mergus merganser*) (Parrish 2006).

While 15 species of piscivorous birds were sighted over three years of surveys, gulls and Common Mergansers accounted for almost 85 percent of all sightings (Parrish 2006). Thirty fish species, including four salmonid species, were found in the stomachs of 1,866 birds taken from the Study Area. Overall, piscivorous birds removed less than 1 percent of the estimated salmon smolt populations (by species) moving through the Study Area (Parrish 2006). Most avian predation (>85 percent) on salmonid smolts occurred away from the immediate vicinity of the dams. The study's results suggested that avian predation on salmonid smolts was relatively low, and control efforts successfully reduced bird abundance and foraging efforts in the tailrace at Rock Island Dam (Parrish 2006).

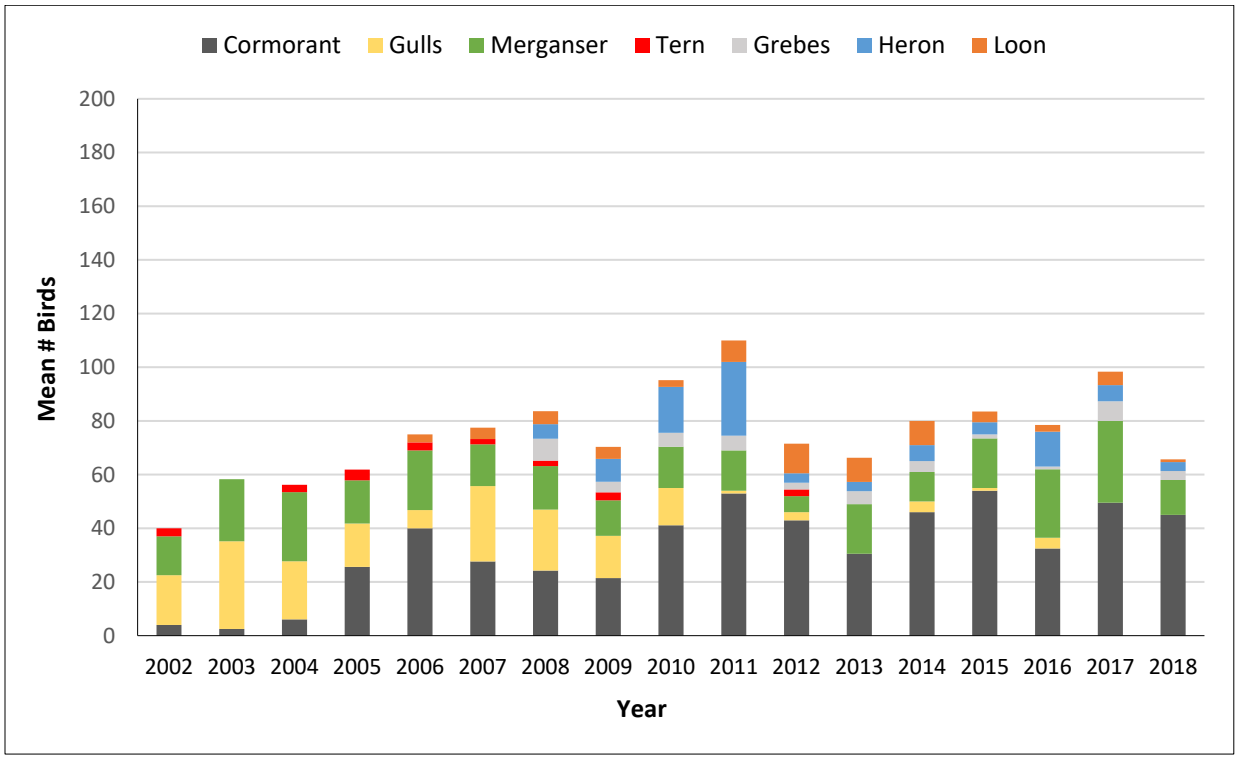
ROCK ISLAND RESERVOIR BIRD MONITORING (2002-2018)

From 2002 to 2010, weekly piscivorous bird surveys were conducted by boat along the length of the Rock Island Reservoir during the outmigration season (April to August), except for 2006, where surveys were conducted every other week. From 2002 to 2004, UW conducted the surveys; beginning in 2005, Chelan PUD conducted the surveys using the same methodology.

In 2011, Chelan PUD decreased the piscivorous bird monitoring to monthly surveys. The last piscivorous bird monitoring effort along the Rock Island Reservoir was conducted in 2018. Due to the consistency in the trends observed throughout the monitoring effort, the piscivorous bird monitoring surveys were discontinued after 2018.

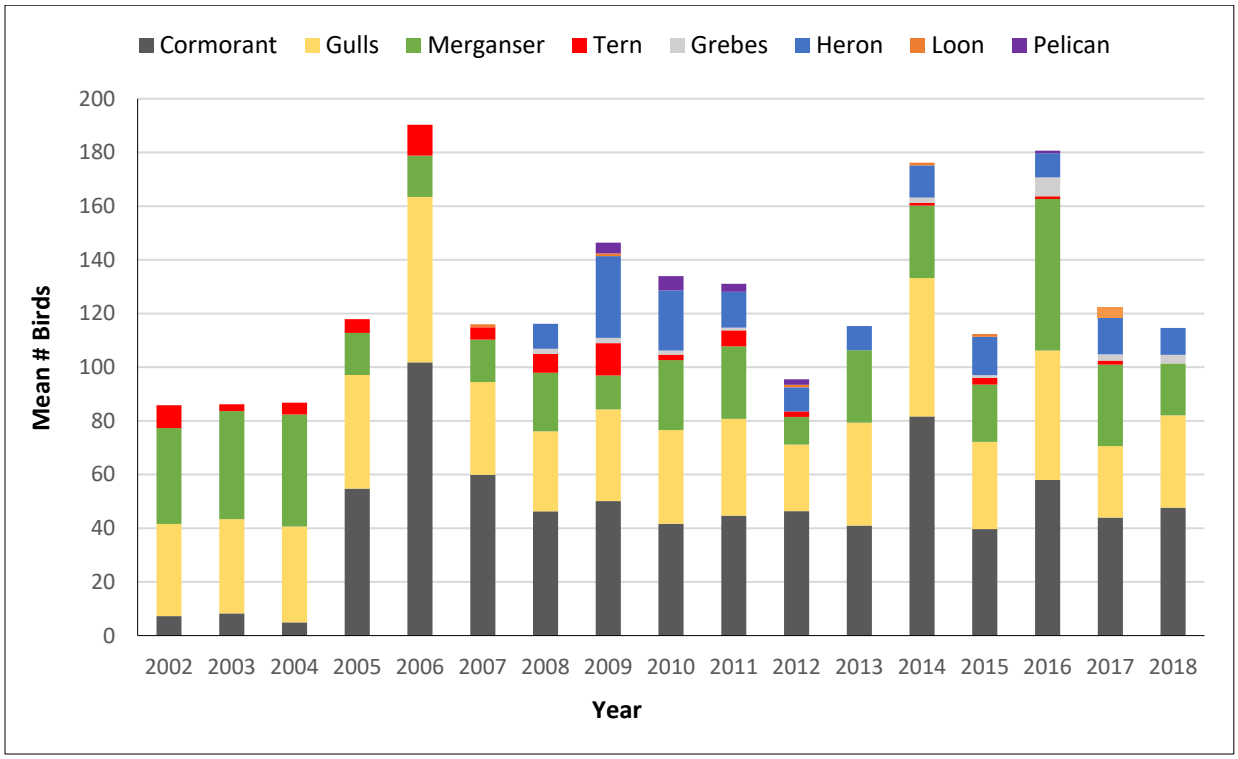
From 2002 to 2018, 212 surveys were conducted along the Rock Island Project. The species composition and temporal and spatial distribution of piscivorous birds documented by Chelan PUD surveys from 2005-2018 were similar to results reported by UW from 2002 to 2004. However, the

Chelan PUD monitoring included grebes (Pied-billed, Western, and Horned), Great Blue Herons, Common Loons, and American White Pelicans, which were not monitored in the UW survey effort. Changes in overall piscivorous bird species abundance and proportions were observed over the entire study period (Figure 1 and Figure 2). Early in the smolt migration period (April to mid-June), piscivorous bird abundance was low, with an average of 68.1 birds per survey. Common Mergansers and Double-crested Cormorants were the dominant species during the early period (Figure 1), particularly after 2005. During the late smolt migration period (mid-June to August), average piscivorous bird abundance increased 52.1 percent to 103.6 birds per survey (Figure 2). While the species composition remained similar between the early and late periods (American White Pelicans were only observed in the late period), average gull abundance increased by 150 percent and was the primary cause of the increase in average piscivorous bird abundance between the early and late seasons.



Source: Pope and Cordell 2023
Note: Early period = April to mid-June

Figure 1. Annual Average Piscivorous Bird Numbers Type for the Early Period, Rock Island Reservoir, 2002-2018

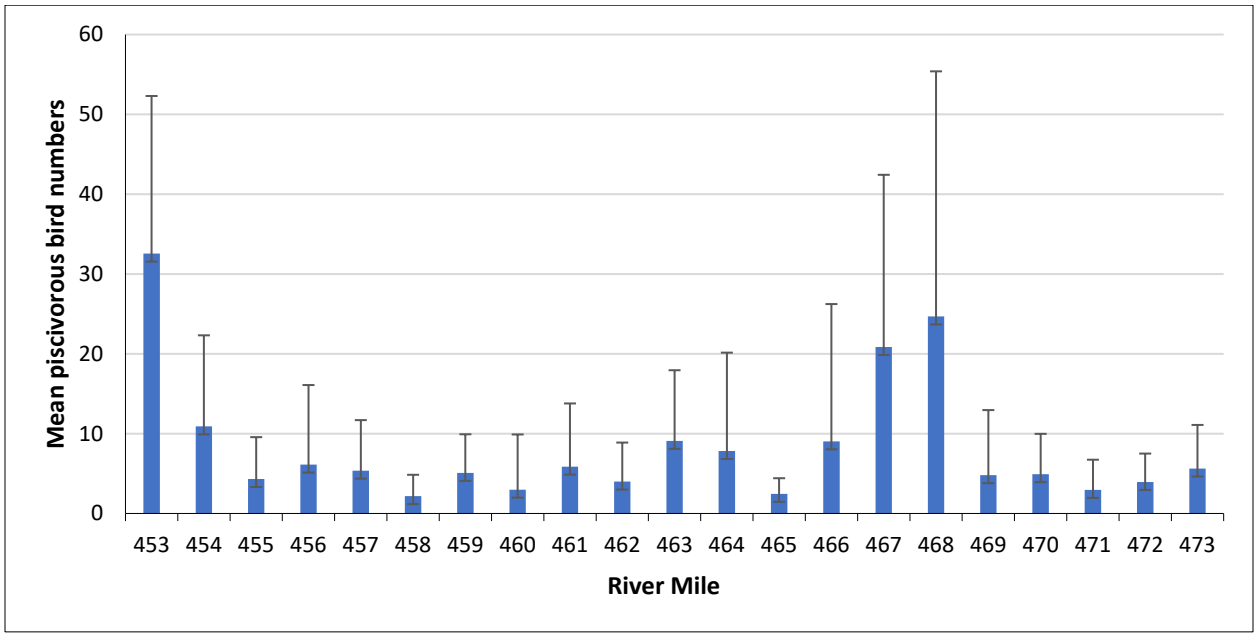


Source: Pope and Cordell 2023
Note: Late period = mid-June to August

Figure 2. Annual Average Piscivorous Bird Numbers Type for the Late Period, Rock Island Reservoir, 2002-2018

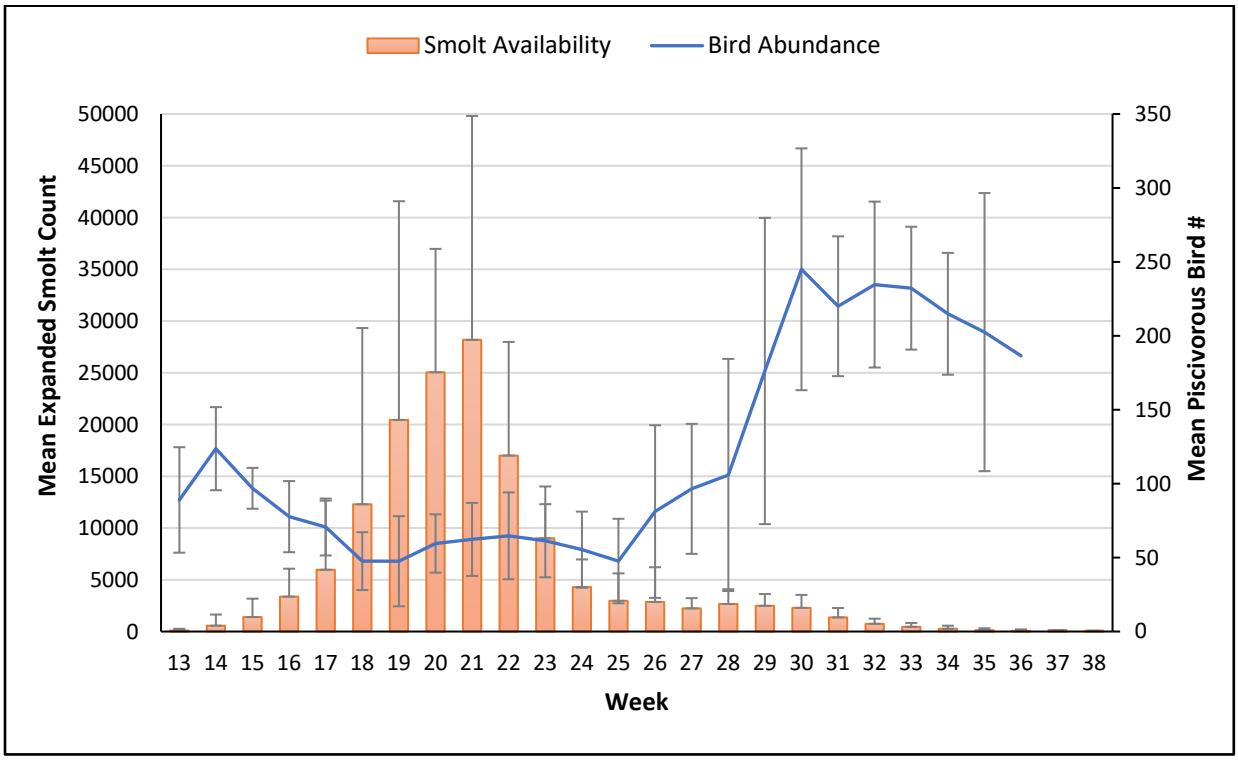
Between 2002 and 2018, the spatial distribution of piscivorous birds along the Rock Island Reservoir was relatively low, with a few exceptions (Figure 3). The largest concentration of birds was consistently near the Rock Island Dam, at United States Geological Survey (USGS) river mile (RM) 453, where an average of 32.6 piscivorous birds per survey were observed for all years. Higher concentrations of piscivorous birds were also observed between USGS RM 467 and 468, where higher averages of piscivorous birds were observed for all years (Figure 3). These higher averages and large standard deviations for the survey period are primarily related to the numbers of roosting and breeding piscivorous birds in the Rock Island forebay area (USGS RM 468) and large concentrations of gulls in Walla Walla Park (USGS RM 467) and the confluence of the Wenatchee and Columbia Rivers (USGS RM 468).

The UW avian predation study (Parrish 2006) demonstrated that avian predation does occur at the Rock Island Project; however, the overall effect is relatively small due to the temporal differences in piscivorous bird and smolt abundance at Rock Island (Figure 4). Since relatively few avian predators are present during the early smolt migration period, avian predation effects are limited compared to when avian predators (gulls) increase in July (weeks ~26 to 31), but the number of available smolts has decreased by then.



Note: Error bars represent standard deviation.

Figure 3. Average Piscivorous Bird Abundance by River Mile in the Rock Island Reservoir, 2002-2018



Source: Pope and Cordell 2023

Note: Error bars represent standard deviation.

Figure 4. Smolt Availability and Bird Abundance at the Rock Island Project, 2006 to 2018

ROCK ISLAND TAILRACE PISCIVOROUS BIRD MONITORING (2011 TO 2021)

In 2011, Chelan PUD voluntarily began daily monitoring of piscivorous birds during the smolt migration season in the Rock Island Project tailrace to collect specific information regarding piscivorous bird species abundance, as smolt predation is often associated with the tailrace of hydroelectric dams (Evans et al., 2016) and routine reservoir surveys did not include the Rock Island Project tailrace.

From April 1 to August 31 between 2011 and 2021, up to three separate counts of piscivorous bird species (or species groups) were conducted daily (between 8:00 and 15:00) in the Rock Island Project tailrace. The daily maximum count (or zero if none were observed) for each piscivorous bird species (or species group) was recorded. Chelan PUD recorded 1,633 daily maximum counts of piscivorous birds and found low abundance in the Rock Island Project tailrace. For all piscivorous bird species or species groups, the median number of piscivorous birds observed for all years was one bird per day, while the mean was 1.6 birds per day, and the maximum was 66 birds per day.

When examined by month, nearly half of the daily maximum counts of birds observed in the Rock Island Project tailrace were observed in May (41 percent - see Figure 5). April had the second-highest frequency of maximum daily counts (27 percent), while the remaining 32 percent of daily maximum counts were spread over June, July, and August (Figure 5).

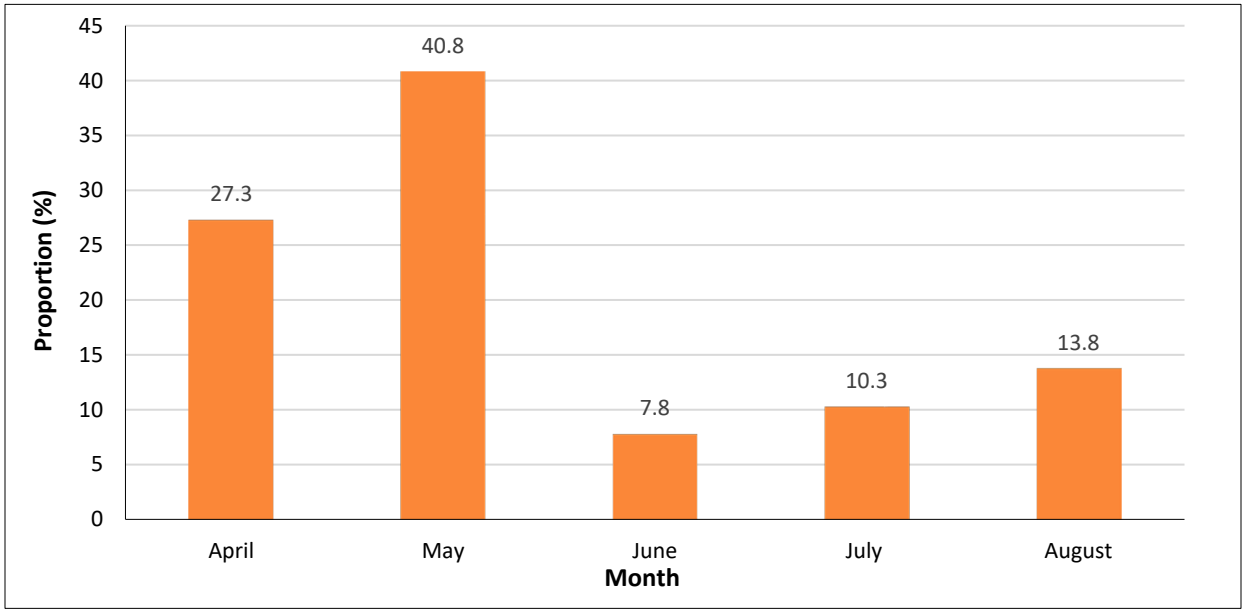


Figure 5. Frequency Distribution of Daily Maximum Count of all Piscivorous Birds Combined by Month at the Rock Island Project Tailrace (2011-2021)

While the overall bird abundance in the Rock Island Project tailrace was low, the temporal distribution of piscivorous birds in the Rock Island Project tailrace was opposite of the reach survey findings, with more piscivorous birds in the tailrace in the spring and early summer. Table 1 shows the daily maximum count for all species or species groups by year and the occurrence frequency for the entire Rock Island Project tailrace survey period. On an annual basis, piscivorous bird species composition in the Rock Island Project tailrace was similar to the reservoir reach surveys, including Common Mergansers, Great Blue Herons, and Double-crested Cormorants (Table 1).

Table 1. Daily Maximum Counts by Species, or Species Groups, by Year and the Occurrence Frequency (% of Occurrence on all Counts) at the Rock Island Project Tailrace, 2011 to 2021

YEAR	COMMON MERGANSER	GREAT BLUE HERON	DOUBLE-CRESTED CORMORANT	GULL/TERN	GULLS	CASPIAN TERN	GREBES	COMMON LOON	AMERICAN WHITE PELICAN
2011	7	3	3	28	nd	nd	0	0	0
2012	29	2	4	43	nd	nd	1	0	0
2013	6	1	10	4	nd	nd	0	1	0
2014	16	2	3	nd	8	1	0	1	0
2015	13	3	9	nd	34	1	0	1	0
2016	4	2	3	nd	17	1	0	1	5
2017	7	5	5	nd	1	1	0	0	0
2018	4	4	2	nd	3	0	1	0	0
2019	15	2	6	nd	3	1	0	0	0
2020	10	2	3	nd	5	1	0	0	0
2021	12	2	2	nd	3	3	1	0	0
Occurrence Frequency	33.9	24.5	12.8	23.1	4.9	0.4	0.1	0.2	0.2

nd = no data collected

MONITORING AND MANAGEMENT OF WATERBIRD COLONIES IN THE ROCK ISLAND PROJECT

In addition to the avian predation documented by UW (Parrish 2006), evidence of predation had been documented at waterbird (Double-crested Cormorant and Great Blue Heron) roosting and breeding colonies in the Rock Island Project. In 2006, Chelan PUD began routine monitoring and management of waterbird colonies in the Rock Island Project in an effort to understand and reduce smolt predation by nesting cormorants.

The avian predation study (Parrish 2006) noted that while Double-crested Cormorants existed in relatively low numbers during the study, their smolt consumption rates were among the highest per bird in the study. As a result, Chelan PUD began conducting evening roost counts at the known waterbird colony in the Rock Island forebay. Double-crested Cormorants at this location ranged from 0 to 247 during evening roost counts (n = 230) between 2006 and 2021. Double-crested Cormorant abundance was low during the winter months and peaked in late summer.

Since the early 2000s, the constant presence of Double-crested Cormorants in the Rock Island forebay has been managed by Chelan PUD and the United States Department of Agriculture (USDA) Wildlife Services (under contract with Chelan PUD) using both indirect (hazing) and direct (take) methods. Indirect methods included hazing with cracker shells and propane cannons and placing perch deterrents in the towers. Chelan PUD also contracted with the USDA Wildlife Services to conduct lethal control in conjunction with federal take permits. Between 2006 and 2021, the USDA lethally removed 1,643 Double-crested Cormorants from the Rock Island forebay. Double-crested Cormorants were removed to reduce nesting attempts in the lattice transmission towers and smolt predation.

In addition to Double-crested Cormorants, Great Blue Herons used the natural trees and lattice towers in Rock Island forebay for nesting. A second Great Blue Heron breeding colony was active from 2009 to 2012 on the Chelan County side of the Rock Island Project near Stemilt Creek.

PIT tags, presumably from fish eaten by piscivorous birds, are often deposited in waterbird colonies (Collis et al. 2001 and Evans et al. 2012). From 2007 to 2021, Chelan PUD recovered and read 9,633 PIT tags from these waterbird colonies in the Rock Island Project.

PIT tags were only recovered from the concrete islands with four lattice transmission towers in the Rock Island forebay. PIT tags could not be recovered from the natural island with five lattice transmission towers due to the natural substrate (rock) and vegetation cover, so PIT tags were only read from this island. Similarly, due to vegetation cover, PIT tags were not recovered from the Great Blue Heron colony near Stemilt Creek. Annually, PIT tags are read and recovered from the concrete islands, and any duplicate tags over the years are removed. PIT tag numbers reported are from direct PIT tag reads or recoveries; no PIT tag detection or deposition rates are available to correct any potential missed PIT tags.

Of the 9,633 PIT tags read or recovered, 540 of these PIT tags were unreadable (i.e., broken, or inactive) or had no associated data in the PIT Tag Information System, (PTAGIS) leaving 9,093 PIT tags with related fish species information. While 89.8 percent of these 9,093 PIT tags were from PIT-tagged salmon (75.1 percent) and steelhead (14.7 percent) smolts, only 16.8 percent of these

smolts were tagged and released by Chelan PUD under the Rocky Reach and Rock Island HCPs hatchery programs.

In most cases, determining when and where the avian predation events occurred was not possible. However, it is worth noting that information from 13.8 percent of the PIT tags read or recovered were from smolts released in Columbia River tributaries below Rock Island Dam, including smolts released into the Salmon, Snake, Umatilla, and Yakima rivers. This suggests that while the bird colonies are located along the Rock Island Project, avian predation occurs over a much larger area.

PISCIVOROUS BIRD MANAGEMENT EFFORTS

One of the tools implemented under Phase 1 was an aggressive predator control program for piscivorous bird populations to reduce mortality to smolts from avian foraging during the outmigration season. Specifically, piscivorous birds, which include Caspian Terns, Double-crested Cormorants, and various gull species, were hazed through techniques including wire arrays in the tailrace, propane cannons, pyrotechnics, lethal control, and perching deterrents.

Photo 1 shows the configuration of bird wires at the Rock Island Project tailrace. The wire array deters plunge foraging on smolts by piscivorous birds (i.e., gulls and terns) in the Rock Island Project tailrace.

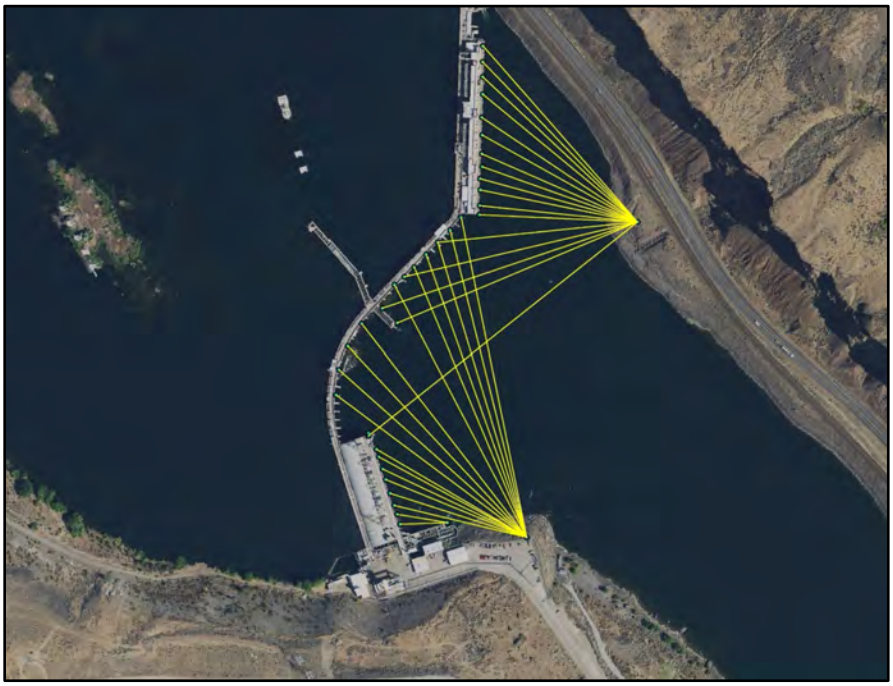


Photo 1. Current Rock Island Project Bird Wire Array

In the summer of 2005, 118 piling caps were installed on dock pilings at public parks along both the Rocky Reach and Rock Island reservoirs. Piling caps were placed on dock and swim area pilings with flat surfaces that allowed gulls and terns to perch (Photo 2). The piling caps deter birds from using pilings as perches, thus reducing the availability of overwater perches from which gulls and terns plunge to prey on fish, including smolts. After the piling cap installation, many gulls were seen loafing in shady spots on the grass or along the beaches. No birds have been observed perching on the piling caps since their installation.

Photo 2. Swim Bay Pilings with Pyramid Perch-diverters Installed, 2006

CONCLUSIONS

Chelan PUD continues to conduct a variety of piscivorous bird monitoring and management activities that directly reduce predation on out-migrating salmon and steelhead smolts and likely contribute to the achievement of HCP survival metrics. Shortly after the HCP was executed, Chelan PUD contracted with the UW to conduct an avian predation study. Results of that study showed that while smolt consumption occurs at the Rock Island Project, avian predation is not a significant source of mortality (Parrish 2006). Routine monitoring of piscivorous bird species along the Rock Island Project shows that piscivorous bird numbers are relatively low early in the smolt migration season when the majority of smolts migrate through the area. The inverse relationship between piscivorous birds and smolt abundance dramatically reduces the risk of avian predations for smolts that migrate early in the season. For smolts that migrate later in the season, when piscivorous bird abundance is much higher, Chelan PUD has employed management actions to reduce predation

impacts by piscivorous birds, including wire arrays in the Rock Island Project tailrace, piling caps on dock and swim bay pilings, and active hazing or direct control of piscivorous bird species at the Rock Island Project facilities.

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E.5 BLACK COTTONWOOD IMAGERY

TECHNICAL MEMO

To: Public Utility District No. 1 of Chelan County
327 N. Wenatchee Avenue
Wenatchee, WA 98801

From: Kelly Cordell and Von Pope

cc: Ben Truscott, Nathalie Denis

Date: May 2023

Re: Black Cottonwood Aerial Imagery Review

ROCK ISLAND HYDROELECTRIC PROJECT

FERC NO. 943

INTRODUCTION

Pockets of riparian communities exist in the Rock Island Project Boundary. Many of these riparian pockets include stands of native black cottonwood (*Populus balsamifera ssp. trichocarpa*). These black cottonwood trees exist:

- Between the upslope, developed, or agricultural sites and the shoreline;
- In areas of undeveloped shoreline; and
- In a variety of stand sizes and size structures.

The patch size, extent, and size structure of the black cottonwood stands within the Rock Island Project Boundary had not been previously described. During 2022, Public Utility District No. 1 of Chelan County (Chelan PUD) conducted a field inventory of black cottonwood stands in the Rock Island Project Boundary to establish baseline data and to determine if the National Land Cover Database GIS data accurately represents black cottonwood stands in the Rock Island Project Boundary.

METHODS

Biologists mapped individual black cottonwood stands as polygons using ArcGIS Collector on an iPad in the field and assigned each black cottonwood stand a minimum of one Stand Class based on tree diameter at breast height (dbh) as observed in the field as such:

- Establishing: <4 in. dbh
- Sub-mature: 4-12 in. dbh
- Mature: ≥12 in. dbh

A polygon was created if there was one or more cottonwood trees observed. Stand classes consisted of three categories based on tree diameter. Some stands contained more than one Stand Class, thus were categorized with multiple stand classes.

Using GIS (ArcGISPro), the black cottonwood Stand Class polygon data was overlaid with the National Land Cover Database (NLCD) 30m raster dataset obtained from the Multi-Resolution Land Characteristics Consortium (MRLC 2022). A new polygon was created for analysis using these datasets and the Rock Island Project Boundary.

The NLCD dataset includes 15 categories of land uses (USGS 2019) that were then summarized into seven major categories within the Rock Island Project Boundary:

- Agriculture (including Pasture/Hay and Cultivated Crops/Irrigated Agriculture);
- Open Water;
- Developed (including Open Space, Low, Medium, and High intensity);
- Columbia Basin Foothills and Canyon Dry Grasslands;
- East Cascades Oak-Ponderosa Pine Forest and Woodland (includes Columbia Basin Foothill Riparian Woodland and Shrubland);
- Inter-mountain Basins Big Sagebrush (includes Shrubland and Steppe, Inter-mountain Basins Alkaline Closed Depression, and Inter-mountain Basins Greasewood Flat); and
- Recently Logged or Burned.

These seven categories were compared to the black cottonwood polygons to ascertain if the land cover dataset was a good predictor of black cottonwood stands within the Rock Island Project Boundary.

RESULTS

A total of 139 individual black cottonwood polygons were mapped, representing 89.2 acres of black cottonwood stands (Figure 1). The black cottonwood polygons were summarized by acres of each Stand Class type. Table 1 shows the total number of acres for each cottonwood Stand Class.

Table 1. Number of Acres and Relative Percentage of Black Cottonwood Stand Class Within the Rock Island Project Boundary

BLACK COTTONWOOD STAND CLASS	ACRES	PERCENT
Mature Stand	34.2	38.3
Mature and Sub-mature Stand	30.9	34.7
Mixed Stand: all three age classes	8.2	9.2
Establishing and Sub-mature Stand	8.7	9.8
Establishing Stand	4.6	5.2
Sub-mature Stand	2.5	2.8
Total	89.2	100%

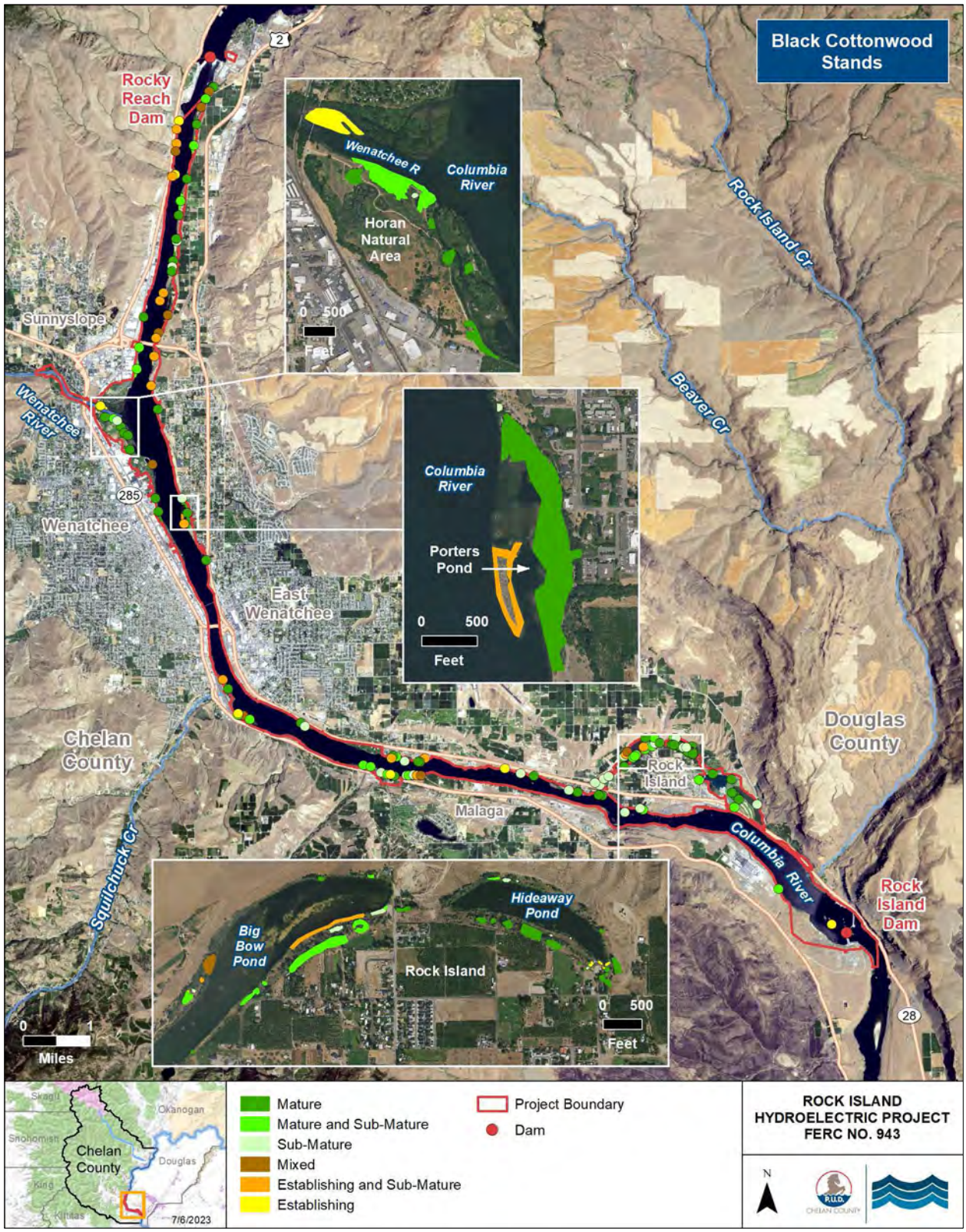

Figure 1. Black Cottonwood Stands Within the Rock Island Project Boundary

Mature stands and Mature and Sub-mature stands comprised the most acreage for all stand classes with 34.2 acres (38.4 percent) and 30.9 acres (34.7 percent), respectively, followed by Mixed-age stands (all three size classes) with 8.2 acres (9.2 percent), and patches of Establishing and Sub-mature stands with 8.7 acres (9.8 percent) (Table 1). Establishing and Sub-mature stands had the least amount of acreage, with 4.6 acres (5.2 percent) and 2.5 acres (2.8 percent) respectively (Table 1). An additional combination of stand class, Mature and Establishing, was not observed within the Rock Island Project Boundary during the survey effort.

The largest single black cottonwood stand was mapped in the Porters Pond area, covering 12.2 acres and 13.7 percent of all stands mapped. The next largest black cottonwood stands mapped were almost half the size of the Porters Pond stand, with 6.5 and 6.4 acres each at the Baker Flats area and in the Horan Natural Area, respectively.

A total of eight black cottonwood stands were mapped in the Horan Natural Area, representing 14.8 acres and 16.6 percent of the total acres mapped in the Rock Island Project Boundary. The Porters Pond area has three stands totaling 14.0 acres (15.7 percent). The Rock Island Ponds area has the highest number of black cottonwood stands, with 53 stands (38.1 percent of all stands), but the stands are relatively small, covering only 8.2 acres (9.0 percent) overall. Most stands mapped in the Rock Island Ponds area are around Big Bow and Hideaway ponds, with 40 stands (75.5 percent of stands mapped in the Rock Island Ponds area). The area north of Highway 2 (Odabashian Bridge) along the Columbia River also contains a large number of black cottonwood stands (26) that cover a large area (30.4 acres), representing 34.1 percent of the total stand area mapped (Table 2). This reach includes two larger black cottonwood stands within the Rock Island Project, measuring 6.5 acres at Eagle Grove and 5.8 acres at Baker Flats.

Table 2. Large Black Cottonwood Stands by Location, Acreage, and Relative Percentage of all Stands Mapped Within the Rock Island Project Boundary

LARGE STAND LOCATION	# POLYGONS	ACRES	PERCENT
North of Odabashian Bridge	26	30.4	34.1%
Horan Natural Area	8	14.8	16.6%
Porters Pond	3	14.0	15.7%
Rock Island Ponds (all)	53	8.2	9.2%

Black cottonwood stands were observed most often between the upslope agricultural or developed sites and the shoreline, in areas of undeveloped shoreline, and in small stands of riparian habitat.

The NLCD dataset significantly underestimates black cottonwood within the Rock Island Project Boundary. Of the stands, 57 percent were mischaracterized as developed lands (28 percent),

agriculture (15 percent), and open water (14 percent). An additional 32 percent of those stands are classified as East Cascades Pine/Oak Forest, which represents riparian habitat but is not specific to black cottonwood (Figure 2).

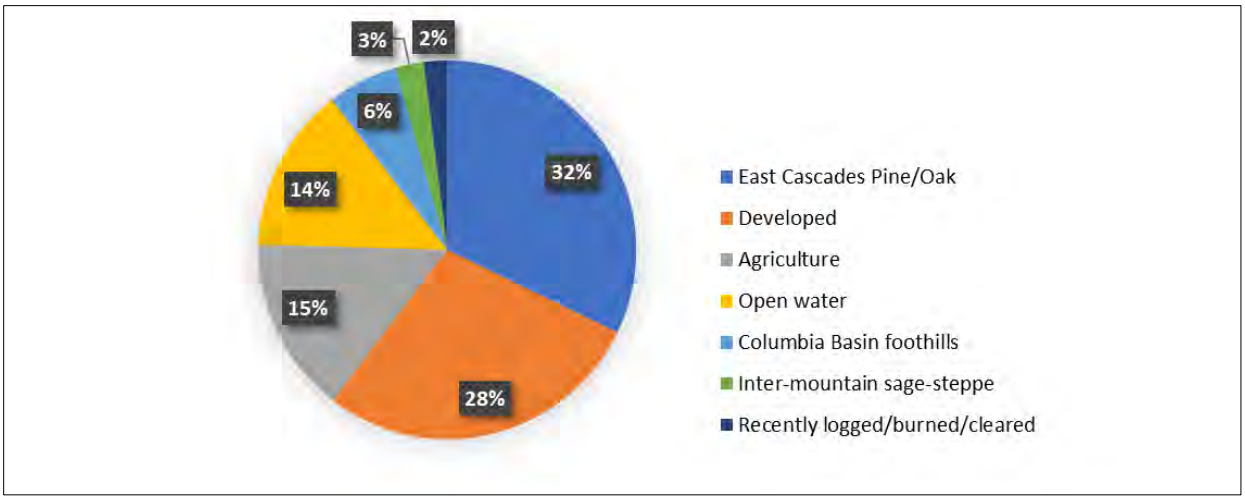

Figure 2. Cottonwood Stand Polygons as Defined by NLCD Dataset

The NLCD dataset classifies most of the riparian habitat in the Rock Island Project Boundary as East Cascades Pine/Oak Forest; however, native white oaks (*Quercus garryana*) do not occur in the Rock Island Project Boundary. The majority of the riparian trees are comprised of ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), maple (*Acer* spp.), black locust (*Robinia pseudoacacia*), and Siberian elm (*Ulmus pumila*) in addition to black cottonwood. The riparian shrub component within the Rock Island Project Boundary is typically comprised of willow (*Salix* spp.), alder (*Alnus* spp.), birch (*Betula* spp.), and Rocky Mountain juniper (*Juniperus scopulorum*).

CONCLUSION

The field survey successfully documented black cottonwood stands in the Rock Island Project Boundary. The black cottonwood stands cover a large area, spatially distributed throughout the Rock Island Project Boundary, with diverse age classes.

Results of the baseline data collected compared to the NLCD dataset demonstrate that the NLCD dataset is a poor predictor of black cottonwood stands within the Rock Island Project Boundary, with 57 percent of black cottonwood polygons misclassified as either developed, agricultural, or open water designations. This known limitation is indicated in the metadata for the GAP/LANDFIRE Terrestrial Ecosystem dataset (USGS 2019). Riparian communities are known to be frequently misclassified due to their patchy nature and small extents, as the minimum mapping unit is 1 acre

for the 30m raster dataset, which is too large of a scale to accurately capture the patchy nature of the black cottonwoods in the riparian community within the Rock Island Project Boundary.

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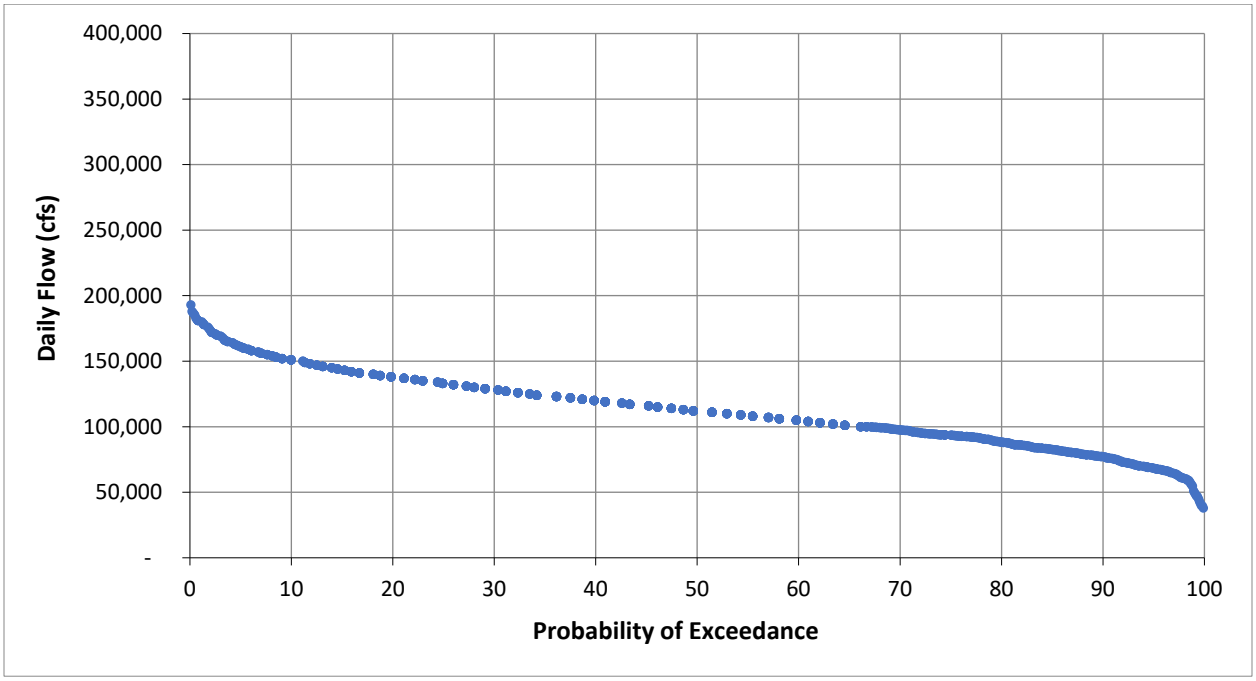
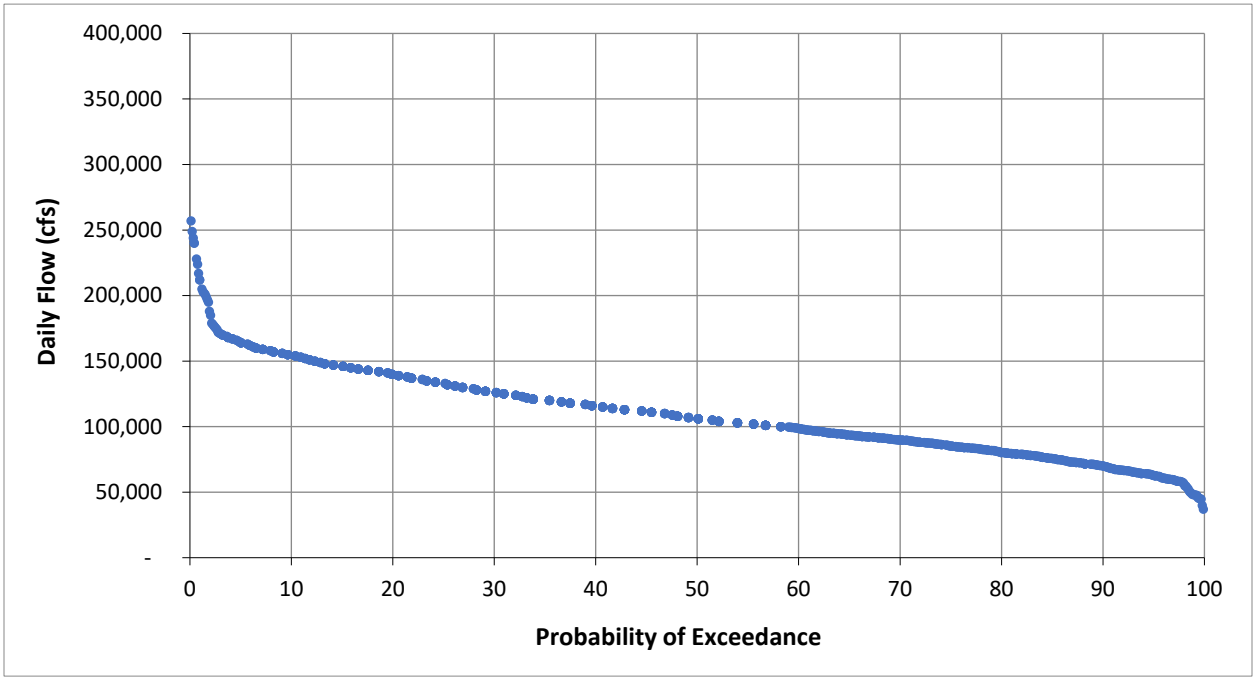
APPENDIX F MONTHLY FLOW DURATION CURVES



January Flow Duration Curve for Columbia River Below Rock Island Dam, WA, USGS Gage 12462600 (1988-2020)



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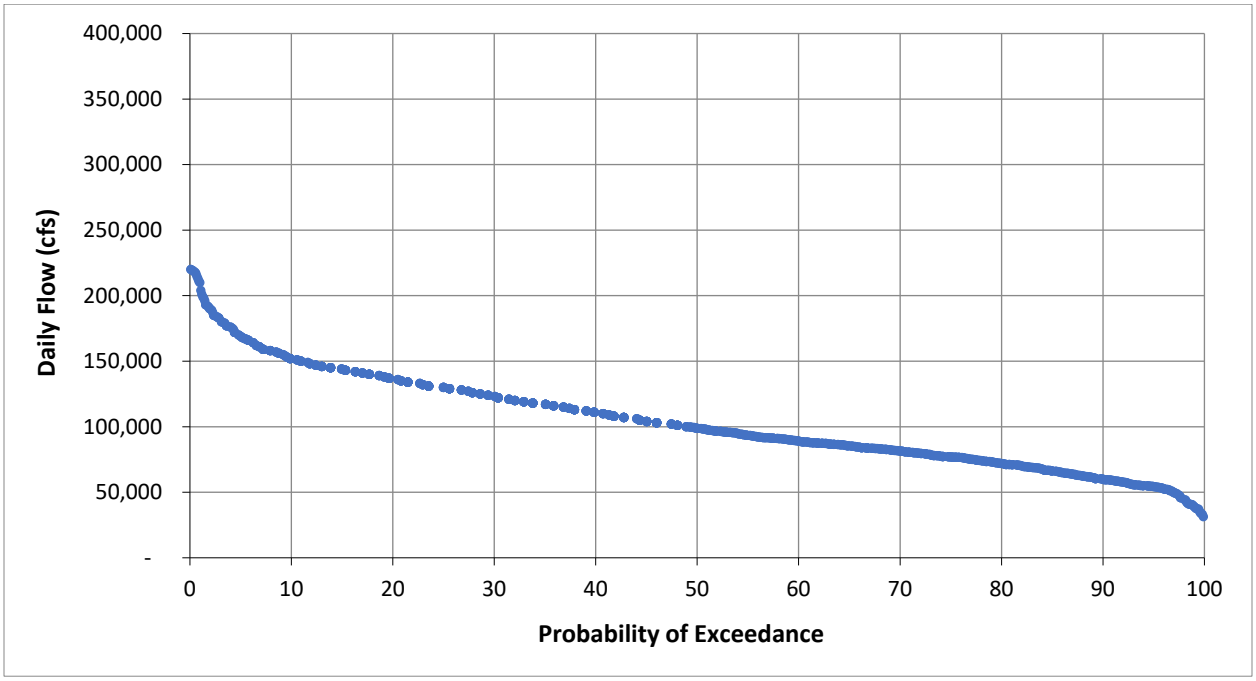

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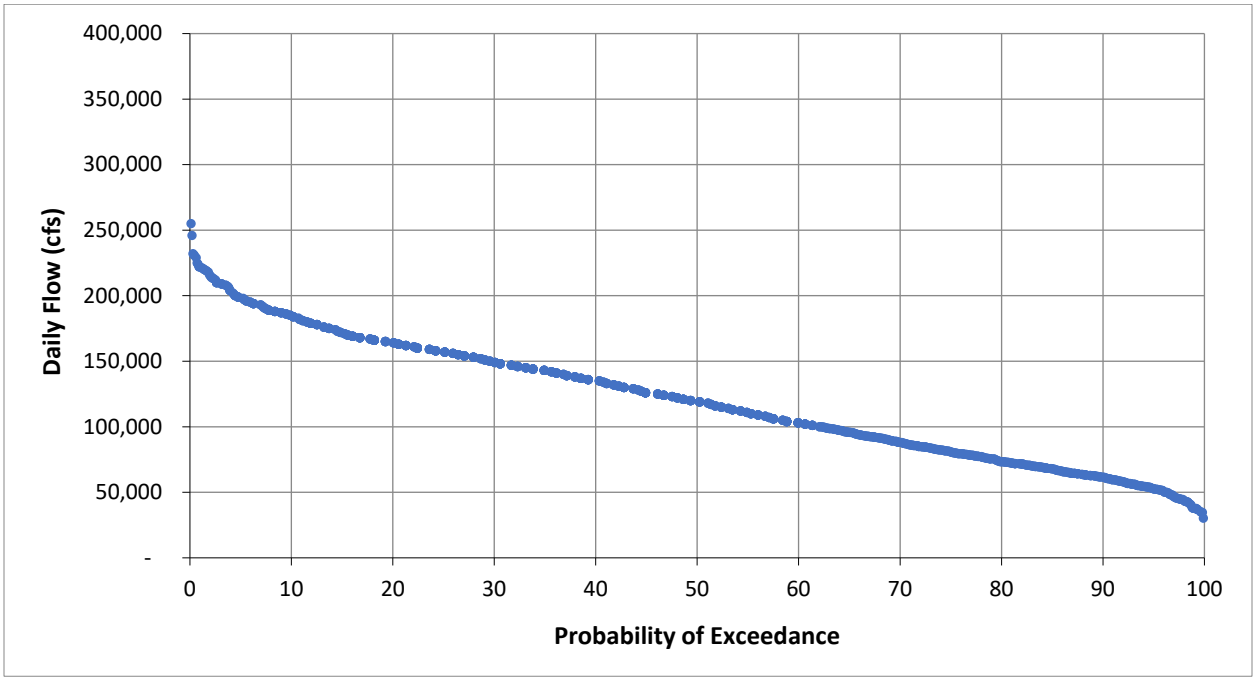

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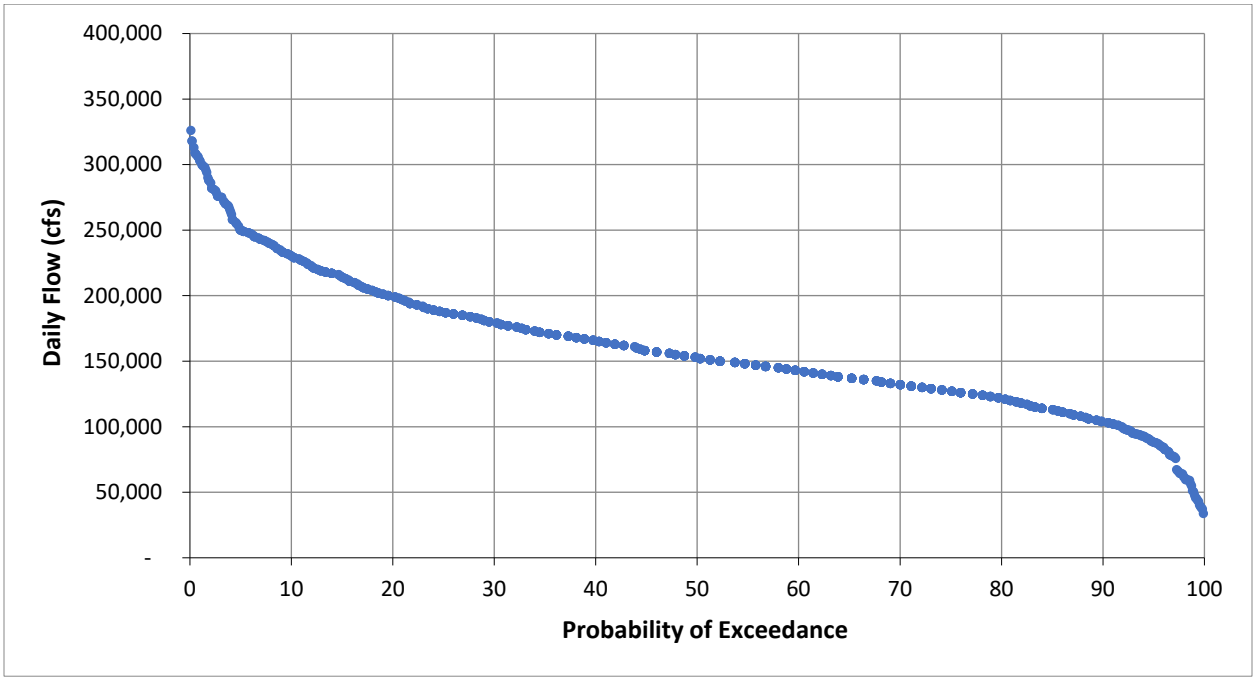

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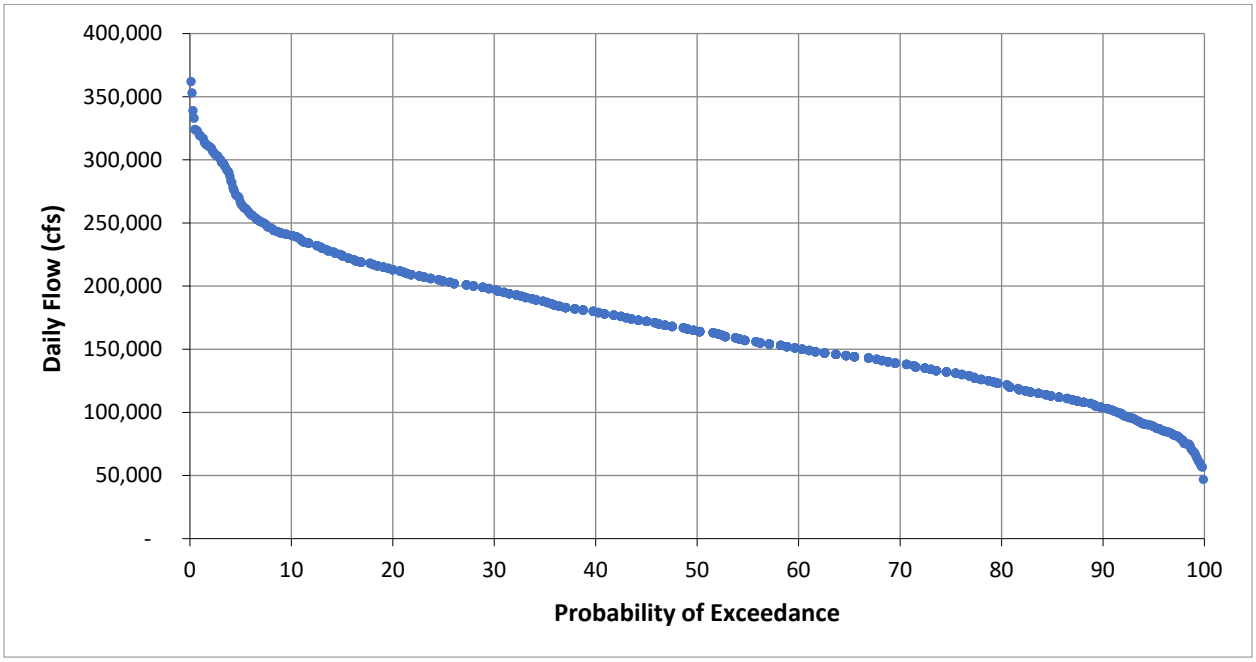

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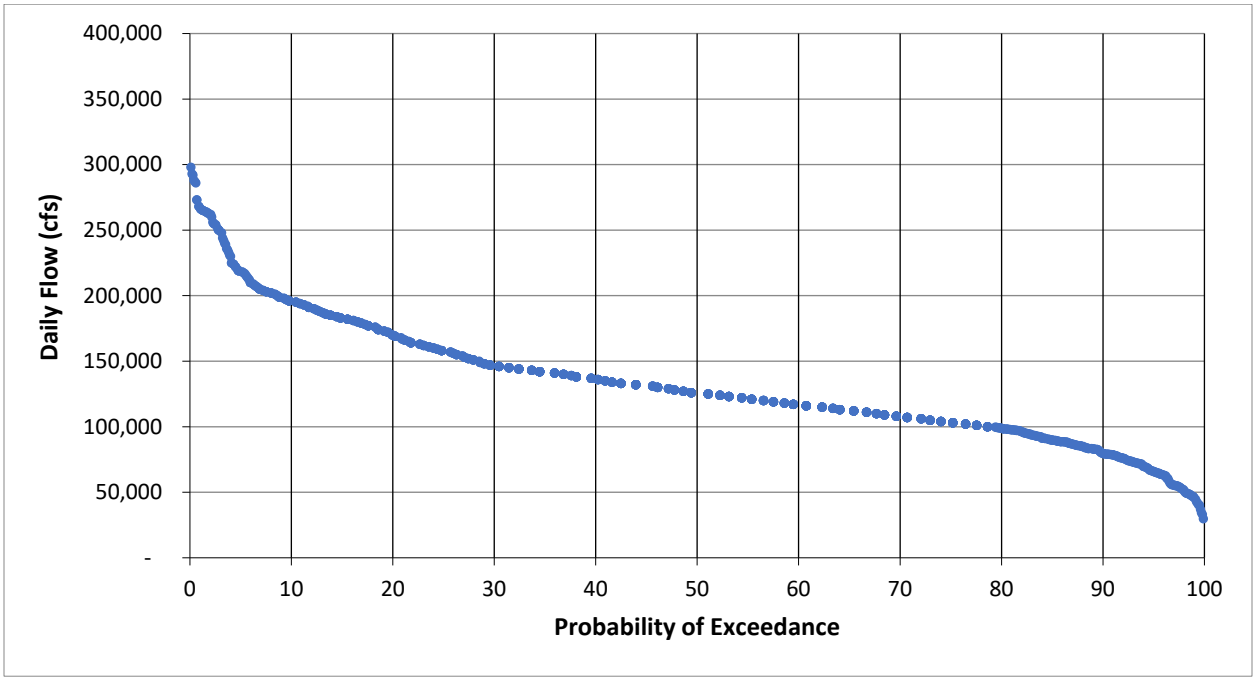

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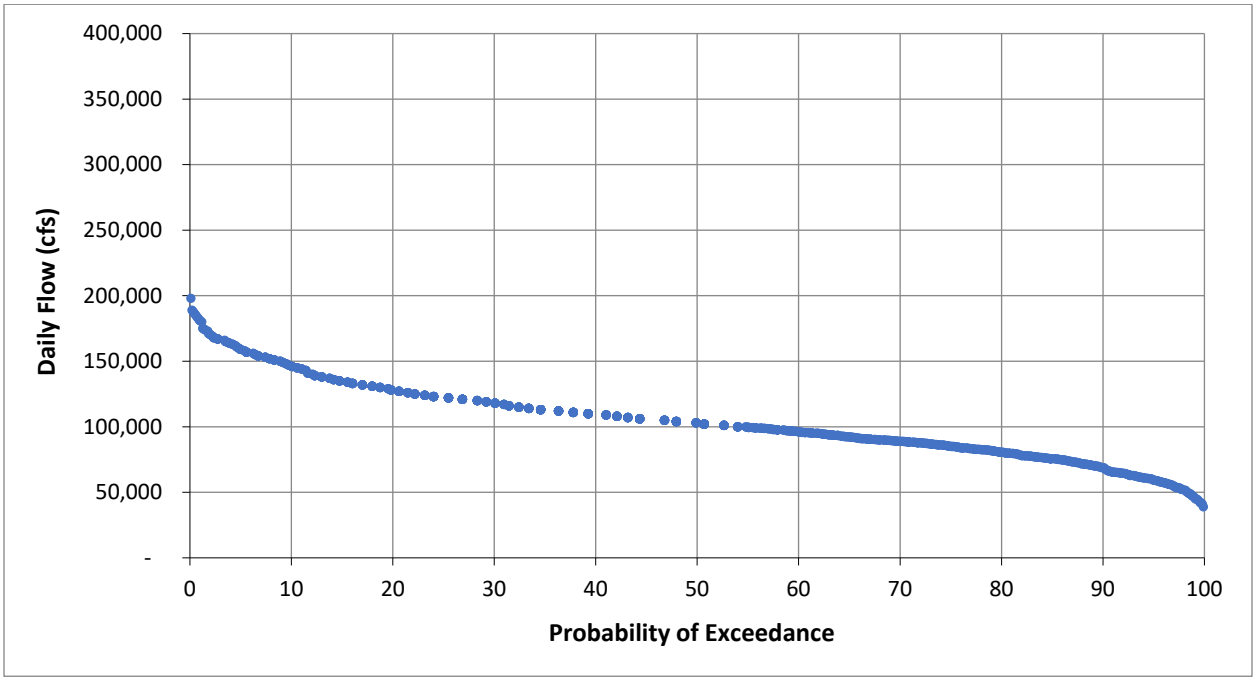

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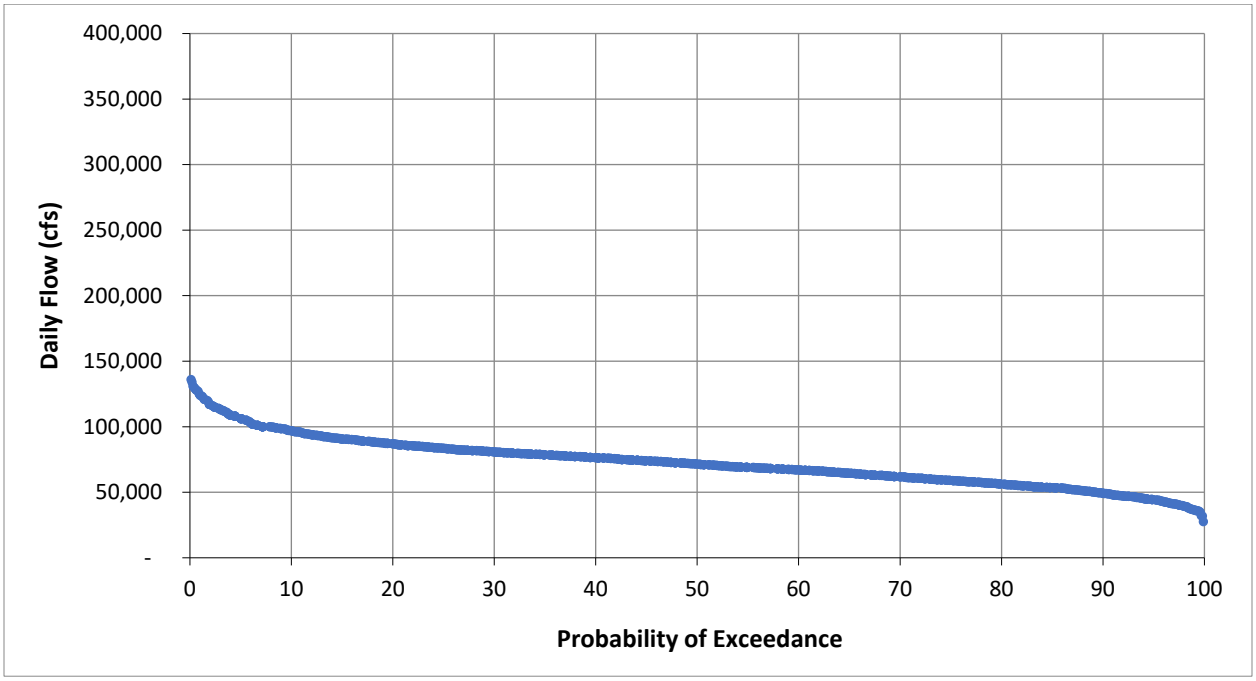

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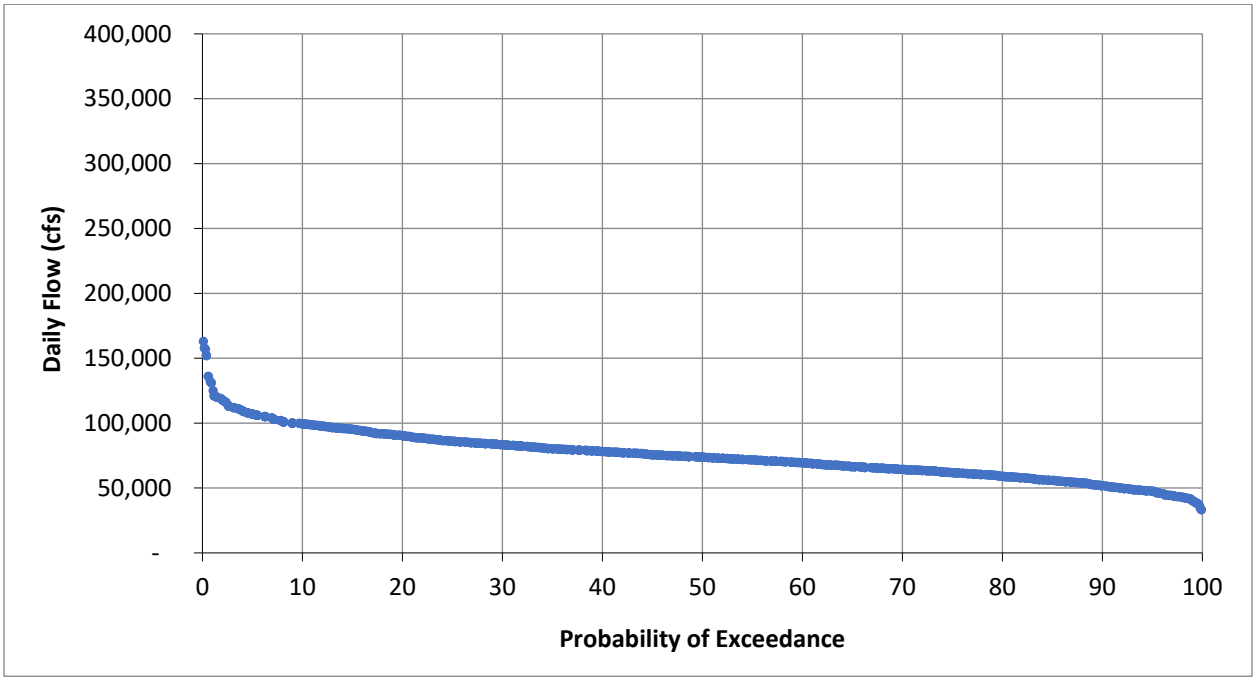

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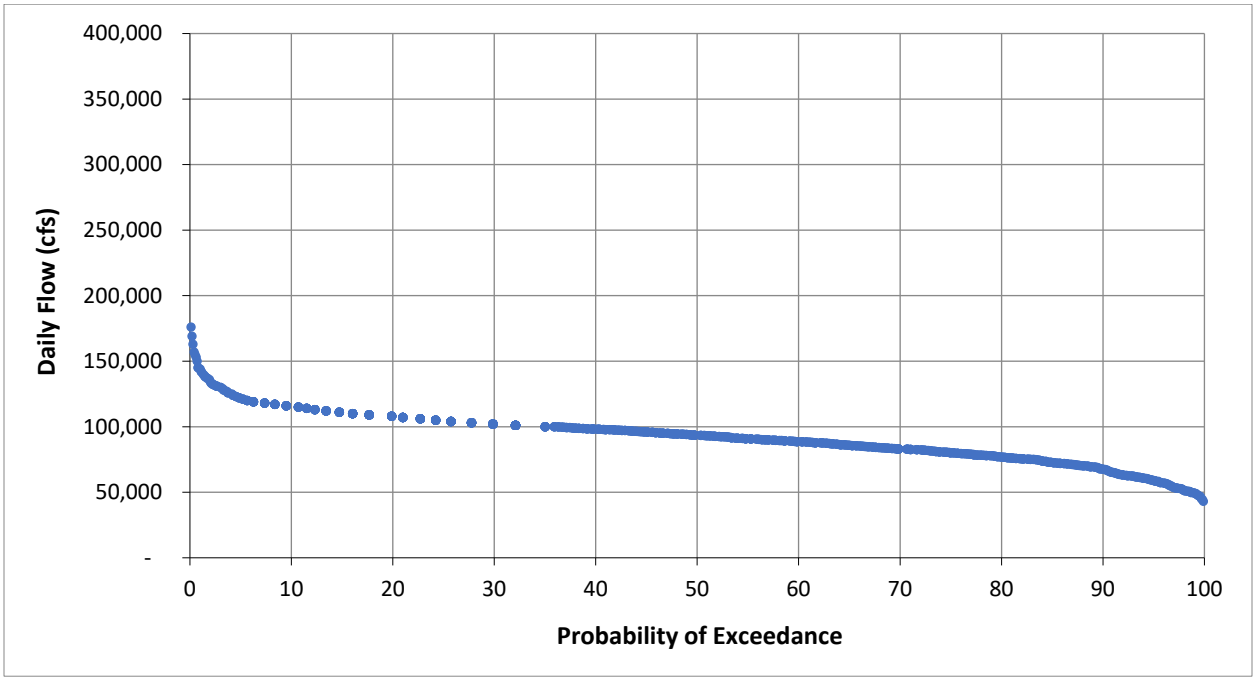

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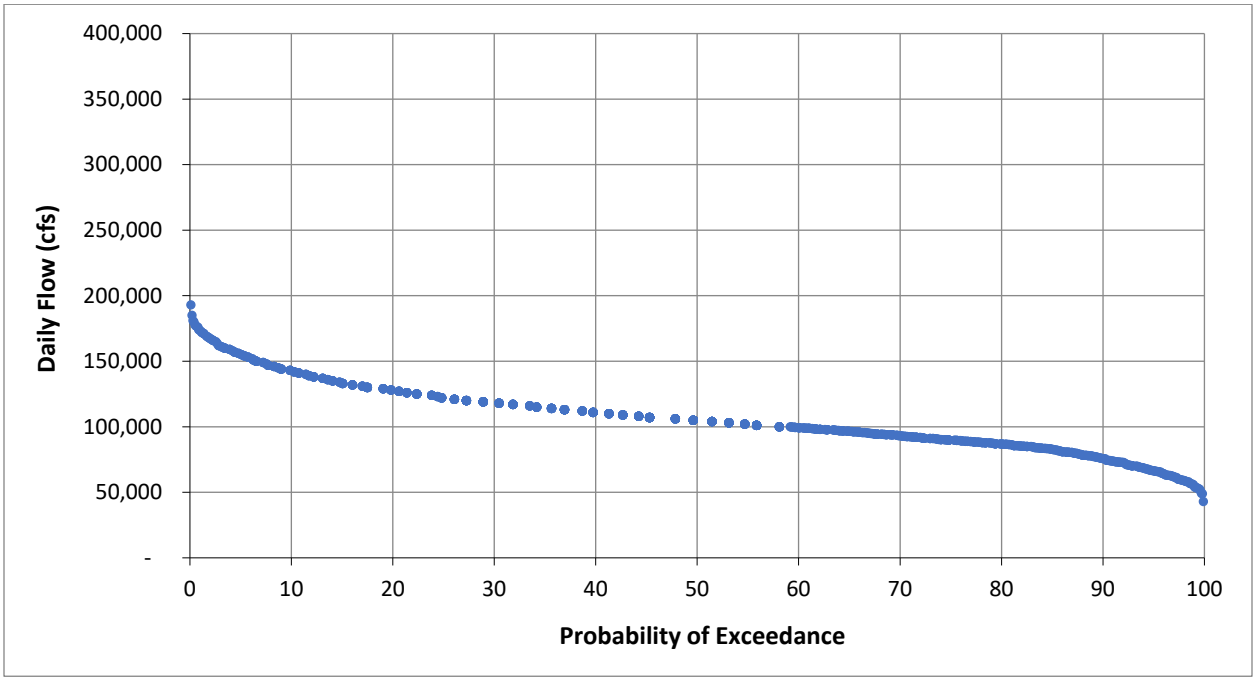

December Flow Duration Curve for Columbia River Below Rock Island Dam, WA, USGS Gage 12462600 (1988-2020)

APPENDIX G FINAL STUDY PLANS AND REPORTS WITH CONSULTATION RECORD

G.1 WATER QUALITY MONITORING STUDY PLAN AND STUDY REPORT

2022-2023 Water Quality Monitoring Study Plan

Rock Island Hydroelectric Project

FERC Project No. 943

Public Utility District No. 1 of Chelan County

327 N. Wenatchee Avenue

Wenatchee, WA 98801

June 2022

2022-2023 Water Quality Monitoring Study Plan

Rock Island Hydroelectric Project

FERC Project No. 943

Prepared for:

Public Utility District No. 1 of Chelan County
327 N. Wenatchee Avenue
Wenatchee, WA 98801

Prepared by:

Four Peaks Environmental Science & Data Solutions
338 S. Mission Street
Wenatchee, WA 98801

June 2022

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ABBREVIATIONS AND ACRONYMS

ABBREVIATION	DEFINITION
Chelan PUD	Public Utility District No. 1 of Chelan County
cm	centimeter
DART	Data Access in Real Time
DO	dissolved oxygen
Ecology	Washington Department of Ecology
FERC	Federal Energy Regulatory Commission
ILP	Integrated Licensing Process
m	meter
PAD	Pre-Application Document
Project	Rock Island Hydroelectric Project FERC Project No. 943
QAPP	Quality Assurance Project Plan
RM	river mile
Study Plan	2022-2023 Water Quality Monitoring Study Plan
TDG	total dissolved gas
TMDL	Total Maximum Daily Load
TWG	Technical Work Group
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WAC	Washington Administrative Code

1.0 INTRODUCTION

The Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Project). The Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Project, which will use the Integrated Licensing Process (ILP). Chelan PUD intends to implement this study plan and include study results in the Pre-Application Document (PAD). Decision criteria for early study plan development and implementation have been designed to match those described in FERC's guidance for applying study criteria in the ILP[1] .

[1] FERC, *A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria* (March 2012). *https://www.ferc.gov/sites/default/files/2020-07/guide-study-criteria.pdf*

2.0 STUDY GOALS AND OBJECTIVES

This 2022-2023 Water Quality Monitoring Study Plan (Study Plan) addresses the collection of water quality data that will be used to support the certification of the Project under Section 401 of the Clean Water Act by the Washington Department of Ecology (Ecology). Water quality data collected, along with existing information, may also be used to assess water quality conditions in the Columbia River within and downstream of the Project.

The specific goals and objectives of this water quality study are to:

- Supplement existing information to evaluate potential water quality effects of Project operations
- Collect water quality data to support certification of Project operations' compliance with water quality standards

This Study will address data gaps in the mainstem Columbia River within the Project boundary. Sections 3.0 and 4.0 review relevant resource goals and the geographic scope of this Study Plan, respectively. Section 5.0 provides a discussion of existing information. The water quality parameters considered in this study include dissolved oxygen (DO), pH, turbidity, suspended solids, nutrients, bacteria, and productivity at the lower trophic levels. This study will not focus on metals and toxic contaminants; existing information on these constituents will be reviewed separately. This study will also not collect continuous total dissolved gas (TDG) or temperature data because these data are already available (Section 5.0).

Data collected from this study, along with existing information, will provide the water quality characterization necessary to describe the current water quality environment, and identify potential Project effects. The synthesis of these data will form the basis for conducting additional studies in 2023 or later, if necessary, to address any remaining areas of uncertainty and inform future license conditions.

3.0 RELEVANT RESOURCE MANAGEMENT GOALS AND/OR PUBLIC INTEREST CONSIDERATIONS

The proposed data collection, along with other existing information, will be used to address the following resource management goals:

- Assess consistency of Project operations and maintenance activities with applicable water quality standards; and
- Assess consistency of Project operations with beneficial uses designated in relevant water quality standards.

Ecology has jurisdiction over the reach of the Columbia River that is within the Project boundary. The beneficial uses designated for this reach of the Columbia River in the Washington State water quality standards include salmonid spawning, rearing, and migration (aquatic life use); primary contact recreation; domestic, agricultural, industrial, and stock watering (water supply uses); and wildlife habitat, harvesting, commerce and navigation, and boating and aesthetics (miscellaneous uses; Washington Administrative Code [WAC] 173-201A-602. The applicable water quality standards are summarized in Table 3-1.

Table 3-1 Summary of Washington State Water Quality Standards in the Columbia River within the Project Boundary

PARAMETER	CRITERIA
Temperature [WAC 173-201A-200(1)(c)]	• 17.5 °C as a 7-day average of the daily maximum • The temperature criterion is not to be exceeded at a probability frequency of more than once every ten years on average, and "[t]emperature measurements should be taken to represent the dominant aquatic habitat of the monitoring site," and "typically . . . should . . . [n]ot be taken from shallow stagnant backwater areas, within isolated thermal refuges, at the surface, or at the water's edge." • A "measurable change" in temperature is defined as an "increase of 0.3 °C or greater."
Dissolved Oxygen [WAC 173-201A-200(1)(d)]	• 10 mg/L or 90% saturation as a 1-day minimum; or an intragravel DO of 8 mg/L or greater and water column DO of 9 mg/L or greater as a 1-day minimum(1) • The dissolved oxygen criteria are not to be exceeded at a probability frequency of more than once every ten years on average, and "measurements should be taken to represent the dominant aquatic habitat of the

PARAMETER	CRITERIA
	monitoring site," and "typically . . . should . . . [n]ot be taken from shallow stagnant backwater areas, within isolated thermal refuges, at the surface, or at the water's edge." • A "measurable change" in dissolved oxygen is defined as a "decrease of 0.2 mg/L or greater."
Turbidity [WAC 173-201A-200(1)(e)]	• 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
Total Dissolved Gas(2) [WAC 173-201A-200(1)(f)]	• When there is no spill TDG saturation ≤ 110% • When there is spill for anadromous juvenile fish passage the criterion is adjusted. TDG saturation shall not exceed: o an average of 115 percent as measured in the forebay of the next downstream dam (Wanapum) and must not exceed an average of 120 percent as measured in the tailrace of Rock Island Dam(3); and, o a maximum TDG saturation level of 125 percent calculated as an average of the two highest hourly TDG measures in a calendar day during spillage for fish passage. • During the spring spill season (generally from April through June), spill may be increased up to the following levels as measured at the tailrace fixed site monitoring location(4): o a maximum TDG saturation level of 125 percent on average(3); and, o a maximum TDG saturation level of 126 percent calculated as an average of any two consecutive hourly TDG measures.
pH [WAC 173-201A-200(1)(g)]	pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.
Aquatic Fine Sediment [WAC 173-201A-200(1)(h)]	No excess human-caused sources of fine sediment (< 2 mm) that impair designated uses.(5)
Bacteria [WAC 173-201A-200(2)(b)]	*E. coli* organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than 10 sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL.

PARAMETER	CRITERIA
Toxics and Aesthetics [WAC 173-201A-240] [WAC 173-201A-260 (2)] [40 CFR 131.45]	In addition to numeric criteria in WAC 173-201A-240 and 40 CFR 131.45, the following narrative criteria apply to all existing and designated uses: • Toxic, radioactive, or deleterious material concentrations must be below those which have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health (numeric criteria are set forth in WAC 173-201A-240 and 40 CFR 131.45 for toxic substances, and 173-201A-250 for radioactive substances). • Aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.

Notes:
1. Ecology adopted these criteria effective April 22, 2022; they will take effect for Clean Water Act purposes when approved by EPA.
2. The TDG criteria do not apply when the stream flow exceeds the 7-day, 10-year flood frequency (7Q10).
3. These averages are calculated as an average of the 12 highest hourly readings in a calendar day, relative to atmospheric pressure.
4. If the higher criteria are applied during spring spill season it must be done so in accordance with Endangered Species Act consultation documents associated with spill operations and requires an Ecology approved monitoring plan, and TDG must be reduced to allowances specified under WAC 173-201A-200(1)(f)(ii)(A) if the calculated incidence of gas bubble trauma in salmonids or non-salmonids exceed the thresholds under WAC 173-201A-200(1)(f)(ii)(B)(III).
5. Compliance may be demonstrated by comparing site data to reference sites or regional data that represent a least disturbed site from a comparable waterbody or ecoregion.

4.0 GEOGRAPHIC SCOPE

The Project is located on the Columbia River in Chelan County and Douglas County, Washington, from river mile (RM) 453.4 to RM 473.7.

The geographic extent of the water quality monitoring will extend from the tailrace of Rocky Reach Dam to the tailrace of Rock Island Dam on the mainstem Columbia River. Specifically, monitoring will occur in the following locations (Figure 4-1):

- Tailrace of Rocky Reach Dam
- Forebay of Rock Island Dam
- Tailrace of Rock Island Dam

Samples collected in the tailrace locations will be near the surface. Water samples will be collected from three depths in the forebay: 1 meter (m) below the surface, mid-depth of reservoir or mid-depth of the thermocline (if reservoir is stratified), and at the mid-depth of turbine intake. Existing long-term water quality data will provide the information necessary to assess water quality coming into the Columbia River within the Project boundary (Section 5.0). Therefore, water quality monitoring is not proposed for tributaries.

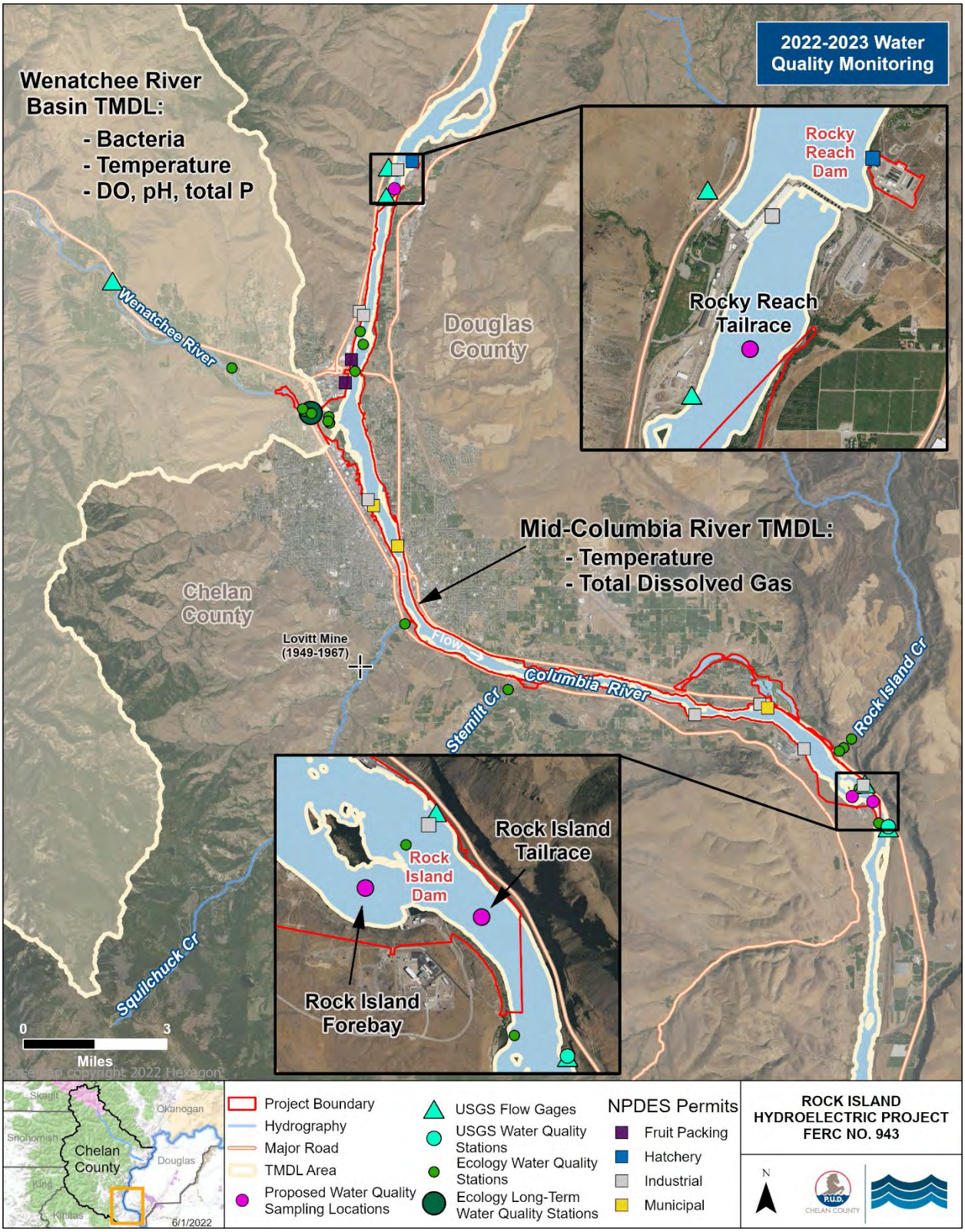

Figure 4-1 Project Boundary and Monitoring Locations

5.0 REVIEW OF EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

5.1 Sources of Existing Information

The following sources of information were reviewed to assess availability of water quality data in the Columbia River within the Project boundary and for the Columbia River tributaries that enter within the Project boundary:

- Columbia River Data Access in Real Time (DART) stations (CBR 2021);
- Columbia River temperature Total Maximum Daily Load (TMDL) (USEPA 2021)
- Columbia River TDG TMDL (Pickett et al. 2004);
- Ecology's Environmental Information Management database—long-term and historical monitoring locations within the Project boundary and the tributaries (Ecology 2021);
- U.S. Geological Survey's National Water Information System web interface (USGS 2022);
- Tributary TMDLs (Wenatchee River TMDLs – Temperature [Schneider and Anderson 2007], DO, pH [Carroll and Anderson 2009], and Bacteria [Carroll and O'Neal 2005]); and,
- Discharge Monitoring Reports associated with National Pollutant Discharge Elimination System (NPDES) permits for point sources (Ecology 2022).

The Columbia River DART stations provide high frequency data on flow, temperature, and TDG (CBR 2021). An extensive analysis of the temperature data in the Project tailrace and at the tailrace of Rocky Reach Dam has been conducted as part of the Columbia River Temperature TMDL (USEPA 2021). Ecology is in the process of developing an implementation plan for the Columbia River Temperature TMDL. Ecology's certification of Project operations with temperature standards will be addressed through the TMDL implementation process and will be incorporated into the certification. Therefore, collection of additional high frequency temperature data is not necessary. Chelan PUD also conducts continuous monitoring of temperature and TDG in the Rock Island forebay and tailrace to meet its 401 Certification conditions under the current FERC license. These data are reported annually to Ecology and FERC.

Existing data sources were reviewed for data availability. Figure 5-1 shows a summary of the data available from these sources for the mainstem Columbia River and its tributaries entering the Project boundary. A majority of these data are available from Ecology's Environmental Information Management database that includes both current and historical stations (Ecology 2021). Some of the older data are from past monitoring conducted by the U.S. Geological Survey (USGS Station 12462600 – Columbia River below Rock Island).

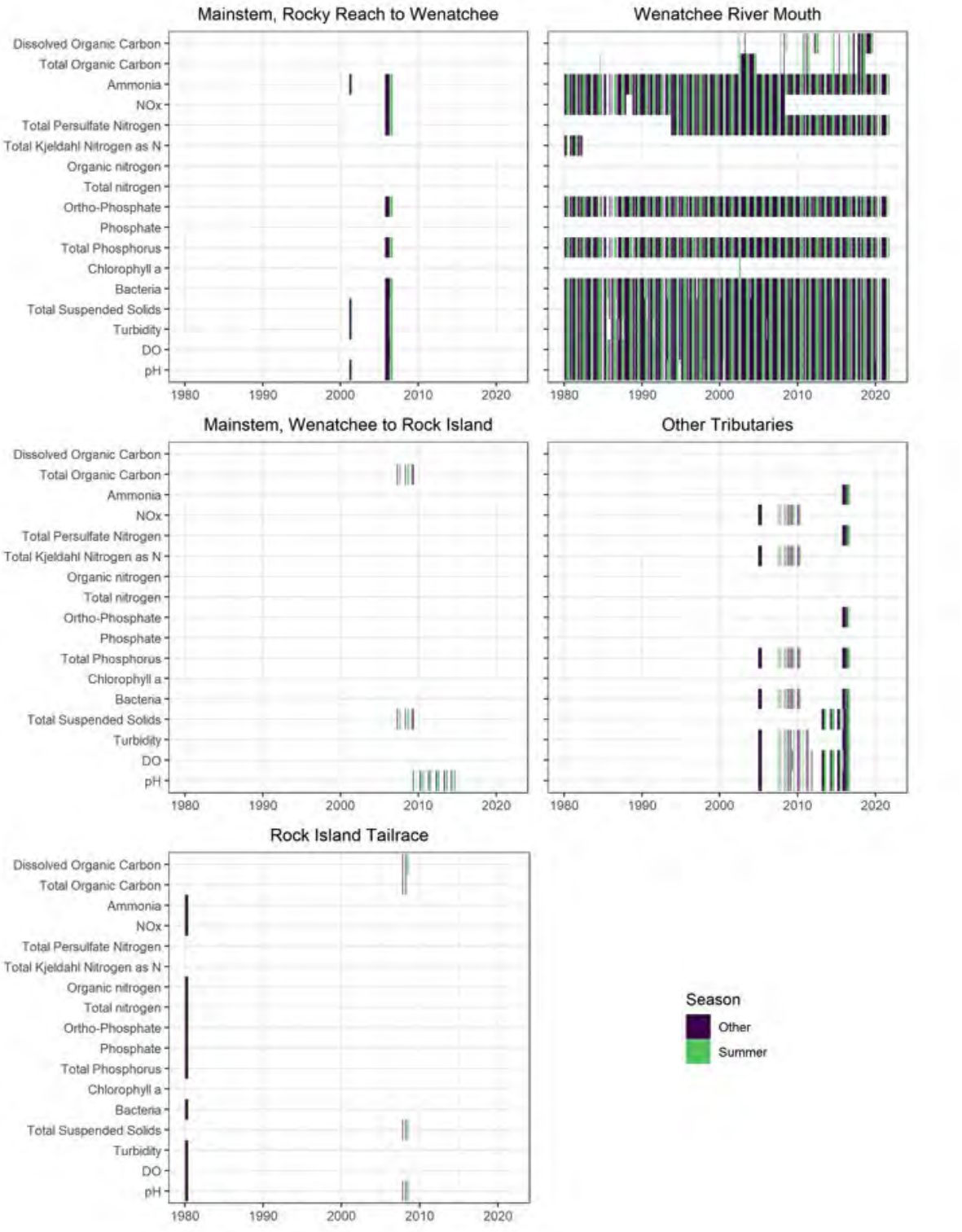

Figure 5-1 Water Quality Data Available (1980 – present) on the Mainstem Columbia River from Rocky Reach Tailrace to Rock Island Tailrace, and the Tributaries within this Reach

The Wenatchee River is a major tributary of the Columbia River that enters between Rocky Reach and Rock Island dams. Other minor tributaries within this reach of the Columbia River include Squilchuck Creek, Stemilt Creek, and Rock Island Creek. Ecology has a long-term monitoring station in the lower Wenatchee River at Wenatchee, which provides data on nutrients, suspended solids, and other water quality parameters (Figure 5-1). Along with the USGS flow gage at Monitor (USGS Gage No. 12462500) these data can be used to quantify the loads entering the Columbia River. Historical nutrient data are also available for the minor tributaries (Figure 5-1).

Point sources entering the Columbia River between Rocky Reach and Rock Island dams are summarized in Table 5-1. Effluent data for these point sources are available from the corresponding discharge permits.

Table 5-1 Point Sources Entering the Columbia River within the Project Boundary

FACILITY NAME	PERMIT NUMBER	PERMIT TYPE
Wenatchee POTW	WA0023949	Municipal
E Wenatchee STP	WA0020621	Municipal
Alcoa Wenatchee	WA0000680	Industrial
Rocky Reach Dam	WA0991033	Industrial
Stemilt Growers Euclid	WAG435172	Fruit Packer
Stemilt Growers Olds Station 2	WAG435157	Fruit Packer
Tree Top Inc Wenatchee	WA0051527	Industrial
Naumes Processing/ Keyes Fibre Corp	WA0051811	Industrial
Lineage Logistics	WA0052400	Industrial
KB Alloys/AMG Al North America	WA0002976	Industrial
Specialty Chemical	WA0002861	Industrial
City of Rock Island	WA0501487	Municipal
Rock Island Dam	WA0991032	Industrial

Notes: This information is available from Ecology's Permitting and Reporting Information System website (Ecology 2022)

5.2 Data Gaps

Existing water quality information on the mainstem Columbia River between the tailrace of Rocky Reach Dam and the tailrace of Rock Island Dam is largely limited to temperature and TDG. Information on other water quality parameters including DO, pH, turbidity, suspended solids, nutrients, and productivity is not available or is very limited in spatial and temporal extents within the Project boundary spanning the mainstem Columbia River (Figure 5-1). Long-term water quality data are available at the mouth of the Wenatchee River, the largest tributary within the Project reach. In addition, nutrient data are also available from past studies in other minor tributaries (Figure 5-1). Therefore, key data gaps for water quality are limited to the mainstem Columbia River.

6.0 PROJECT NEXUS AND RATIONALE FOR STUDY

Project operations and maintenance activities may affect ambient water quality and the designated uses identified in Section 3-13.0. The discussion below provides the rationale for the water quality parameters that are being considered in this water quality monitoring study.

6.1 Suspended Solids and Turbidity

Impoundment may result in a change in sediment transport and hence turbidity. Runoff and snowmelt may experience slower velocities in Rock Island Reservoir resulting in a change in sediment deposition patterns. Similarly, pool level fluctuations from Project operations may affect erosion and mobilization of sediments. To assess whether the Project operations could result in exceedance of turbidity criteria discussed in Section 3.0, monitoring of turbidity will be conducted during the low flow conditions in summer and fall and during the higher flow conditions; over both winter and spring as discussed in the monitoring schedule in Section 7.0. Furthermore, the suspended solids data proposed for collection will be combined with existing suspended solids data to develop a sediment budget to inform the effects of Project operations on suspended solids.

6.2 Nutrients and Lower Trophic Level Productivity

As discussed in Section 5.0, existing information on nutrients and lower trophic level productivity in the mainstem Columbia River is limited. Collecting nutrients and primary productivity data is intended to close this data gap. These data will be used to assess whether Project operations may change the nutrient levels in the Columbia River within the Project boundary. The data on chlorophyll-a, zooplankton, and periphyton will also be used to assess whether the lower trophic level productivity changes appreciably from the conditions upstream of the Project (as determined by data from the tailraces of Rocky Reach and Rock Island dams). In combination with these nutrient data, the chlorophyll-a data will also inform the trophic status within the Project boundary.

Data will be collected over both the growing and non-growing seasons[2] such that nutrient budgets can be developed under low- and high-flow conditions to assess whether Project operations may contribute to retention and assimilation of nutrients, and if so, whether such changes may have a potential to affect ambient water quality criteria.

[2] For purposes of this study plan, the growing season is defined as being from June – September, and non-growing season encompassing the rest of the year from winter through the following spring.

6.3 Dissolved Oxygen and pH

DO and pH may be affected if Project operations cause a change in the primary production and/or benthic respiration within the Project boundary. DO and pH data collection will inform whether the water quality criteria are met in the forebay and tailrace of Rock Island Dam. Data from the tailrace of Rocky Reach Dam and the mouth of the Wenatchee River may provide an indication of the DO and pH conditions in the inflows to the Project boundary. As with other parameters, DO and pH data will be collected during the growing and non-growing seasons to assess whether Project operations may alter these parameters during low- and high-flow conditions.

6.4 Bacteria

E. coli data will be collected and compared to the criteria discussed in Section 3.0 to assess whether Project operations may affect bacterial levels and hence primary contact recreation uses within the Project boundary.

7.0 STUDY METHODOLOGY

Water quality monitoring will be conducted for the parameters shown in Table 7-1 at the Rocky Reach Dam tailrace, three depths in the Rock Island Dam forebay, and Rock Island Dam tailrace (Figure 4-1). Samples will be collected at the schedule shown in Table 7-2 between July 2022 and September 2023. All sampling locations will be accessed from a boat.

Table 7-1 2022-2023 Water Quality Monitoring Study Parameters

FIELD PARAMETERS[1]	LABORATORY ANALYTES[1]	BIOLOGICAL ANALYTES[2,3]
DO, pH, Turbidity, Temperature	Total Phosphorus, Orthophosphate, Total Dissolved Phosphorus, Nitrite+Nitrate (NOx), Nitrite, Total Ammonia, Total Kjeldahl Nitrogen, Organic Nitrogen, Total Organic Carbon, Dissolved Organic Carbon, Alkalinity, Total Suspended Solids, Chlorophyll-a, E. Coli	Zooplankton, Periphyton (biomass and major taxa)

Notes:
1. These samples will be collected at all three locations; in the Rock Island Forebay, water samples will be collected at three depths.
2. Zooplankton samples will be collected as surface tows at all three locations.
3. Periphyton samples will be collected in shallower area in the tailraces of Rocky Reach and Rock Island dams.

Table 7-2 2022-2023 Monitoring Study Sampling Schedule

MONTH	PERIPHYTON AND ZOOPLANKTON	ALL OTHER PARAMETERS
Jul-2022	X	X
Aug-2022		X
Sep-2022		X
Oct-2022	X	X
Nov-2022		
Dec-2022		
Jan-2023	X	X
Feb-2023		
Mar-2023		
Apr-2023	X	X
May-2023		
Jun-2023		X
Jul-2023	X	X
Aug-2023		X
Sep-2023		X

Water quality monitoring will follow the procedures described in the Quality Assurance Project Plan (QAPP; Appendix A). A summary of the sample collection methods is provided below. The QAPP describes the details of the analytical methods, quantitation limits, field and laboratory sampling and handling procedures, field and laboratory parameter quality control criteria, reporting requirements and schedule, and points of contact for key personnel engaged in the study.

7.1 Water Quality Samples for Laboratory Analysis

Water quality samples will be collected using a Van Dorn sampler at a depth of approximately 1 m in the tailraces of Rock Island and Rocky Reach dams. Sample collection and handling will follow standardized protocols for surface water quality sampling (Ecology 2017, 2019a), and are described in greater detail in the QAPP (Appendix A). In the Rock Island Dam forebay, water samples will be collected using a Van Dorn sampler at three depths, targeting the surface (approximately 1 m below water surface), a second sample at 10 m below the water surface (approximately mid-depth between the surface and centerline of turbine intakes), and a third sample at approximately 18 m below water surface (approximately at the centerline elevation of Powerhouse 2 turbine intakes). If field measurements of temperature (Section 7.2) indicate a stratified water column in the forebay, then the field measurements will be collected to the bottom (approximately within 1-m of bottom to not disturb sediments) and the mid-depth sample will be collected within the thermocline, and the bottom sample will be collected within the hypolimnion. One set of duplicate water quality samples will be collected per event. Water quality samples will be analyzed at AmTest laboratory in Kirkland, WA, which is accredited by Ecology.

7.2 Field Water Quality Measurements

Instantaneous field measurements of DO, pH, turbidity, and temperature will be obtained using a YSI ProDSS digital water quality meter or similar instrument. Ecology protocols for collection of field measurements will be followed (Ecology 2019b). Pre- and post-event calibration checks will be performed as outlined in Section 5.1.2 of the QAPP (Appendix A). Temperature measurements will be obtained at the Rock Island Dam forebay over approximately 3 to 5 m intervals to determine whether a thermocline exists. If a thermocline is present, then the mid-depth water quality sample for laboratory analyses (Section 7.1) will be obtained within the thermocline, and the bottom sample will be collected from the hypolimnion. One set of duplicate field measurements will be collected per event.

7.3 Periphyton

Periphyton samples will be collected from shallower areas in the Rocky Reach and Rock Island Tailrace locations. Periphyton composite samples will be collected from representative rocks from the tailrace sites following Ecology's Standard Operating Procedure (Ecology 2019c). Coarse

substrate will be selected from eight random transects. An area of 44.18 cm^2 (the area of a 7.5 cm ring) will be scraped from the tops of rocks that are relatively flat and similar in size. Algae will be removed using a knife and cut into small segments or brushed using a wire brush, preserved with ethanol, and shipped to the laboratory for analysis. Periphyton will be analyzed for ash-free dry weight biomass and chlorophyll. For a subset of samples (one per growing season) major taxa will be identified. Additional details of sample collection, handling, processing, and quality control methods are described in the QAPP (Appendix A).

7.4 Zooplankton

Zooplankton samples will be collected at surface locations (approximately the top 2 m) of all three sites. Sample collection will follow U.S. Environmental Protection Agency (USEPA) protocols for collection of zooplankton (USEPA 2020). At the forebay location, samples will be collected using a tow net using vertical tows. For the tailrace locations, samples will be collected using a tow net with an attached flow meter to assess volume of sample collected, or a using a battery-powered diaphragm pump that pumps water from a fixed depth (~2 m) through a filter and into a calibrated catch bucket following the methods for zooplankton collection from large riverine systems discussed in Appel et al. (2019). All samples will be rinsed and preserved following USEPA protocols, and shipped to the laboratory (EcoAnalysts, Inc.) for identification of taxa and biomass estimation. Additional details of sample collection, handling, processing, and quality control methods are described in the QAPP (Appendix A).

8.0 SCHEDULE, PERIODIC REPORTING, AND CONSULTATION

8.1 Schedule

The study will be implemented based on the following schedule:

- Field work planning activities will commence in summer of 2022.
- Field work and associated data quality assurance/quality control activities will commence in July 2022 and continue through September 2023.
- Data analysis and initial results will be presented in the Draft 2022 Water Quality Monitoring Study Report in March 2023.
- A complete set of data, including those collected in 2023, along with interpretations will be presented in the 2022-2023 Water Quality Monitoring Study Report in Fall 2023.

8.2 Periodic Reporting and Study-Specific Consultation

A Draft 2022 Water Quality Monitoring Study Report will be prepared in March 2023 to characterize the information collected through that time and develop preliminary interpretations. The draft report will be provided to the TWG for review upon completion. A 2022-2023 Water Quality Monitoring Study Report will be prepared in September 2023 and shared with TWG members for review upon completion.

The consultation record for this plan is included in Appendix B.

9.0 LEVEL OF EFFORT AND COST

The estimated cost for conducting this water quality monitoring study and synthesizing and reporting the findings is approximately $210,000.

10.0 REFERENCES

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APPENDIX A QUALITY ASSURANCE PROJECT PLAN FOR 2022-2023 WATER QUALITY MONITORING STUDY

QUALITY ASSURANCE PROJECT PLAN

ROCK ISLAND HYDROELECTRIC PROJECT

FERC Project No. 943

Prepared for:

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

FOUR PEAKS ENVIRONMENTAL SCIENCE & DATA SOLUTIONS
338 S. MISSION STREET
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JUNE 2022

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ABBREVIATIONS AND ACRONYMS

ABBREVIATION	DEFINITION
Chelan PUD	Public Utility District No. 1 of Chelan County
DO	dissolved oxygen
Ecology	Washington Department of Ecology
FERC	Federal Energy Regulatory Commission
MQO	measurement quality objectives
MS	matrix spikes
MSD	matrix spike duplicates
Project	Rock Island Hydroelectric Project FERC Project No. 943
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RPD	relative percent difference
SOP	standard operating procedure
Study Plan	2022-2023 Water Quality Monitoring Study Plan
TWG	Technical Working Group

1.0 BACKGROUND

This Quality Assurance Project Plan (QAPP) has been prepared to support the 2022-2023 Water Quality Monitoring Study Plan (Study Plan) developed as part of the early engagement for the relicensing of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Project). The Project background and relicensing process are described in Section 1.0 of the Study Plan. This QAPP follows the guidelines provided by Washington Department of Ecology (Ecology) for preparing QAPPs for water quality studies (Ecology 2004). This QAPP describes the data quality objectives, study methods, and quality control (QC) protocols that will be followed during the implementation of the study.

2.0 MONITORING PROGRAM OBJECTIVES AND FIELD SAMPLING PLAN

2.1. Monitoring Program Objectives

As described in Section 2.0 of the Study Plan, the primary objectives of the monitoring are the following:

- To collect information necessary to supplement existing information to evaluate potential water quality effects of Project operations; and
- To provide water quality data to support certification of Project operation compliance with water quality standards.

Existing water quality information on the mainstem Columbia River between the tailrace of Rocky Reach Dam and the tailrace of Rock Island Dam is largely limited to temperature and total dissolved gas. Information on water quality parameters, such as dissolved oxygen (DO), pH, turbidity, suspended solids, nutrients, and productivity, are not available or are very limited in spatial and temporal extents within the Project boundary spanning the mainstem Columbia River. Long-term water quality data are available at the mouth of the Wenatchee River (the largest tributary within the Project reach). Therefore, data collection is proposed only in the mainstem (see Section 5.0 of the Study Plan).

To address the data gaps in the mainstem Columbia River within the Project boundary, monitoring will characterize water quality entering and leaving the Project boundary. These water quality data will support assessment of nutrients and productivity at the lower trophic levels. These data will be used to describe the existing environment, evaluate potential Project effects, and identify areas of uncertainty that would require additional focused studies. The synthesis of these data will form the basis for identifying information gaps or conducting additional studies in 2023 or later, if necessary, to address any remaining areas of uncertainty and inform a future license condition.

2.2. Field Sampling Plan

The monitoring activity includes the collection of water quality data from July 2022 to September 2023 between the tailrace of Rocky Reach Dam and the tailrace of Rock Island Dam. Figure 2-1 and Table 2-1 show the approximate locations and descriptions of the three sites where samples will be collected: 1) tailrace of Rocky Reach Dam, 2) forebay of Rock Island Dam, and 3) tailrace of Rock Island Dam. Samples will be collected for physical and chemical water quality parameters and biological measures of periphyton and zooplankton at the frequency described in Table 2-2. Details of the monitoring activities are described below.

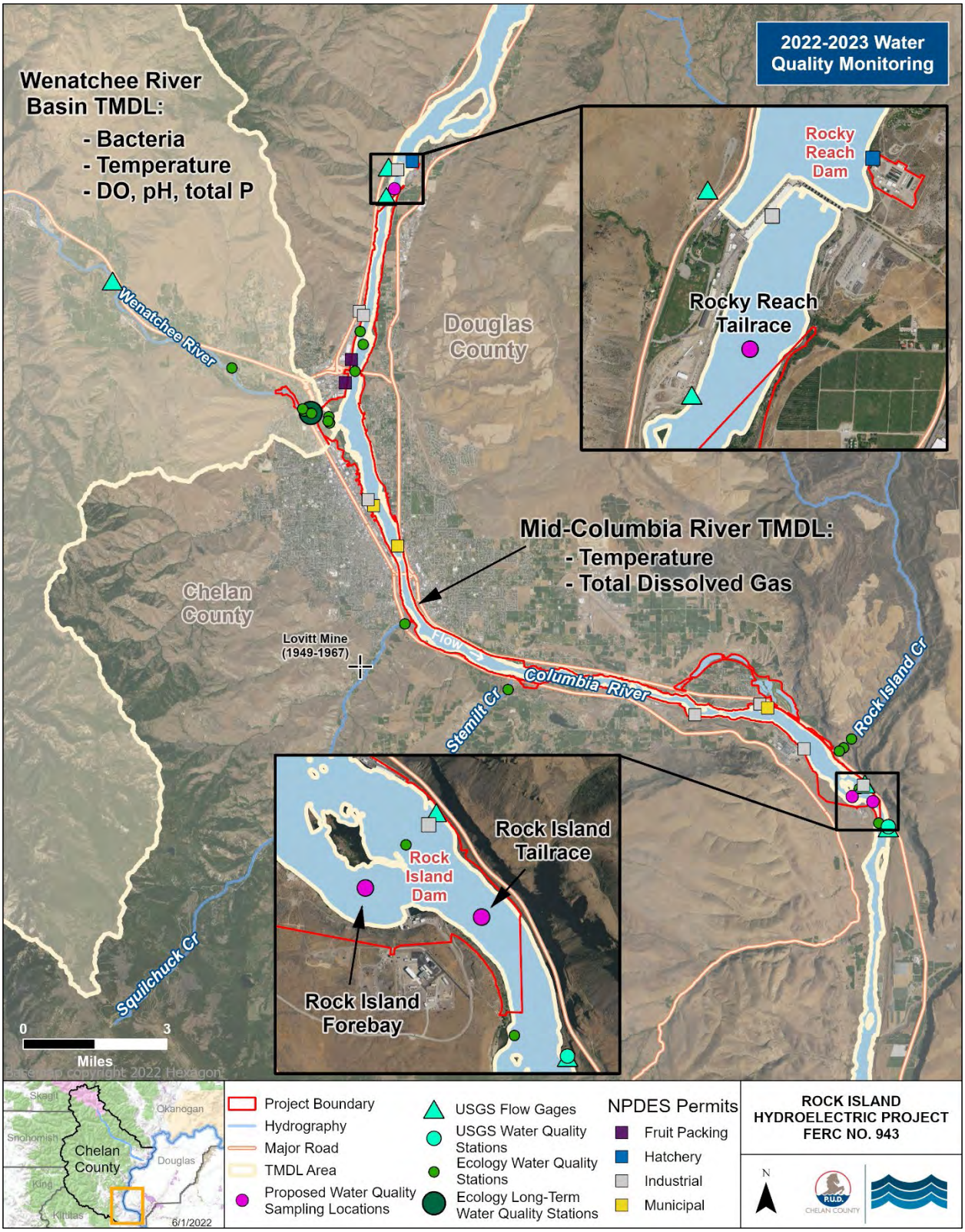

Figure 2-1 Map of Sampling Locations

Table 2-1 Monitoring Locations

LOCATION	SITE ID	LATITUDE[1]	LONGITUDE[1]	TARGET DEPTHS
Tailrace of Rocky Reach Dam	RR TR	47.526222	-120.298564	~1 m
Forebay of Rock Island Dam	RI FB	47.341577	-120.097167	3 Depths: 1) ~1 m; 2) Mid-depth of water column or thermocline (if stratified); 3) Mid-depth of turbine intake
Rock Island Dam Tailrace	RI TR	47.33993	-120.087928	~1 m

[1]These coordinates are intended to provide target locations for sampling; the actual sampling locations might be adjusted based on accessibility, safety, and site conditions; the coordinates of actual sampling locations will be noted during the first event and subsequent events will be conducted in that same vicinity.

Table 2-2 Sampling Frequency 2022-2023

YEAR	MONTH	PHYSICAL & CHEMICAL WATER QUALITY	PERIPHYTON AND ZOOPLANKTON
2022	July	X	X
	August	X	
	September	X	
	October	X	X
	November		
	December		
2023	January	X	X
	February		
	March		
	April	X	X
	May		
	June	X	
	July	X	X
	August	X	
	September	X	

2.2.1. Water Quality Surveys

Monthly water quality surveys will be conducted at the frequency described in Table 2-2 at the three locations shown in Figure 2-1 and as described in Table 2-1. Sample water will be collected for analytical measurements of total phosphorus (TP), orthophosphate (OP), total dissolved phosphorus (TDP), nitrite + nitrate (NOx), nitrite, total ammonia, total Kjeldahl nitrogen (TKN), organic nitrogen (ON), total organic carbon (TOC), dissolved organic carbon (DOC), chlorophyll a

(Chl-a), alkalinity (Alk), total suspended solids (TSS), and *Escherichia coli (E. coli)*. In addition, in-situ measurements using a water quality meter will measure temperature, DO, pH, and turbidity at each sampling location and depth. The Rocky Reach Dam tailrace and Rock Island Dam tailrace sampling will target approximately 1m depth. The Rock Island forebay site will have collection and measurements at 3 depths: 1) 1 meter, 2) mid-depth of the water column, and 3) at approximately the mid-depth of the turbine intake.

All water quality surveys will follow standardized protocols for surface water quality sampling (Ecology 2017, 2019a,b). One field duplicate sample will be collected for each event, with the location cycling through the sampling locations over the events. In total, five site samples and one duplicate will be collected for laboratory analysis during each event.

2.2.2. Periphyton and Zooplankton Surveys

Samples to assess periphyton and zooplankton biodiversity will also be collected at the proposed sampling sites (Figure 2-1 and Table 2-1). Periphyton will be assessed from rock scrapings at shoreline areas to the Rocky Reach Dam tailrace and Rock Island Dam tailrace locations. Zooplankton samples will be collected at surface locations (top 2 m) of all three sites.

2.3. Practical Constraints on Study Design

The study design could have potential field constraints. Some sites may have access limitations during high flow and spill conditions. In particular, operating a boat at a uniform speed to conduct uniform zooplankton tows and performing safe grab samples may be challenging during high flows. The timing of field events must be carefully coordinated with weather/hydrologic conditions and Project operations to ensure accessibility and safety. In addition, including reserve days for repeating sampling events and maintaining redundant equipment (for example, sampling bottles) will minimize data loss. Finally, the ongoing COVID-19 pandemic poses a challenge for any field operation. To the extent feasible, back-up personnel/crew may be kept on standby in the event one or more of the field crew is affected by the pandemic. Any problems that interfere with field sampling and data quality will be noted and discussed in the report.

3.0 PROJECT MANAGEMENT, ORGANIZATION, AND SCHEDULE

3.1. Project Organization and Management

Project team organization and the roles and responsibilities of each individual are listed in Table 3-1.

Table 3-1 Project Staff Organization

STAFF AND CONTACT INFORMATION	TITLE	RESPONSIBILITY
Breean Zimmerman 509-575-2808 breean.zimmerman@ecy.wa.gov Washington Department of Ecology, Central Regional Office	Hydropower Projects Manager	Ensures review and approval of the draft and final QAPP.
Marcie Clement marcie.clement@chelanpud.org 509-760-9402 Public Utility District No. 1 of Chelan County (Chelan PUD)	Program Manager – Water Resources	Oversees Project 401 Certification and ultimately accountable for compliance with the terms of the 401 Certification; provides site coordination with field personnel and Chelan PUD field and operations staff to ensure site access for collection of samples; and reviews and approves the QAPP.
Pradeep Mugunthan 773-505-4450 pmugunthan@fourpeaksenv.com Four Peaks Environmental Science & Data Solutions	Water Quality Lead and Principal Investigator	Responsible for overall water quality monitoring program for the project; designs the program and responsible for all planning and reporting documents prepared for this study; coordinates with the rest of the project team to ensure adherence to the QAPP; oversees the interpretation and final reporting of water quality data.
Leah Nagel 509-415-3480 x718 mweiland@fourpeaksenv.com Four Peaks Environmental Science & Data Solutions	Field Lead	Provides oversight for field sampling activities; executes and coordinates field work between the Chelan PUD operations and the field crew; coordinates sample collection and analysis; ensures timely delivery of samples to laboratories; responsible for field sampling logistics; ensures that field activities adhere to the QAPP.

STAFF AND CONTACT INFORMATION	TITLE	RESPONSIBILITY
George Dang 610-573-3245 gdang@fourpeaksenv.com Four Peaks Environmental Science & Data Solutions	Data Quality Manager	Provides quality assurance oversight for field and laboratory data; coordinates with the laboratory manager to ensure data quality and takes any corrective actions; brings quality assurance and QC issues to the principal investigator in a timely manner so that appropriate corrective actions can be taken; reviews laboratory data to ensure appropriate qualifiers are used; prepares a final data validation report
Aaron Young 425-885-1664 aarony@amtestlab.com AmTest, Inc.	Water Quality Laboratory Project Manager	Serves as the point of contact for all water quality laboratory analyses; reviews and approves the QAPP; responsible for ensuring laboratory procedures adhere to the QAPP; oversees/prepares final electronic data report and data deliverable for each sampling event
Megan Payne 208-882-2588 mpayne@ecoanalysts.com EcoAnalysts, Inc.	Biological Laboratory Project Manager	Serves as the point of contact for all biodiversity analyses (periphyton and zooplankton); reviews and approves the QAPP; responsible for ensuring laboratory procedures adhere to the QAPP; oversees/prepares final electronic data report and data deliverable for each sampling event

3.2. Project Schedule

3.2.1. Monitoring Schedule

Monthly sampling for physical and chemical water quality and biological surveys for periphyton and zooplankton will occur between July 2022 and September 2023 at the frequency summarized in Table 2-2.

3.2.2. Reporting Schedule

Following the completion of the 2022 sampling events, a 2022 Water Quality Monitoring Study Report will be prepared for the Technical Work Group (TWG) by March 2023. This report will summarize 2022 survey activity—noting any deviations from the monitoring QAPP—preliminary interpretations, data validation reports, and laboratory reports.

A draft 2022-2023 Water Quality Monitoring Study Report with the addition of the data collected in 2023 will be prepared for TWG review by September 2023. The final report will be prepared within 30 days of receipt of TWG comments and will include the consultation record, including any comments from the TWG and responses as an appendix. Note that the final sampling event will be conducted in September 2023 (Table 2-2) and the draft report may not include data from this event. The final report will include all remaining data when it is received and validated.

4.0 DATA QUALITY OBJECTIVES

4.1. Measurement Quality Objectives

The measurement quality objectives (MQO) determine how good the data must be to meet the data collection objectives discussed in Section 2.1. An MQO is established through accuracy (precision and bias) and the sensitivity of the analytical methods and field measurement instruments.

4.1.1. Water Quality

4.1.1.1. Laboratory Samples

Laboratory analysis will be conducted for the nutrients, organic carbon, chlorophyll-a, and total suspended solids parameters are summarized in Table 4-1. The analytical methods and quantitation levels are also shown in Table 4-1.

Table 4-1 Analytical Methods and Quantitation Limits for Laboratory Analytes

PARAMETER	METHOD	QUANTITATION LEVEL
Total Phosphorous	SM 4500-PF	1 microgram per liter
Orthophosphate	SM 4500-PE	1 microgram per liter
Total Dissolved Phosphorous	SM 4500-PF	1 microgram per liter
Nitrite + Nitrate	EPA 353.2	20 micrograms per liter
Nitrite	SM 4500-NO2B	3 micrograms per liter
Total Ammonia	EPA 350.1	20 micrograms per liter
Total Kjeldahl Nitrogen	EPA 351.2	250 micrograms per liter
Organic Nitrogen	SM 4500-N	100 micrograms per liter
Chlorophyll a	APHA 10200 H	1 microgram per liter
Total Organic Carbon	SM 5310B	200 micrograms per liter
Dissolved Organic Carbon	SM 5310B	500 micrograms per liter
Alkalinity	SM 2320B	1 milligram per liter
Total Suspended Solids	SM 2540D	1 milligram per liter
E. coli	SM 9222D	1 CFU/100mL

Accuracy will be determined in the laboratory by control samples, method blanks, matrix spikes (MS), matrix spike duplicates (MSD), and field duplicates. To maintain calibration and assess accuracy of the analytical equipment, laboratory control samples will be used. Method blanks will be used to assess contamination in the laboratory. MS and MSD provide an indication of the extraction efficiency and precision of the analytical method, respectively. The frequency at which duplicate measurements or laboratory control procedures will be performed is discussed in Section 5.2.

Bias will be expressed as the percent recovery of the measured value relative to the true or expected value. Deviation outside the expected range of percent recovery will indicate bias. Precision will be determined through the relative percent difference (RPD) between the replicates (field or laboratory). The percent recovery and RPD limits for this monitoring program (Table 4-2) were derived based on past surveys and examples provided in Ecology's QAPP guidance document (Ecology 2004).

Completeness will be assessed as the proportion of valid analytical measurements relative to the total number of measurements. The MQO for all components of this monitoring program is 90%. Data qualified as estimated during validation will be considered as valid for the purpose of evaluating completeness. Only data qualified as rejected during data validation will be excluded when evaluating completeness.

Table 4-2 Measurement Quality Objectives for Laboratory Samples

PARAMETER	LABORATORY CONTROL SAMPLE STANDARD	LABORATORY CONTROL SAMPLE DUPLICATES	MATRIX SPIKES	MATRIX SPIKE DUPLICATES	FIELD DUPLICATES
	% RECOVERY LIMITS	RPD	% RECOVERY LIMITS	RPD	RPD
Total Phosphorous	80-120	<= 20	75-125	NA	<= 20
Orthophosphate	80-120	<= 20	75-125	NA	<= 20
Total Dissolved Phosphorous	80-120	<= 20	75-125	NA	<= 20
Nitrite + Nitrate	80-120	<= 20	75-125	NA	<= 20
Nitrite	80-120	<= 20	75-125	<=20	<= 20
Total Ammonia	80-120	<= 20	75-125	NA	<= 20
Total Kjeldahl Nitrogen	80-120	<= 20	75-125	NA	<= 20
Organic Nitrogen	80-120	<= 20	75-125	NA	<= 20
Chlorophyll a	80-120	<= 20	NA	NA	<= 20
Total Organic Carbon	80-120	<= 20	75-125	NA	<= 20
Dissolved Organic Carbon	80-120	<= 20	75-125	NA	<=20
Alkalinity	80-120	<=20	NA	NA	<=25
Total Suspended Solids	80-120	<=20	NA	NA	<=25
E. coli	NA	<=20	NA	NA	<=25

4.1.1.2. Field Measurements

Instantaneous temperature, DO, pH, and turbidity measurements will be measured using a YSI ProDSS digital water quality meter or similar instrument. The minimum specifications for these parameters are listed in Table 4-3. The MQO are listed in Table 4-4. The instrument will be calibrated at the start of each sampling event. Post-event calibration checks will test instrument for drift using standards or known values. Data will be qualified according to the acceptance ranges listed in Table 4-4. Precision will be determined through the RPD between the field replicates. Completeness will be assessed as the proportion of valid measurements relative to the total number of measurements.

Table 4-3 Instrument Specifications

INSTRUMENT	PARAMETER	UNITS	RANGE	ACCURACY	RESOLUTION
Multi-Parameter Water Quality Meter	Temperature	Degrees Celsius (°C)	-5 to 40	±0.2	0.1
	DO	Milligrams per liter (mg/L)	0 to 20	±0.1 mg/L or 1% of reading, whichever is greater	0.1
	pH	Standard units	0 to 14	±0.2	0.01
	Turbidity	Nephelometric Turbidity Unit	0 to 2,000	0 to 999 NTU (0.3 or ±2% of reading, whichever is greater); > 1,000 NTU(±5% of reading)	0.1

Table 4-4 Measurement Quality Objectives for Instantaneous Field Measurements

PARAMETER	UNITS	METHOD	BIAS			PRECISION (RPD)	COMPLETENESS (%)
			ACCEPT	QUALIFY	REJECT		
Temperature	Degrees Celsius (°C)	SN2550	± 0.2	± (0.2 - 0.4)	> 0.4 or <-0.4	10	90
DO	Milligrams per liter (mg/L)	ASTM D888C	± 0.2	± (0.2 - 0.4)	> 0.4 or <-0.4	10	90
pH	Standard Units	SM4500 H	± 0.2	± (0.2 - 0.4)	> 0.4 or <-0.4	10	90
Turbidity	Nephelometric Turbidity Unit	ASTM D7725	± 4.0	± (4.0 - 8.0)	> 8.0 or <-8.0	10	90

4.1.1.3. Periphyton and Zooplankton Measurements

The quality of periphyton and zooplankton data is ensured by adhering to established sampling methodologies and experimental design, so that sampling precision is maximized, and bias is minimized. This includes collecting representative and complete sample sets using an approach and protocol that supports comparisons within the study and to studies conducted elsewhere in the region.

5.0 SAMPLING, ANALYSIS, AND QUALITY CONTROL PROCEDURES

5.1. Sampling and Analysis

5.1.1. Laboratory Samples

Collection of laboratory samples for chemical and physical parameters will follow Ecology's stream sampling and surface water sampling standard operating procedures (SOPs) (Ecology 2017, 2019a). Lotic samples will be collected from a representative section of the river. Lentic samples will be collected at various depths (Section 2.2.1). A Van Dorn or Kemmerer depth sampler will be lowered to the appropriate depth before the messenger is released to close the sampler. The sampler will then be raised to the surface for transfer to sampling bottles.

Samples will be stored in a cooler with ice or dry ice and delivered to the laboratory within 24 hours of collection to meet hold time requirements for total dissolved phosphorus, Chlorophyll-a, and E. coli. Bottle requirements, preservation, and hold times for field samples are shown in Table 5-1.

Periphyton composite samples will be collected from representative rocks along the shore of the tailrace sites following Ecology's SOP (Ecology 2019c). Rocks will be collected from areas that are always inundated during various flow stages. Coarse substrate will be selected from eight random transects. An area of 44.18 cm^2 (equivalent to a 7.5 cm diameter circle) will be scraped from the tops of rocks that are relatively flat and similar in size. Filamentous algae will be removed using a knife and cut into small segments. The remaining algae will be brushed using a wire brush. Rinsate composed of filtered stream water will be used to rinse brushed rocks and scraping equipment into the sampling containers, and the sample will be preserved with Lugol's iodine solution.

Periphyton samples will be analyzed for ash-free dry weight biomass and chlorophyll a. For one sampling event per growing season[3], periphyton samples will be identified and counted for soft-body algae and diatoms to the lowest practical taxonomic level with a subsample until at least 300 natural units are counted for soft body algae and 600 natural units for diatoms. A unit is defined as discrete cell, filament, or colony. Densities and biovolumes will be estimated and ash-free dry mass will be measured.

Zooplankton samples will be collected at surface locations (approximately the top 2 m) of all three sites. Sample collection will follow U.S. Environmental Protection Agency protocols for collection of zooplankton (USEPA 2020). At the forebay location, samples will be collected using a tow net

[3] Either July or October 2022 and July of 2023

using vertical tows. For the tailrace locations, samples will be collected using a tow net with an attached flow meter to assess volume of sample collected, or a using a battery-powered diaphragm pump that pumps water from a fixed depth (~2 m) through a filter and into a calibrated catch bucket following the methods for zooplankton collection from large riverine systems discussed in Appel et al. (2019). All samples will be rinsed with soda water and preserved with an approximately 70% ethanol solution (diluted with sample water). Samples will be stored in coolers filled with ice and shipped to the laboratory (EcoAnalysts, Inc.) for identification of taxa and biomass estimation. Zooplankton will be identified and counted to the lowest practical taxonomic level using a subsample of 200-400 coarse and fine individuals.

Biological field sampling will follow standard equipment decontamination protocols (WDNR 2020).

Table 5-1 Container, Preservation, and Hold Time Requirements for Analytical Samples

PARAMETER	CONTAINER	PRESERVATION	HOLDING TIME
Total Phosphorous	250 mL poly	Acidify with sulfuric acid to pH less than 2 and cool to less than 4°C during transport.	28 days
Orthophosphate	500 mL poly	Cool to less than 4°C during transport.	48 hours
Total Dissolved Phosphorous	500 mL poly	Cool to less than 4°C during transport.	Filter within 24 hours; Analyze within 28 days
Nitrite + Nitrate	250 mL poly	Acidify with sulfuric acid to pH less than 2 and cool to less than 4°C.	28 days
Nitrite	500 mL poly	Cool to less than 4°C.	48 hours
Total Ammonia	250 mL poly	Acidify with sulfuric acid to pH less than 2 and cool to less than 4°C.	28 days
Total Kjeldahl Nitrogen	250 mL poly	Acidify with sulfuric acid to pH less than 2 and cool to less than 4°C.	28 days
Organic Nitrogen	250 mL poly	Acidify with sulfuric acid to pH less than 2 and cool to less than 4°C.	28 days
Chlorophyll a	1L opaque poly	Protect from sunlight. Cool to less than 4°C until filtration. Freeze filters until analysis.	Filter within 24 hours; Analyze within 28 days
Total Organic Carbon	40 mL glass vial	Acidify with hydrochloric acid to pH less than 2, protect from sunlight, and cool to less than 4°C.	28 days
Dissolved Organic Carbon	40 mL glass vial	Protect from sunlight and cool to less than 4°C.	28 days
Alkalinity	250 mL poly	Cool to less than 6°C.	14 days

PARAMETER	CONTAINER	PRESERVATION	HOLDING TIME
Total Suspended Solids	500 mL poly	Cool to less than 4°C.	7 days
E. coli	225 mL sterile bottle	Preserve with ethylenediamine tetraacetic acid (EDTA)/sodium thiosulfate, and cool to less than 6°C.	24 hours
Periphyton	500 mL amber HPDE	Preserve with 10mL Lugol's iodine and keep out of direct sunlight.	6 Months
Zooplankton	1 L poly	Preserve with 190 proof ethanol diluted to at least 70% of the sample volume.	6 Months

Note:
Samples with similar handling and preservation may be stored and shipped within the same container.

5.1.2. Field Measurements

Measurement of in-situ parameters will follow Ecology's SOPs for measurements using a multi-parameter probe (Ecology 2016 and 2019b). The probe will be lowered to approximately the same locations and depths as where laboratory water quality samples will be sampled.

Prior to each sampling event the probe will be calibrated. DO will use the air saturated water method (Ecology 2016). pH will be calibrated to pH standard buffer solutions (pH of 4, 7, and 10). Temperature will be checked against a certified reference thermometer traceable to a NIST certified standard. Calibration checks will be conducted at the end of each sampling event to assess instrument drift using the same methods and standards as calibration.

If a deviation from calibration standards at the end of a sampling event falls within the qualifying range of the MQO (Table 4-4), then all samples measured during the event for that parameter will be qualified as estimated. Deviation beyond the qualifying range will result in the rejection of measured data for that parameter during the sampling event. A calibration log will be maintained to record all the pre- and post-event calibration data.

5.2. Quality Control

5.2.1. Water Quality

5.2.1.1. Samples for Laboratory Samples

Collection of water quality samples will adhere to this QAPP and Ecology's SOPs for water quality sampling (Ecology 2017 and 2019a). Laboratory samples will be processed and analyzed by an Ecology-accredited environmental laboratory. All physical and chemical water quality parameters

and *E. coli* will be processed and analyzed by AmTest in Kirkland, WA[4]. AmTest has a quality assurance (QA) plan that adheres to standard protocols for testing accuracy, precision, and completeness (AmTest 2021).

Analytical samples will include collection of field duplicates as outlined in Table 5-2. Field contamination is not anticipated because extensive field processing and/or sample handling is not required. Therefore, field blanks will not be collected. Laboratory QC will include analysis of MS, MSD, method blanks, and laboratory control samples and will be collected at the frequencies indicated in Table 5-2. Sufficient sample volumes will be collected at each location to support analysis of MS and MSD. Laboratory deliverables will include QA/QC measures and results and note any problems encountered during analysis.

Periphyton and zooplankton analysis will be performed by EcoAnalysts in Moscow, ID. A field duplicate will be collected for each event. Laboratory QC will consist of replicate taxonomic evaluation by another staff member for a minimum of 10% of total of taxonomic samples by event. Targeted percent similarity between staff evaluation will be ≥ 90%.

Table 5-2 Quality Control Samples, Types, and Frequency

PARAMETER	LABORATORY CONTROL SAMPLE STANDARD	LABORATORY CONTROL SAMPLE DUPLICATES	MATRIX SPIKES	MATRIX SPIKE DUPLICATES	METHOD BLANK	FIELD DUPLICATES
Total Phosphorous	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Orthophosphate	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Total Dissolved Phosphorous	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Nitrite + Nitrate	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Nitrite	1/batch	N/A	1/batch	1/batch	1/batch	1/event
Total Ammonia	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Total Kjeldahl Nitrogen	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Organic Nitrogen	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Chlorophyll a	1/batch	1/batch	N/A	N/A	1/batch	1/event
Total Organic Carbon	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Dissolved Organic Carbon	1/batch	1/batch	1/batch	N/A	1/batch	1/event
Alkalinity	1/batch	1/batch	N/A	N/A	1/batch	1/event
Total Suspended Solids	1/batch	1/batch	N/A	N/A	1/batch	1/event

[4] AmTest laboratory ID is C554 and the Ecology accreditation certificate is at: http://amtestlab.com/aboutus/Accreditation%20Cert.pdf

PARAMETER	LABORATORY CONTROL SAMPLE STANDARD	LABORATORY CONTROL SAMPLE DUPLICATES	MATRIX SPIKES	MATRIX SPIKE DUPLICATES	METHOD BLANK	FIELD DUPLICATES
E. coli	1/batch	1/batch	N/A	N/A	1/batch	1/event
Periphyton AFDM & Chlorophyll a	N/A	N/A	N/A	N/A	N/A	1/event
Periphyton Taxa	N/A	1/10% of samples	N/A	N/A	N/A	1/event
Zooplankton	N/A	1/10% of samples	N/A	N/A	N/A	1/event

5.2.1.2. Field Measurements

Several QC steps will occur during field data collection. Field QC will include adherence to this QAPP and will follow manufacturer recommendations and Ecology's SOPs for operation of multi-parameter probes (Ecology 2016 and 2019b). Multi-parameter probes will be kept in calibration as outlined in Section 5.2.1.1

5.3. Corrective Actions

Laboratory analyses that do not meet QC criteria will follow SOPs outlined for the corresponding analytical method to determine whether a reanalysis is necessary. The laboratory manager will be responsible for determining reanalysis of laboratory samples. All QC data will be reported to meet the requirements in Section 6.2.

If the multi-parameter probe post-event calibration check does not meet qualified MQO outlined in Table 4-4, the field technician will record the post-event calibration check data and report to the field lead and/or the data quality manager for further guidance. Based on pre- and post-calibration checks, a correction factor may be developed to correct for instrument bias, if necessary. Any corrected data will be noted and flagged.

The principal investigator will ultimately be responsible for reviewing field and laboratory reports to assess whether field and laboratory data meet the MQO and QC criteria (Table 4-1, Table 4-2, and Table 4-4). In the event of any deviation from the QAPP, the principal investigator will decide whether additional sampling will be necessary or whether data qualified with appropriate flags are useable to meet the study objectives in Section 2.1. If additional sampling events are necessary, the principal investigator will consult with the client to plan out an additional event, which will adhere to this QAPP.

6.0 DATA MANAGEMENT, VERIFICATION, AND VALIDATION

6.1. Data Recording

6.1.1. Laboratory Data

Analytical laboratory results will be provided as electronic data deliverables and a narrative data report. The narrative data report will identify any issues pertinent to QC, transportation, storage, and analytical methods and include a discussion on how these issues were resolved. The laboratory report will also include the chain of custody record.

Sample results will include any applicable information to each analysis such as: a sample identifier for tracking the sample in the laboratory along with the corresponding field sample identifier provided to the laboratory; date and time of analysis; weight/volume of sample used for analysis; dilution volumes and/or concentration factor; analytical method; method quantitation limit; detection limit; reporting unit; data qualifiers including definitions of qualifiers; issues with taxonomical identification; remarks specific to the sample; and how these issues were resolved. In addition to the regular results, the laboratory report will also include a QA/QC summary providing the same information as above for applicable MS, MSD, method blanks, control samples, and duplicates. In addition, percent recoveries for MS and laboratory control samples and RPD for analytical duplicates will be reported in the electronic data report.

Sample results will be included as tables with the electronic data report (either in Microsoft Word or Adobe Portable Document Format). In addition, analytical results will also be provided as a Microsoft Excel or a delimited text file (e.g., comma separated values).

6.1.2. Field Data

The field data form in Attachment 1 will be used to record field conditions and instantaneous water quality data. Any deviations from this QAPP will be noted in the field forms. Field data forms will be stored electronically as spreadsheet tables or in a relational database for the project.

6.2. Audits and Reports

Field and laboratory audits may be conducted if significant deviations in quality are discovered. The data quality manager will determine any deficiency in field or laboratory performance. In the event any QC issues or deviations from the QAPP are discovered in the field or laboratory data, the data quality manager will inform the water quality lead of the issue, who will in turn determine appropriate corrective actions as discussed in Section 5.3. The field technician will implement any corrective actions for field measurements. The laboratory manager will implement any corrective actions for any deviations from the QAPP in laboratory analyses.

The Water Quality Monitoring Study reports to be prepared at the end of the 2022 and 2023 field seasons will include a section or an appendix that provides a QA/QC summary noting any specific issues and deviations from this QAPP and the corrective actions, if any, that were taken.

6.3. Data Verification

Field data will be examined by the data quality manager for any errors or omissions and compliance with the QAPP after each sampling event. Laboratory data deliverables and reports will be reviewed by the data quality manager upon receipt to identify any potential issues with analytical methods used. The verification will evaluate the completeness of the data and conformance of the operating procedures (field parameters) or the analytical methods (for laboratory analytes) required under this QAPP.

6.4. Data Validation

The data quality manager will conduct a detailed validation to assess whether:

- Data quality objectives for precision, bias, and sensitivity were met for field and laboratory samples through:
    - Laboratory QA summaries for blanks, MS, MSD, and/or laboratory duplicates; and
    - Pre- and post-calibration logs and field duplicate measurements for field parameters.
- Hold times were met for laboratory samples;
- Reporting limits for laboratory samples met the QAPP requirements; and
- Appropriate qualifiers were used for the laboratory data and if any additional qualifiers are necessary; assign qualifiers for field data if necessary.

A data validation report will be included as an appendix to the Water Quality Monitoring Study Report.

6.5. Data Usability Assessment

The verified and validated data will be assessed for completeness of field measurements and analytical results based on the targets established in Section 4.1. If sufficient data are not available to meet the MQO at the end of each sampling event, the principal investigator may consult with the Chelan PUD project manager and decide whether additional data collection is necessary and feasible. In the event the data usability assessment determines that verified and validated data do not meet the completeness requirements after the field season is complete, the annual report will document any potential limitations in meeting the study objectives and propose follow-up actions to collect those data in subsequent field seasons, if necessary.

7.0 REFERENCES

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ATTACHMENT 1 SAMPLE WATER QUALITY CHAIN OF CUSTODY FORM AND FIELD FORM

AmTest Chain of Custody Record

13600 NE 126th PL, Suite C, Kirkland, WA 98034
Ph (425) 885-1664 Fx (425) 820-0245
www.amtestlab.com

Chain of Custody No._____

Client Name & Address:	Invoice To:
Contact Person:	Invoice Contact:
Phone No:	PO Number:
Fax No:	Invoice Ph/Fax:
E-mail:	Invoice E-mail:
Report Delivery: (Choose all that apply) Mail / Fax / Email / Posted Online	Data posted to online account: YES / NO Web Login ID:
Special Instructions:	
Requested TAT: **(Rush must be pre-approved by lab)** Standard RUSH (5 Day / 3 Day / 48 HR / 24 HR)	Temperature upon Receipt:

Project Name:		Date Sampled	Time Sampled	Matrix	No. of containers	Analysis Requested									
Project Number:															
AmTest ID	Client ID (35 characters max)														QA/QC

Collected/Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time

COMMENTS:

Field Form for Water Quality Monitoring

Project: _____

Sampled by:

Site	Sampling Location	Sample ID	Depth (m)	Date	Time	Parameter	Field Measurement		Bottle Type (Lab Samples)	Sample Type	Site Conditions/Comments
							Unit	Value			

General comments: _____

Completed by: _____

APPENDIX B CONSULTATION RECORD

Chelan PUD submitted the draft Water Quality Monitoring 2022-2023 Study Plan to the Fish and Aquatic Technical Working Group (TWG) (see Table B-1) via email on June 24, 2022 for a 10-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table B-2 below.

Table B-1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
American Rivers	Moran, Bridget
Audubon Society	Johnston, Mark
Bureau of Indian Affairs	Hatch, Keith
Cascade Fisheries	Lundgren, Jason
Chelan County	Sanderson, Julie
City of Rock Island	Laughlin, Brock
Columbia River Inter-Tribal Commission	Parker, Blaine
Columbia River Inter-Tribal Commission	Porter, Lauri
Columbia River Inter-Tribal Commission	Barton, Diane
Columbia River Inter-Tribal Commission	Carter, Julie
Columbia River Inter-Tribal Commission	Skiles, Tom
Confederated Tribes and Bands of Yakama Nation	Blodgett, David
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom
Confederated Tribes and Bands of Yakama Nation	Miller, Donella
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon
Confederated Tribes of the Colville Reservation	Truscott, Kirk
Confederated Tribes of the Colville Reservation	Baldwin, Casey
Confederated Tribes of the Colville Reservation	Marconi, Douglas
Confederated Tribes of the Colville Reservation	McLellan, Jason
Confederated Tribes of the Colville Reservation	Nine, Bret
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron
Confluence Environmental Company	Doyle, Eric
Golder WSP	Grutter, Paul
Individual	Hays, Steve
National Oceanic & Atmospheric Administration	Carlon, Scott
National Oceanic & Atmospheric Administration	Yeager, Justin

ORGANIZATION	NAME
Northwest Power and Conservation Council	Horton, Stacy
Northwest Power and Conservation Council	Mounts, Sara
State Attorney General Office	Kirigin, Lauren
Upper Columbia Salmon Recovery Board	Bowerman, Tracy
US Bureau of Reclamation	Hoff, Gina
US Bureau of Reclamation	Archuleta, Shannon
US Fish and Wildlife Service	Nelle, R.D.
US Fish and Wildlife Service	Gale, William
US Fish and Wildlife Service	Kokos, Sonja
US Fish and Wildlife Service	Muir, Kenneth
US Fish and Wildlife Service	Neibauer, Judy
Washington State Department of Ecology	Peterschmidt, Mark
Washington State Department of Ecology	Zimmerman, Breean
Washington State Department of Ecology	Oreiro, Tyson
Washington State Department of Fish and Wildlife	Burgess, Dave
Washington State Department of Fish and Wildlife	Heironimus, Laura
Washington State Department of Fish and Wildlife	Murdoch, Andrew
Washington State Department of Fish and Wildlife	Verhey, Patrick
Washington State Department of Fish and Wildlife	Blank, Benjamin
Washington State Department of Fish and Wildlife	Jackson, Chad
Washington State Dept of Natural Resources	Huinker, James
Washington State Dept of Natural Resources	Preston, Cindy
Washington State Parks	Fielding, Andrew
Washington State Parks	Harris, Chelsea

Table B-2 Comments Received

Comment #	Comment Date	Name/Entity	Document or Report Name	Stakeholder Comment	Chelan PUD Response
I-1-1	7/07/22	Brock Laughlin	Rock Island Water Quality Monitoring Study Plan	The Rock Island project boundary encompasses a series of ponds located near the Rock Island dam in and around the City of Rock Island. The water Quality study should include these ponds as they were created by the raising of the water level in the reservoir. It is important that the water quality study include these ponds and that the quality of this water be evaluated and mitigated if needed. Please include these ponds as an element of the water quality study. Thank You	Chelan PUD is presently reviewing existing information on the Rock Island Ponds. Chelan PUD may propose a separate study once the data gaps for the Rock Island Ponds are identified.
A-1-1	7/08/22	Breean Zimmerman, Washington State Department of Ecology	Rock Island Water Quality Monitoring Study Plan	1. Other environmental data resources to consider, if they haven't already, would include WQ Portal and NAWQA. (Section 5.0)	A majority of the Discharge Monitoring Reports identified in Section 5 will be accessed through the WQ Portal. We have added the USGS National Water Information System (NWIS) as a source, which was already included in our data review but not cited explicitly. Based on our review of NAWQA, it appears to be a broader nationwide study that derives data from various sources including the NWIS. We did not find any specific data sources in the NAWQA study regarding nutrients or other parameters within the Columbia River reach that is being considered in this Water Quality Monitoring Study.
A-1-2	7/08/22	Breean Zimmerman, Washington State Department of Ecology	Rock Island Water Quality Monitoring Study Plan	2. The Study Plan references a "growing and non-growing season"; it is assumed this is referring to the aquatic plant growing season (e.g., plants and algae). It would be helpful to provide a definition as to what the growing and non-growing season is referencing and the basis of selecting the stated monitoring timeframe.	This is correct. We have generally referred to growing season as being from June – September, and non-growing season encompassing the rest of the year from winter through the following spring. These are intended to be operational definitions rather than strict biological definitions, with the objective of maximizing data collection during the warmest, low flow conditions in the year when the longest photoperiods occur. These are generally consistent with the critical periods identified in the EPA's Columbia and Snake Rivers Temperature TMDL. A footnote was added to the Study Plan to define the growing and non-growing seasons.
A-1-3	7/08/22	Breean Zimmerman, Washington State Department of Ecology	Rock Island Water Quality Monitoring Study Plan	3. The Study Plan discussed taking temperature measurements at increments of 3 – 5 meters in depth to determine if a thermocline is present. More detail here is recommended. For example, how deep do you plan to take measurements? Further, taking temperature measurements in combination with DO measurements would be useful to characterize conditions when conducting this incremental sampling.	The depth profile field measurements will be collected down to the approximate mid-depth of turbine intake (18 m). We intend to collect both temperature and DO measurements concurrently with the field probe (as discussed in Section 7.2 of the Study Plan).
A-1-4	7/08/22	Breean Zimmerman, Washington State Department of Ecology	Rock Island Water Quality Monitoring Study Plan	4. At the mid-depth WQ sample, if a thermocline exists, what is the purpose for collecting this sample? Will Chelan PUD also be trying to characterize conditions in lower depths below the thermocline? Ecology recommends gathering data throughout the water column for these water quality multimeter casts.	Yes. This is the objective of collecting a field temperature depth profile. If the water column is determined to be stratified on the day of sampling, then the field measurements of temperature, DO and pH will be taken within 1 m of the bottom, and the depth of the water grab samples will be adjusted to represent the surface mixed layer, thermocline and the hypolimnion as indicated in the field temperature

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
					profile. We have added clarifications to Sections 7.1 and 7.2 to make this clear.
A-1-5	7/08/22	Breean Zimmerman, Washington State Department of Ecology	Rock Island Water Quality Monitoring Study Plan	5. How will you define a thermocline from the data collected? What definition, in terms of change in temperature per depth, will the PUD rely on to determine whether a thermocline exists? Should consider performing the forebay multimeter water column casts a far enough distance from the face of the dam so the data collected are not influenced by vertical water movement due to intake structures.	The field temperature depth profile will be used to determine whether the water column is stratified. We will look for a change in temperature gradient with depth. While the vertical gradients used to identify the thermocline can be highly variable, we will use a generally accepted guidance for the vertical gradient provided in Wetzel (2001) of approximately 1°C/m or higher to identify whether a thermocline is present on the day of the sampling event, and if so, reposition the WQ grab samples as described in the response above to Comment A-1-4. The forebay samples will be collected just off the buoys outside the boat restriction zone. This would move the samples farther away from the dam face and would avoid the turbulence in the vicinity of the intake.
A-1-6	7/08/22	Breean Zimmerman, Washington State Department of Ecology	Rock Island Water Quality Monitoring Study Plan	6. How will the nutrient and carbon parameters be reviewed to characterize the water quality conditions in the system? More information on what analysis the PUD is planning to conduct with these data can help reviewers understand if these parameters are necessary or other parameters may be needed.	Nutrients and organic carbon data are intended to provide basic water quality information on existing conditions. These data may be useful for a variety of purposes including identifying the trophic conditions, and changes in nutrients and organic carbon loads from upstream to downstream.
A-1-7	7/08/22	Breean Zimmerman, Washington State Department of Ecology	Rock Island Water Quality Monitoring Study Plan	7. Will the PUD be relying on DO, pH, and chlorophyll results to determine primary production or will different measurements be used to quantify the relative degree of primary production by season?	The chlorophyll-a, DO and pH data may be used to assess changes in primary production through the season. In addition, chlorophyll-a data may also be used to assess the trophic state of the Rock Island Pool.

From:	RIRelicensing
To:	RIRelicensing
Cc:	"Benjamin.Blank@dfw.wa.gov"; "sghays51@msn.com"; Marcie Clement; "dave.burgess@dfw.wa.gov"; "tracy.bowerman@ucsrb.org"; "bmoran@americanrivers.org"; "jason@ccfeg.org"; "skit@critfc.org"; "murk@yakamafish-nsn.gov"; "kirk.truscott@colvilletribes.com"; "bzim461@ecy.wa.gov"; "Andrew.Murdoch@dfw.wa.gov"; "Patrick.Verhey@dfw.wa.gov"; Nathalie Denis; "Sonja_Kokos@fws.gov"; Alene Underwood; "andrew.fielding@parks.wa.gov"; Audrey Thompson; "rogb@yakamafish-nsn.gov"; "brenthall@ctuir.org"; Brian Odell; Catherine Willard; "chad.jackson@dfw.wa.gov"; "Chelsea.Harris@parks.wa.gov"; "cindy.preston@dnr.wa.gov"; "blod@yakamafish-nsn.gov"; "mild@yakamafish-nsn.gov"; "hare@yakamafish-nsn.gov"; "James.Huinker@dnr.wa.gov"; Kai Steimle; "keith.hatch@indianaffairs.gov"; Lance Keller; "laura.heironimus@dfw.wa.gov"; MaryLouise Keefe; "lamr@yakamafish-nsn.gov"; Scott Hopkins; "shorton@nwcouncil.org"; "ivet@yakamafish-nsn.gov"; "william_gale@fws.gov"; Bill Towey; "RD_Nelle@fws.gov"; "judy_neibauer@fws.gov"; "jason.mclellan@colvilletribes.com"; "bret.nine@colvilletribes.com"; "aaronjackson@ctuir.org"; "justin.yeager@noaa.gov"; "porl@critfc.org"; "Casey.Baldwin@colvilletribes.com"; "Douglas.Marconi@colvilletribes.com"; "scott.carlon@noaa.gov"; "mape461@ecy.wa.gov"; "pmugunthan@fourpeaksenv.com"; "ghoff@usbr.gov"; "cwright@lgl.com"; "drobichaud@lgl.com"; "AudieHuber@ctuir.org"; "jmiller@fourpeaksenv.com"; "SMounts@NWCouncil.org"; "tore461@ecy.wa.gov"; "AHessenius@kearnswest.com"; "krugani@kearnswest.com"; "Paul_Grutter@golder.com"; "eric.doyle@confenv.com"; "mbday@kearnswest.com"; "adahlin@kearnswest.com"; "jdowning@kearnswest.com"; "carj@critfc.org"; Ben Truscott; "kenneth_muir@fws.gov"; "toxostoma495@gmail.com"; Emily Waters; Janel Ulrich; Kate Taylor; "lauren.kirigin@atg.wa.gov"; "sarchuleta@usbr.gov"; "julie.sanderson@co.chelan.wa.us"; "bladescodeservices@yahoo.com"; "bard@critfc.org"; "parb@critfc.org"; "lnagel@fourpeaksenv.com"; "kkennedy@kearnswest.com"
Subject:	RI Relicensing: Water Quality Monitoring Study Plan - Comment Opportunity
Date:	Friday, June 24, 2022 3:38:49 PM
Attachments:	image002.png

Good afternoon, Fish & Aquatic TWG:

We would like your comments on the Rock Island Water Quality Monitoring Study Plan.

CLICK HERE to access the document and submit your comments. Comments are to be submitted by Friday, July 8.

Thank you for your participation.

Kate Taylor
Licensing & Compliance Specialist
Chelan PUD
[M] 509-899-5555
[W] 509-661-4410

Search Comment Items

Public Comment Form

Rock Island Water Quality Monitoring Study Plan

Chelan County PUD invites stakeholders to provide comments on our draft study plan. Please review the document (click "review document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

Your Comment

Comments must be submitted by Friday, July 8, 2022

Review Document

Insert comments on Rock Island Water Quality Monitoring Study Plan

Upload File

Uploading a file is optional

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment, please contact the person listed at the bottom of this page.

Continue »

Rock Island Relicensing Team

RIRelicensing@chelanpud.org

From: Zimmerman, Breean (ECY) <bzim461@ECY.WA.GOV>
Sent: Monday, August 1, 2022 11:00 AM
To: Marcie Clement <Marcie.Clement@chelanpud.org>
Subject: [External] RE: WQ QAPP for RI study

ATTENTION: This email is from bzim461@ECY.WA.GOV. Are you expecting this?
If not, please forward it to our Phishing Hole. Thank You!

Hi Marcie, yes, of course. Ecology's position is that this particular QAPP does not require a formal Ecology approval. The Rock Island 401 water quality certification does not require this particular QAPP, therefore, does not require the formal Ecology approval process. With that being said, this particular QAPP can be reviewed and approved by the designated Ecology staff assigned to manage this 401 water quality certification. Further, this QAPP was developed for information gathering for the relicensing process and was not developed as a requirement of the current water quality certification for Rock Island.

Hope this helps. Let me know if you have additional questions.

Breean Zimmerman
Water Quality Program

From: Marcie Clement <Marcie.Clement@chelanpud.org>
Sent: Monday, August 1, 2022 10:49 AM
To: Zimmerman, Breean (ECY) <bzim461@ECY.WA.GOV>
Subject: RE: WQ QAPP for RI study

Breean,
Would you mind sending me an email explaining that approval isn't needed, as this isn't an Ecology requested study – or however you discussed it over the phone with me please.

Thank you – our licensing team asked if you wouldn't mind.

Marcie

From: Zimmerman, Breean (ECY) <bzim461@ECY.WA.GOV>
Sent: Tuesday, July 19, 2022 10:25 AM
To: Marcie Clement <Marcie.Clement@chelanpud.org>
Subject: [External] RE: WQ QAPP for RI study

ATTENTION: This email is from bzim461@ECY.WA.GOV. Are you expecting this?
If not, please forward it to our Phishing Hole. Thank You!

Hi Marcie, I think the WQ QAPP for the RI study looks good. However, just a small suggestion, might be worthy to add a statement that field sampling will follow equipment decontamination protocols. Particularly, when conducting the periphyton and zooplankton surveys.

Thank you,
Breean Zimmerman
Water Quality Program

From: Marcie Clement <Marcie.Clement@chelanpud.org>
Sent: Friday, July 15, 2022 7:19 AM
To: Zimmerman, Breean (ECY) <bzim461@ECY.WA.GOV>
Subject: WQ QAPP for RI study

Good morning Breean,

I know that Ecology had a few comments regarding the WQ study plan for the RI sampling. We will address those, but was wondering if Ecology approved the QAPP, as we'd like to get out into the field on the 25th of July.

Thank you,
Marcie

Marcie Clement
Program Manager-Water Resources
Public Utility District No.1 of Chelan County | 327 N. Wenatchee Ave. | Wenatchee, WA 98801
509.661.4186 (w) | 509.760.9402 (c) | marcie.clement@chelanpud.org

WATER QUALITY MONITORING 2022-2023 STUDY REPORT

ROCK ISLAND HYDROELECTRIC PROJECT

FERC NO. 943

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

November 2023

WATER QUALITY MONITORING

2022-2023 STUDY REPORT

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

FOUR PEAKS ENVIRONMENTAL SCIENCE & DATA SOLUTIONS
338 S. MISSION STREET
WENATCHEE, WA 98801

November 2023

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TERMS AND ABBREVIATIONS

#	
7DADM	7-day average of the daily maximum
A	
AFDM	ash-free dry mass
C	
CFU	colony forming units
Chelan PUD	Public Utility District No. 1 of Chelan County
CHL	chlorophyll *a*
D	
DART	Columbia River Data Access in Real Time
DO	dissolved oxygen
DOC	dissolved organic carbon
E	
Ecology	Washington Department of Ecology
EIM	Washington Department of Ecology long-term monitoring
F	
FERC	Federal Energy Regulatory Commission
G	
GHCNd	Global Historical Climatology Network daily
K	
kcfs	thousand cubic feet per second
M	
MQO	measurement quality objective
N	
N:P	nitrogen to phosphorus
NH_4	ammonium
NO_x	nitrite plus nitrate
NTU	nephelometric turbidity units
O	
OP	orthophosphate

P

POC	particulate organic carbon
PQL	practical quantitation limit

Q

QAPP	Quality Assurance Project Plan

R

RIGW	United States Army Corps of Engineers Rock Island tailrace gage
Rock Island Project	Rock Island Hydroelectric Project FERC No. 943
RPD	relative percent difference
RRDW	United States Army Corps of Engineers Rocky Reach tailrace gage

S

SM	Standard Method
Study Plan	2022-2023 Water Quality Monitoring Study Plan

T

TDG	total dissolved gas
TKN	total Kjeldahl nitrogen
TMDL	Total Maximum Daily Load
TN	total nitrogen
TOC	total organic carbon
TP	total phosphorus
TSI	Trophic State Index
TSS	total suspended solids

U

USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Rock Island Project). The Rock Island Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Rock Island Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Rock Island Project, which will use the Integrated Licensing Process. Chelan PUD intends to incorporate findings of this report in the Pre-Application Document, which will be filed with FERC and distributed to relicensing participants when the ILP commences in late 2023.

A water quality monitoring study was conducted in support of the Rock Island Project relicensing, as described in the Water Quality Monitoring Study Plan (Study Plan; Four Peaks 2022). This report presents findings from monitoring efforts conducted in 2022-2023.

2.0 STUDY OBJECTIVES

The Study Plan reviewed existing water quality data sources and concluded that water quality information on the mainstem Columbia River between the tailrace of Rocky Reach Dam and the tailrace of Rock Island Dam is largely limited to temperature and total dissolved gas (TDG; Four Peaks 2022). Information on other basic water quality parameters, such as dissolved oxygen (DO), pH, turbidity, suspended solids, nutrients, and productivity, is not available or is very limited in spatial and temporal extents in the mainstem Columbia River within the Rock Island Project Boundary. Long-term water quality data are available at the mouth of the Wenatchee River (the largest tributary within the Rock Island Project reach).

To address the data gaps in the mainstem Columbia River within the Rock Island Project Boundary, the Study Plan proposed collecting basic water quality data entering and leaving the Rock Island Project Boundary. The primary objectives of the monitoring were:

- To collect information necessary to supplement existing information to evaluate potential water quality effects of the Rock Island Project; and
- To provide water quality data to support Washington Department of Ecology's water quality certification for the FERC relicensing of the Rock Island Project.

The basic water quality data collected in this study include DO, pH, turbidity, suspended solids, nutrients, bacteria, and productivity at the lower trophic levels. This study did not collect TDG or continuous temperature data because these data are already available and will continue to be collected by Chelan PUD as part of its current FERC license requirements for the Rock Island Project.

3.0 GEOGRAPHIC SCOPE

The Rock Island Project is located on the Columbia River near the cities of Wenatchee and East Wenatchee in Chelan County and Douglas County, Washington, from river mile (RM) 453.4 to RM 473.7 (NMFS 2002). The geographic extent of the water quality monitoring spanned from the tailrace of Rocky Reach Dam to the tailrace of Rock Island Dam on the mainstem Columbia River. Specifically, monitoring occurred at the following locations (Figure 3-1):

- Tailrace of Rocky Reach Dam;
- Forebay of Rock Island Dam; and
- Tailrace of Rock Island Dam.

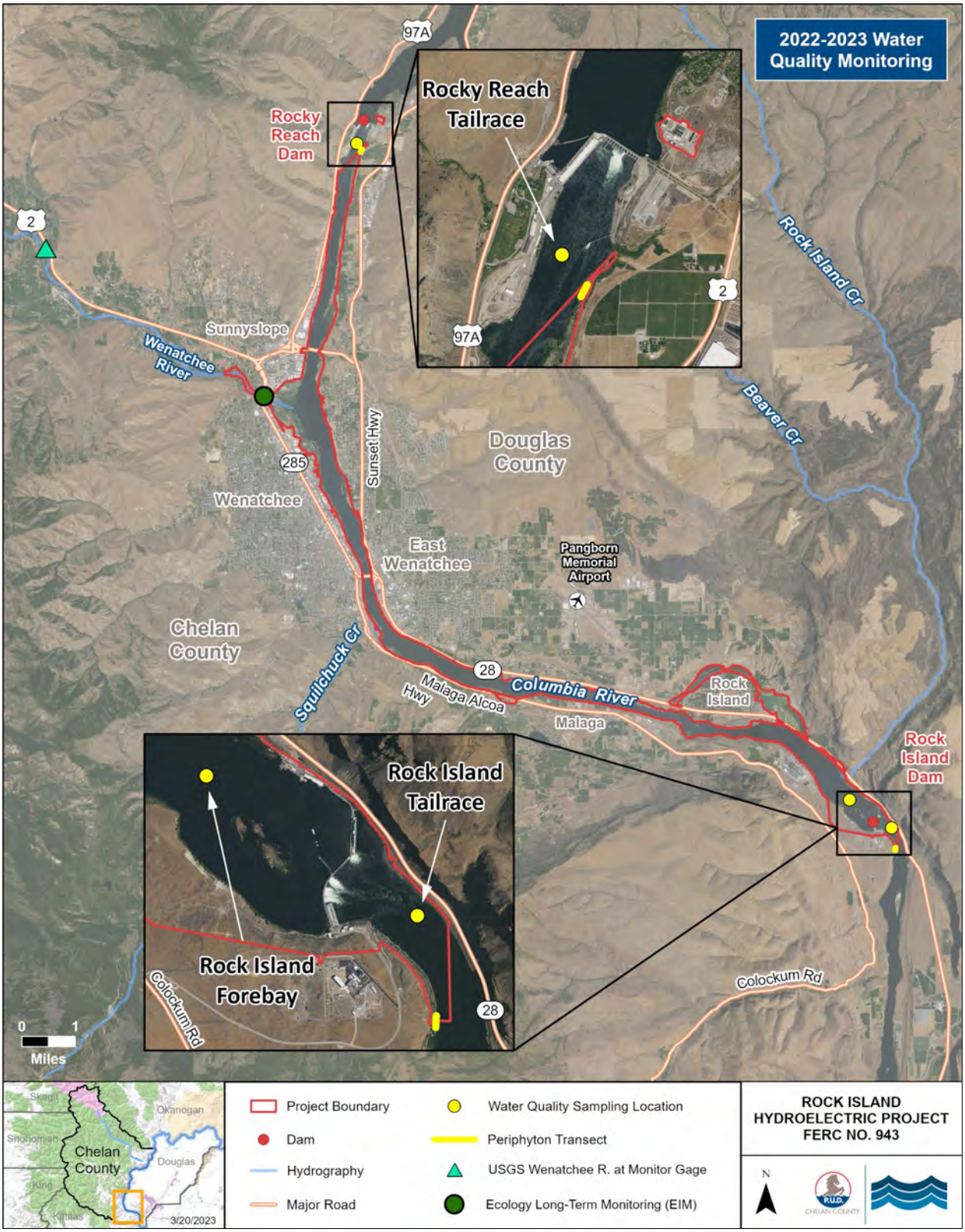


Figure 3-1 Water Quality Monitoring Locations

4.0 METHODS

Water quality monitoring followed the procedures established in the Quality Assurance Project Plan (QAPP; Study Plan Appendix A [Four Peaks 2022]). The sample collection, handling, and field and laboratory data quality control procedures are described in the sections below. The dates of the field sampling events are shown in Table 4-1.

Table 4-1 Dates for Field Sampling Events

SAMPLING DATE	PHYSICAL AND CHEMICAL WATER QUALITY	PERIPHYTON AND ZOOPLANKTON
July 26, 2022	X	
August 8-9, 2022	X	X
September 5, 2022	X	
October 3-4, 2022	X	X
January 25/February 14, 2023*	X	X
April 18-19, 2023	X	X
June 6, 2023	X	
July 5-6, 2023	X	X
August 8, 2023	X	
September 5, 2023	X	

*A second round of winter periphyton sampling was conducted in February because January chlorophyll *a* samples were not processed in time to get a reliable measurement.

4.1 Sample Collection

4.1.1 Water Quality Grab Samples

Water quality samples were collected using a Van Dorn sampler at all three study locations.

At the Rock Island and Rocky Reach Dam tailraces, water samples were collected at a depth of approximately 3.3 ft (1 m), following standardized protocols for surface water quality sampling (Ecology 2017 and 2019a).

In the Rock Island Dam forebay, water samples were collected at approximately 3.3 ft (1 m) below the water surface and at the midpoint of the turbine intake (approximately 59 ft [18 m]). The Study Plan required collection of a third sample in the Rock Island Dam forebay within the thermocline if field measurements of temperature (Section 4.1.2) indicated a stratified water column. Since none of the field events indicated any evidence of a thermocline, the third sample was taken halfway between the surface and turbine intakes (approximately 32.8 ft [10 m]).

One set of duplicate water quality samples was collected per event, with the location of the duplicate sample cycled among the sampling sites for each event. Water quality samples were analyzed at AmTest laboratory in Kirkland, WA, which is accredited by the Washington Department of Ecology (Ecology; Accreditation No. C554-22).

4.1.2 In Situ Measurements

Instantaneous field measurements of DO, pH, turbidity, and temperature were collected using a YSI ProDSS digital water quality meter near the surface (top 3.3 ft [1 m]) at all three sampling locations and at 6.6 ft (2 m) intervals in the Rock Island Dam forebay, extending down to the depth of the mid-turbine intake (59 ft [18 m]), following the Ecology protocols for in situ measurements (Ecology 2019b). A set of duplicate field measurements per event was also collected as required in the QAPP. Pre- and post-event calibration checks were performed as outlined in the QAPP.

Forebay temperature measurements were used to construct a temperature profile in the field to determine whether the forebay was stratified. This informed both the water quality grab and zooplankton sampling methods in the forebay. As discussed in Section 5.2.1, the Rock Island Dam forebay was not stratified during any of the field events in 2022 or 2023. Therefore, the samples were collected at approximately the mid-depth between the turbine intake and the water surface.

4.1.3 Periphyton

Periphyton samples were collected from 262.5 ft (80 m) reaches in shallower areas at the Rocky Reach and Rock Island tailrace locations. These samples were then shipped to the Ecology-accredited laboratory EcoAnalysts, Inc. (Accreditation No. C897-22) for analysis of ash-free dry mass (AFDM) biomass and chlorophyll. Major taxa were also identified once per growing season. Periphyton samples were collected from representative rocks across the reach that were relatively flat and similar in size. These samples were then combined into a composite sample for the reach, following the Ecology coarse substrate protocol (Ecology 2019c), which was adapted for a large river. Periphyton was scraped from an area of 6.8 square inches (44.18 square cm), equivalent to the area of a 3-inch [7.5 cm] ring, taken from the tops of eight rocks across the reach. Additionally, eight rocks were collected across the transect for taxonomy sampling (Photo 4-1). Further details of sample collection, handling, processing, and quality control methods are described in the QAPP.

Photo 4-1 Rocky Reach Tailrace Periphyton Transect Facing Upstream in August 2022 (left) and October 2022 (right)

4.1.4 Zooplankton

Zooplankton samples were collected near the water surface (approximately 3.3 ft [1 m]) at all three water quality sampling locations. For the tailrace locations, samples were collected using a battery-powered diaphragm pump filtering 15.9 gallons (60 L) of water through a 153 µm mesh net into a calibrated catch bucket. This method follows the procedures for zooplankton collection from large riverine systems discussed in Appel et al. (2020). Because of the low zooplankton levels in the water column in the 2022 samples, the filtered volume was increased to 26.4 gallons (100 L) in April 2023 to ensure a representative sample.

In the QAPP, sampling was planned for both stratified and fully mixed conditions. The pump method to collect zooplankton samples is appropriate under fully mixed conditions. If the forebay had been stratified, vertical tows using a 153 µm net would have been conducted across the entire water column to capture zooplankton below, within, and above the thermocline.

However, as described in Section 5.2.1, the Rock Island Dam forebay was not stratified during the zooplankton sampling events. Thus, the pump method was adopted as described above to collect samples from the forebay. All collected samples were preserved in ethanol at the time of collection and subsequently shipped to the laboratory (EcoAnalysts, Inc.) for taxonomic identification and enumeration.

4.2 Analytical Methods

4.2.1 Water Quality Grab Samples

Water quality grab samples were analyzed for nutrient, organic carbon, chlorophyll *a*, and total suspended solids (TSS) parameters using the methods and quantitation levels described in Table 4-2. Accuracy was determined in the laboratory by control samples, method blanks, matrix spikes, matrix spike duplicates, and field duplicates.

Table 4-2 Analytical Methods and Quantitation Limits for Laboratory Analytes

PARAMETER	METHOD	QUANTITATION LEVEL
Total phosphorus	Standard Method (SM) 4500-PF	1 microgram/liter (µg/L)
Orthophosphate	SM 4500-PE	1 µg/L
Total dissolved phosphorus	SM 4500-PF	1 µg/L
Nitrite plus nitrate	EPA 353.2	20 µg/L
Nitrite	SM 4500-NO2B	3 µg/L
Total ammonium	EPA 350.1	20 µg/L
Total Kjeldahl nitrogen	EPA 351.2	250 µg/L
Organic nitrogen	SM 4500-N	100 µg/L
Chlorophyll *a*	APHA 10200 H	0.3 µg/L
Total organic carbon	SM 5310B	200 µg/L
Dissolved organic carbon	SM 5310B	500 µg/L
Alkalinity	SM 2320B	1 mL/L
Total suspended solid	SM 2540D	1 mL/L
E. coli	SM 9222D	1 colony forming unit per 100 mL

Source: Four Peaks 2022
Note: Water quality standard units are expressed using the metric system unless otherwise noted.

4.2.2 Periphyton

For each quarterly sampling event, periphyton samples were analyzed for AFDM and chlorophyll *a* concentrations. AFDM was estimated by drying a portion of the sample and incinerating the organic material. Chlorophyll *a* concentrations were estimated using fluorometry. When necessary, samples were diluted to facilitate analysis due to high sample concentrations and the presence of sediments.

As required in the QAPP, major taxa were identified for the summer event: soft-body algae and diatoms were identified to the lowest practical taxonomic level in a Palmer-Maloney counting chamber, with a diatom slide created to place lowest practical identifications on live diatoms found

in the soft body portion. Counting continued until 100 natural units were identified and no new taxa were encountered.

4.2.3 Zooplankton

Zooplankton were identified and counted to the lowest practical taxonomic level using a subsample of 200 to 400 coarse and fine individuals, where necessary.

4.3 Data Quality Control

4.3.1 Laboratory Samples

Bias was expressed as the percent recovery of the measured value relative to the true or expected value. Deviation outside the expected range of percent recovery would have indicated bias. Precision was determined through the relative percent difference (RPD) between the replicates (field or laboratory). The percent recovery and RPD limits for this monitoring program (Table 4-3) were derived from past surveys and examples provided in Ecology's QAPP guidance document (Ecology 2004).

Table 4-3 Measurement Quality Objectives for Laboratory Samples

PARAMETER	LABORATORY CONTROL SAMPLE STANDARD PERCENT RECOVERY LIMITS	LABORATORY CONTROL SAMPLE DUPLICATES RELATIVE PERCENT DIFFERENCE (RPD)	MATRIX SPIKES PERCENT RECOVERY LIMITS	MATRIX SPIKE DUPLICATES RPD	FIELD DUPLICATES RPD
Total phosphorus	80-120	<= 20	75-125	NA	<= 20
Orthophosphate	80-120	<= 20	75-125	NA	<= 20
Total dissolved phosphorus	80-120	<= 20	75-125	NA	<= 20
Nitrite plus nitrate	80-120	<= 20	75-125	NA	<= 20
Nitrite	80-120	<= 20	75-125	<=20	<= 20
Total ammonium	80-120	<= 20	75-125	NA	<= 20
Total Kjeldahl nitrogen	80-120	<= 20	75-125	NA	<= 20
Organic nitrogen	80-120	<= 20	75-125	NA	<= 20
Chlorophyll *a*	80-120	<= 20	NA	NA	<= 20
Total organic carbon	80-120	<= 20	75-125	NA	<= 20
Dissolved organic carbon	80-120	<= 20	75-125	NA	<=20
Alkalinity	80-120	<=20	NA	NA	<=25
TSS	80-120	<=20	NA	NA	<=25
E. Coli	NA	<=20	NA	NA	<=25

Source: Four Peaks 2022

Completeness was assessed as the proportion of valid analytical measurements relative to the total number of measurements. The measurement quality objective (MQO) for all components of this monitoring program is 90 percent. Data qualified as estimated during validation were considered valid for the purpose of evaluating completeness. Only data qualified as rejected during data validation were excluded when evaluating completeness.

4.3.2 In Situ Measurements

Instantaneous temperature, DO, pH, and turbidity measurements were conducted using a YSI ProDSS digital water quality meter. The instrument met the minimum specifications for these parameters as required in the QAPP (and listed below in Table 4-4). The MQOs are listed in Table 4-5. The instrument was calibrated at the start of each sampling event. Post-event calibration checks were conducted to test the instrument for drift using calibration standards or known values. Data were qualified according to the acceptance ranges listed in Table 4-5. Precision was determined through the RPD between the field replicates. Completeness was assessed as the proportion of valid measurements relative to the planned total number of measurements.

Table 4-4 Instrument Specifications

INSTRUMENT	PARAMETER (UNIT)	RANGE	ACCURACY	RESOLUTION
Multi-parameter Water quality meter	Temperature (°C)	-5 to 40	± 0.2	0.1
	DO (mg/L)	0 to 20	0 to 20 mg/L (± 0.1 mg/L or 1% of reading, whichever is greater)	0.1
	pH	0 to 14	± 0.2	0.01
	Turbidity (nephelometric turbidity units [NTU])	0 to 2,000	0 to 999 NTU (0.3 or ± 2% of reading, whichever is greater); >1,000 (± 5% of reading)	0.1 NTU

Source: Four Peaks 2022
Note: Water quality standard units are expressed using the metric system unless otherwise noted.

Table 4-5 Measurement Quality Objectives for Instantaneous Field Measurements

PARAMETER (UNIT)	METHOD	BIAS			PRECISION (RPD)	COMPLETENESS (PERCENT)
		ACCEPT	QUALIFY	REJECT		
Temperature (°C)	SN2550	± 0.2	± (0.2 – 0.4)	> 0.4 or <-0.4	10	90
DO (mg/L)	Manufacturer Protocol	± 0.2	± (0.2 – 0.4)	> 0.4 or <-0.4	10	90
pH	SM4500H	± 0.2	± (0.2 - 0.4)	> 0.4 or <-0.4	10	90
Turbidity (NTU)	ASTM D7725	± 4.0	± (4.0 - 8.0)	> 8.0 or <-8.0	10	90

Source: Four Peaks 2022
Note: Water quality standard units are expressed using the metric system unless otherwise noted.

4.3.3 Periphyton

Periphyton samples were validated by having a secondary taxonomist perform soft body identification on a second aliquot of 10 percent of the samples to assess whether ≥ 90 percent of the taxa identified were similar. All data met these quality criteria.

4.3.4 Zooplankton

Zooplankton samples were validated by having a secondary taxonomist perform a re-identification on the counted aliquot of 10 percent of the samples throughout the duration of the study. Percent similarity needed to be ≥ 90 percent for the sample to pass quality control. All data met these quality criteria.

4.4 Data Analysis

4.4.1 Water Quality Data

Water quality data were assessed using bar charts and time series charts. To establish a context for baseline conditions, historical air temperature and precipitation data from Pangborn Memorial Airport (Global Historical Climatology Network daily [GHCNd] ID USW00094239) were used (NOAA 2023). Water temperature and discharge data for the Wenatchee River near the mouth were downloaded from the United States Geological Survey (USGS) gage at Monitor (12462500; USGS 2023), and from the Columbia River Data Access in Real Time (DART) (Columbia Basin Research 2023) for Rocky Reach and Rock Island United States Army Corps of Engineers (USACE) tailrace gages (RRDW and RIGW, respectively).

Hourly DART water temperature data that deviated by more than 3°C (5.4°F) from the adjacent (+/- 1) hourly readings, or 2°C (3.6°F) from the 7-day average of the daily maximum (7DADM) water temperature, were filtered out to account for potential sensor malfunction or air exposure. Subsequently, the 7DADM water temperature was recalculated using the filtered dataset for the period of record at the corresponding station[1]. The 2022 7DADM water temperatures were compared to the long-term median for each day of the year, as well as the 10th and 90th percentile 7DADM temperatures at each location. Discharge data for 2022 at all three locations were also compared to the 25-year median, along with the 10th and 90th percentiles of the daily average flow at each location.

[1] Period of record = eight years at Wenatchee River USGS gage 12462500, 25 years at USACE RRDW and RIGW DART stations.

In situ measurements and laboratory results from water quality grab samples from the Rocky Reach tailrace, Rock Island forebay, and Rock Island tailrace were evaluated alongside water quality data collected at the Ecology long-term monitoring (EIM) station (station ID 45A070) situated near the mouth of the Wenatchee River. This evaluation aimed to assess seasonal trends between mainstem and tributary inflow. Where applicable, measured values were compared against water quality standards for parameters for the mainstem Columbia River.

The Trophic State Index (TSI; Table 4-6) was calculated for chlorophyll *a* (CHL) and total phosphorus (TP), following the methodology described by Carlson (1977). Total nitrogen (TN) was not used as an indicator of the trophic status, as the system was determined to be phosphorus limited.

Table 4-6 Trophic State Indices

PARAMETER	FORMULA
CHL	TSI(CHL) = 9.81 ln(CHL) + 30.6
TP	TSI(TP) = 14.42 ln(TP) + 4.15

Source: Carlson 1977

4.4.2 Periphyton

Community metrics including the total number of divisions, genera richness, and percentage of diatoms were calculated for each location (Hill et al. 2000; Stevenson and Bahls 2002).

4.4.3 Zooplankton

Taxon abundance, the percent dominance of the three most abundant taxa, and species richness were calculated for each location. Diversity and evenness measures including Shannon Diversity index (Shannon 1948), Margalef's Richness (Margalef 1951), Pielou's Evenness Index (Pielou 1966), and Simpson's Heterogeneity Index (Simpson 1949) were also calculated.

5.0 RESULTS

This section presents the monitoring data results from 2022-2023 sampling events. Meteorological, flow, and temperature conditions are discussed first to provide context for the water quality monitoring results.

5.1 Ambient Conditions

5.1.1 Meteorology

The 2022 and 2023 daily minimum and maximum air temperatures at Pangborn Memorial Airport (GHCND ID USW00094239) are shown in Figure 5-1 and Figure 5-2. These figures provide a comparison to the long-term median values and the 10th and 90th percentiles (represented by the shaded area) of the daily minimum and maximum air temperatures for the corresponding day of the year. The long-term air temperatures reflect the seasonal cycles of cold winters and relatively dry and hot summers in the Wenatchee area.

In 2022, winter air temperatures fluctuated around the long-term median. However, the spring months of April and May were consistently cooler, followed by a return to relatively normal temperatures from June through mid-July. Subsequently, warmer-than-normal temperatures prevailed from mid-July through September, followed by cooler-than-normal temperatures in the fall, leading into winter.

In contrast, 2023 saw more variability in winter temperatures and reached the long-term 90th percentile and 10th percentile in both February and March. Overall temperatures in March and April were primarily below the median normal temperature, but May through most of June remained above the median, with an abnormal cold snap at the end of June. Temperatures for the rest of the summer were variable but generally within the long-term 10th and 90th percentiles, except during a heat wave in early-to-mid August. In September, maximum daily temperatures mostly remained within the normal range, while minimum temperatures tended to be above the daily median.

Total precipitation in water year 2022 amounted to 8.8 in., surpassing both the 30-year median of 7.6 in. and the 5-year rolling average of 7.1 in. (Figure 5-3). There were unusually high precipitation totals from April through July (Figure 5-4). In contrast, 2023 marked a slightly-below-median water year through September. Although January and August recorded precipitation totals slightly above the 75th percentile, most monthly totals were at or below the median.

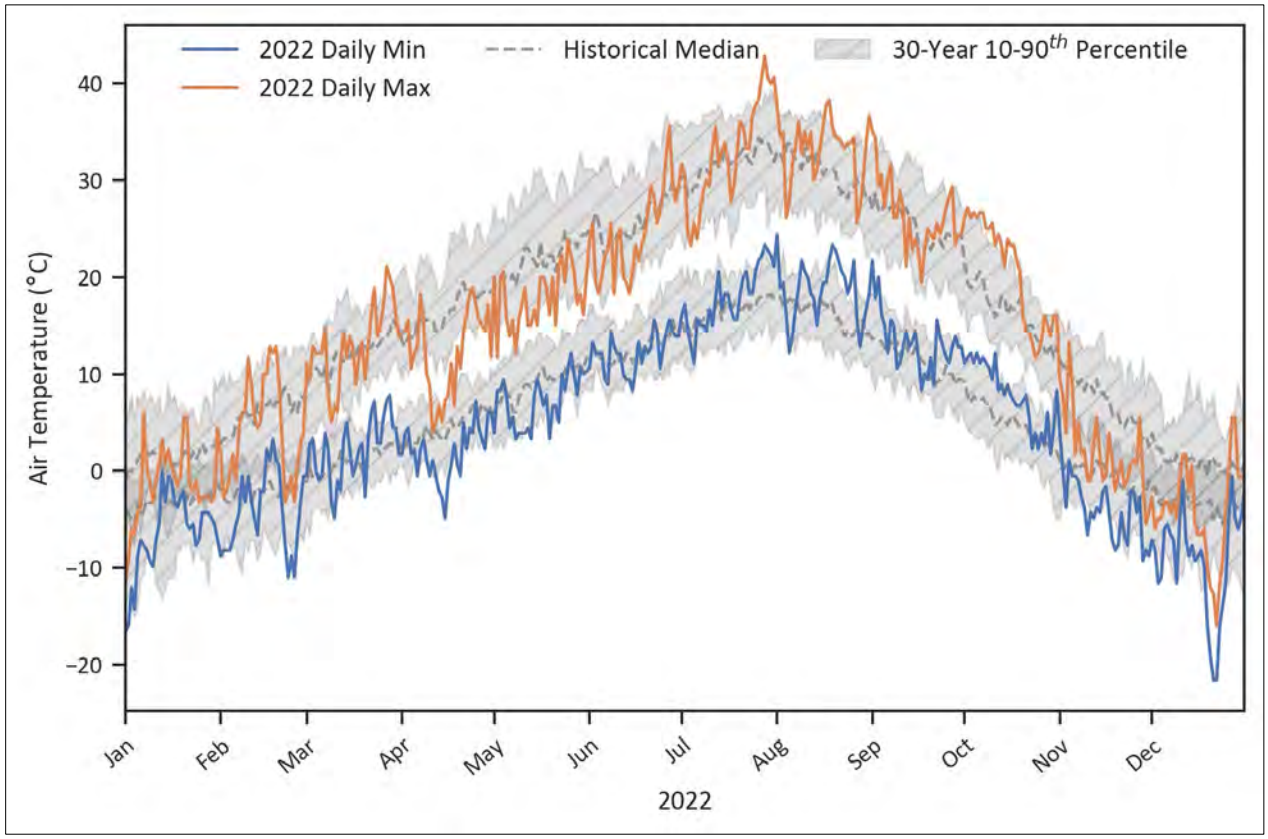
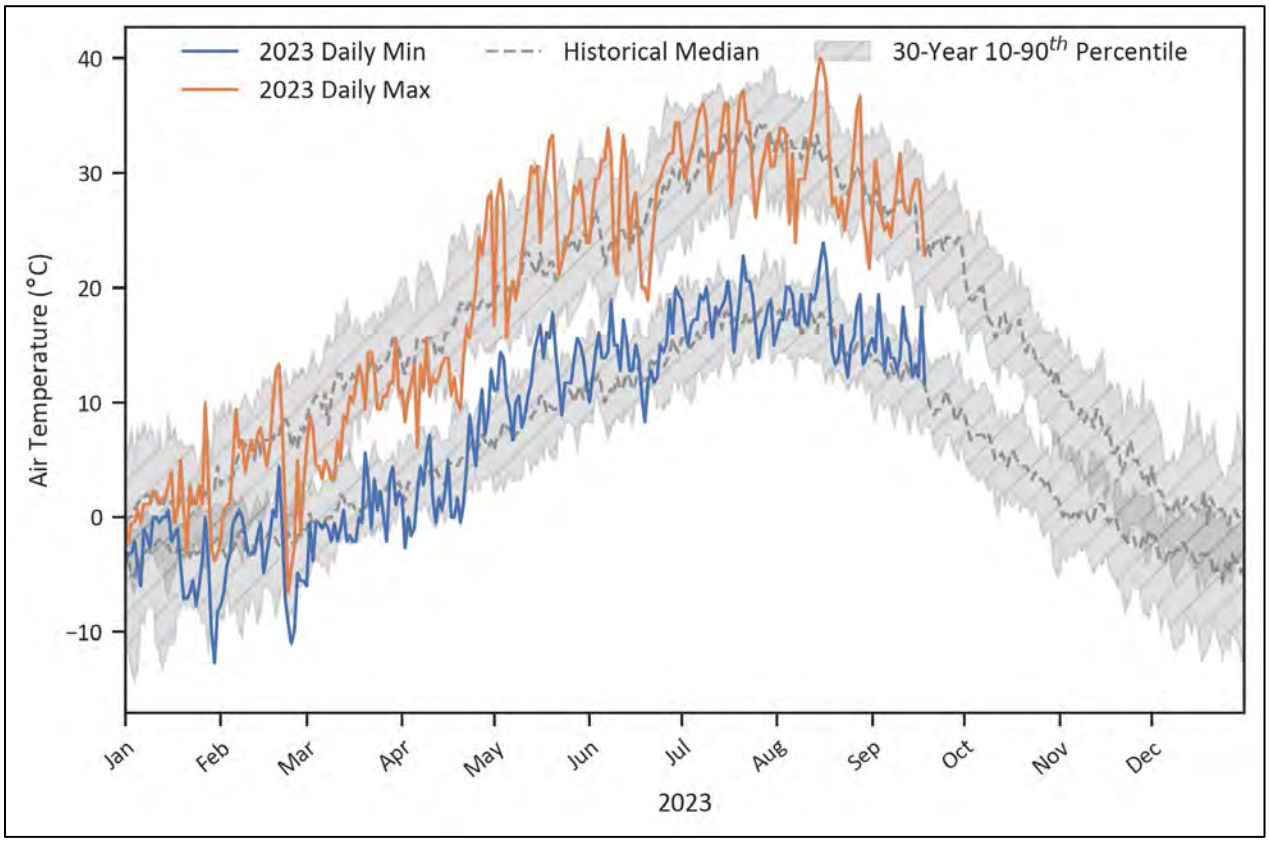
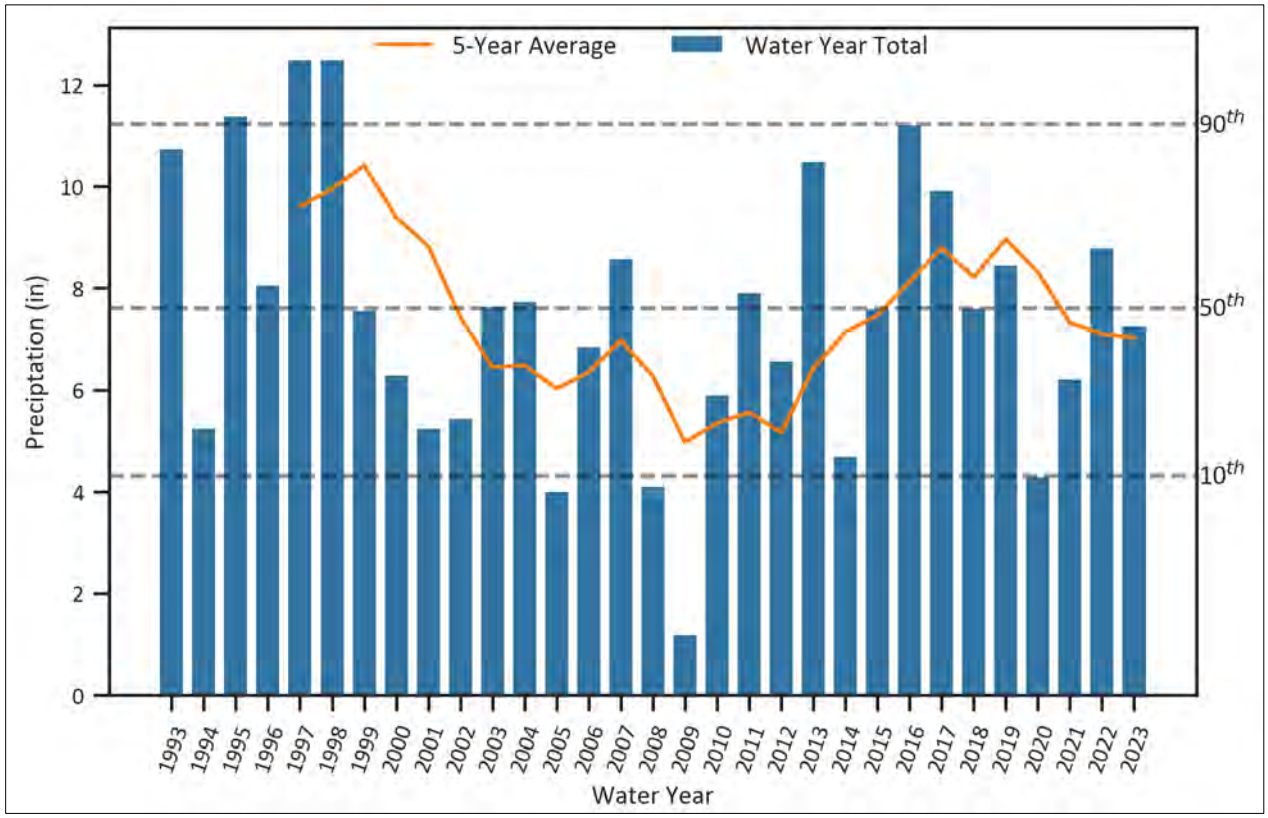


Figure 5-1 Minimum and Maximum 2022 Daily Temperatures at Pangborn Memorial Airport (GHCND ID USW00094239)



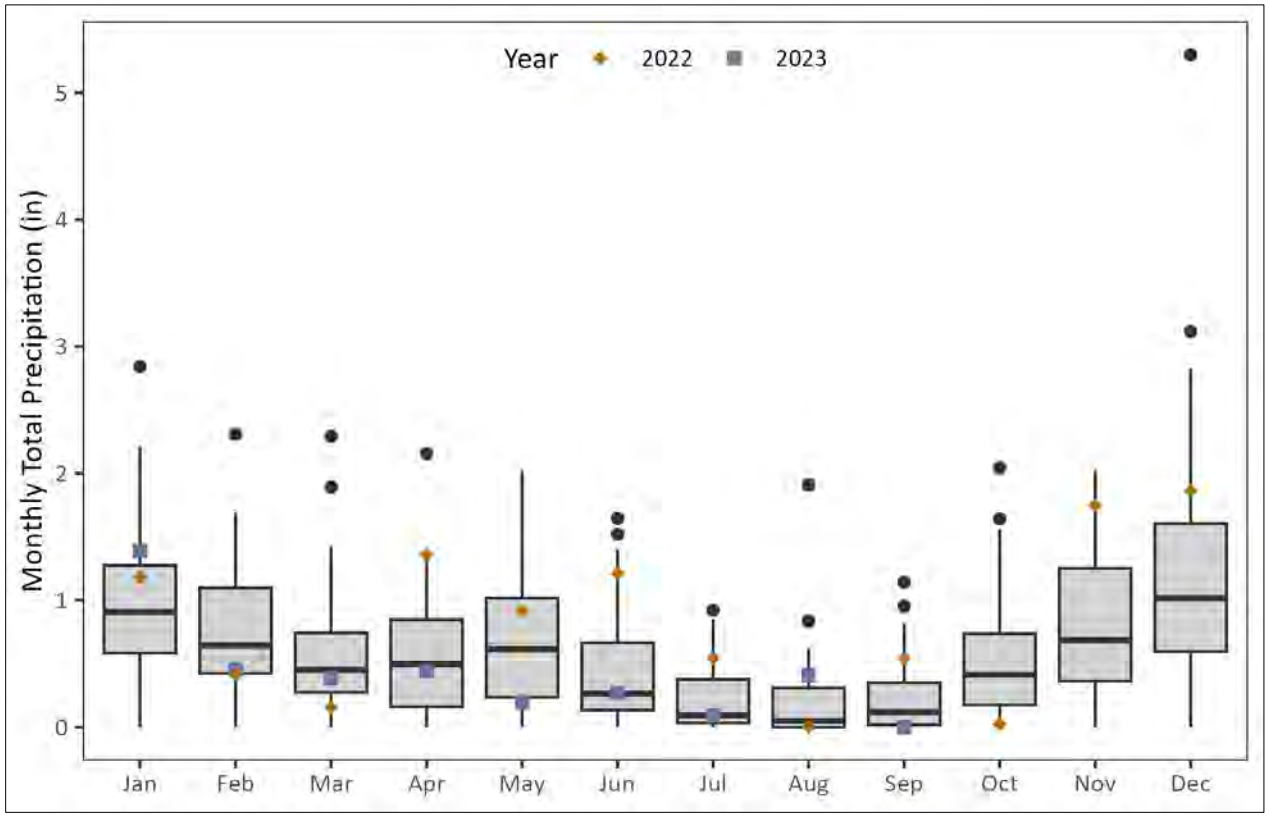
Source: NOAA 2023

Figure 5-2 Minimum and Maximum 2023 Daily Temperatures at Pangborn Memorial Airport (GHCND ID USW00094239)



Source: NOAA 2023
Note: 2023 data only extends through September 17

Figure 5-3 Historical Total Water Year Precipitation with 5-Year Rolling Average and 10th, 50th, and 90th Percentiles for the Historical Period (1993-2023)



Source: NOAA 2023
Note: Orange diamonds and blue squares represent 2022 and 2023 monthly total precipitation, respectively; boxplot midlines represent the median total monthly precipitation across the 30-year historical period (1993-2023), while upper and lower box values represent 75th and 25th percentiles, respectively. 2023 data extends through September 17.

Figure 5-4 Monthly Total Precipitation for 2022-2023 Compared to the Historical Record at Pangborn Memorial Airport

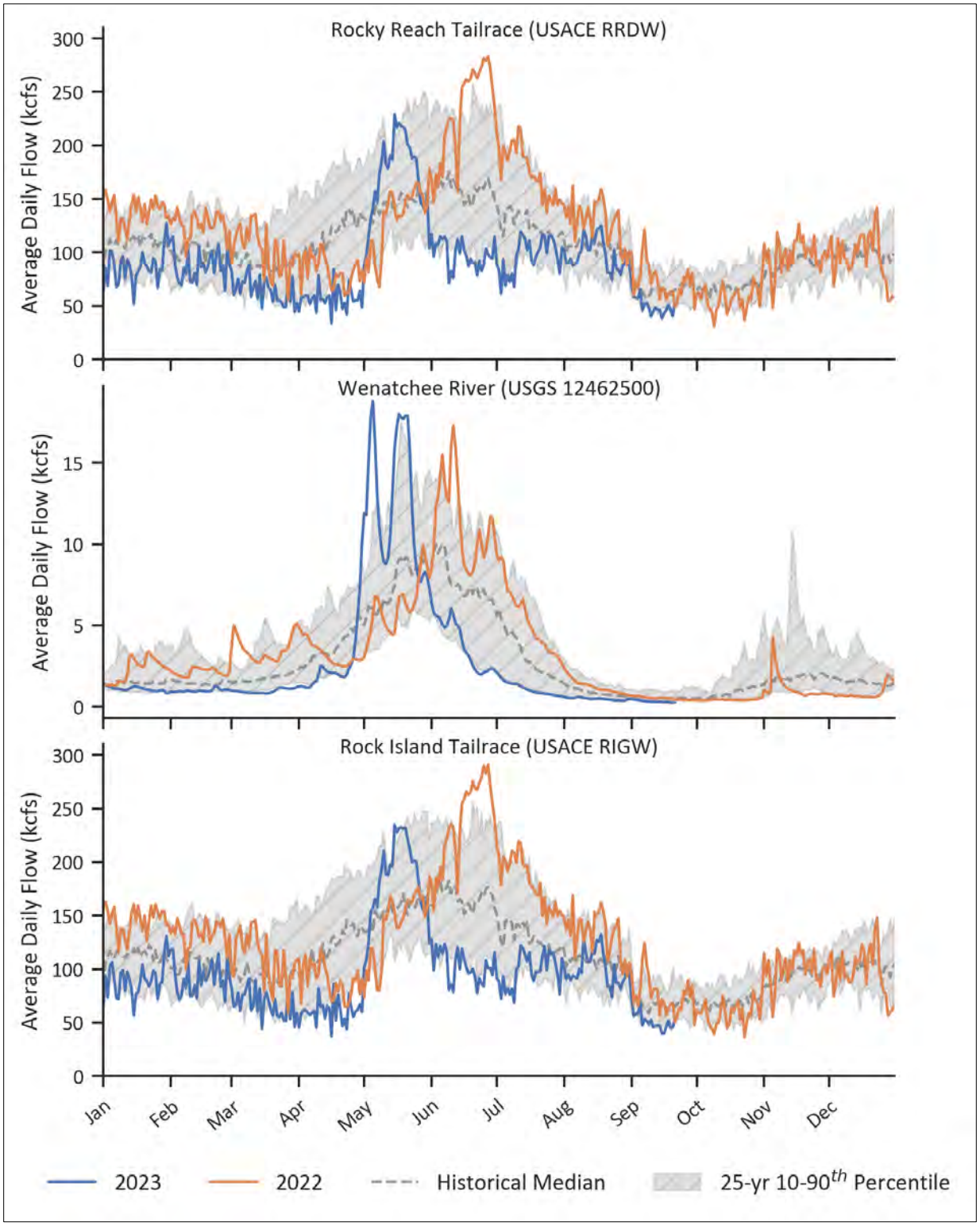
5.1.2 Flows

Inflows into the Rock Island Project from Rocky Reach Dam and the Wenatchee River and outflows from the Rock Island Project are shown in Figure 5-5. In 2022, flows were high throughout the summer (Figure 5-5) at all three locations, reflecting a relatively wet spring and summer (Figure 5-4). Peak discharge in the lower Wenatchee River occurred in June (17.3 thousand cubic feet per second [kcfs]) and was above the 90th percentile on that day (10.6 kcfs). Peak discharge in the mainstem Columbia at both Rocky Reach and Rock Island dams also occurred in June (283.1 and 290.9 kcfs, respectively), and flows were greater than the 90th percentile of historical flows for much of the month. Discharge was greater than the historical median through the end of July in the Wenatchee River and into August in the mainstem Columbia. Flows dropped to more typical levels in September and largely remained within the historical 10th and 90th percentiles for the rest of the year.

By contrast, 2023 flows across locations were mostly below the median during the winter through late spring, followed by close to or above 90th percentile peak flows in May and then a return to below-median flows through the beginning of June. These trends were especially pronounced in the Wenatchee River, where the abnormally low flows continued through the end of the available 2023 data (mid-September). Flows in the mainstem were closer to long-term median in July and August but dropped to close to the 10th percentile of historical daily flows during that period.

Overall, Rock Island Dam flows closely mirrored Rocky Reach Dam flows because Rock Island is a run-of-river[2] project and inflows from Wenatchee River are much smaller than mainstem flows and do not notably alter the hydrograph in the mainstem.

[2] A "run-of river" hydroelectric project is where the daily inflow is approximately equal to the daily outflow and where little or no water is stored.



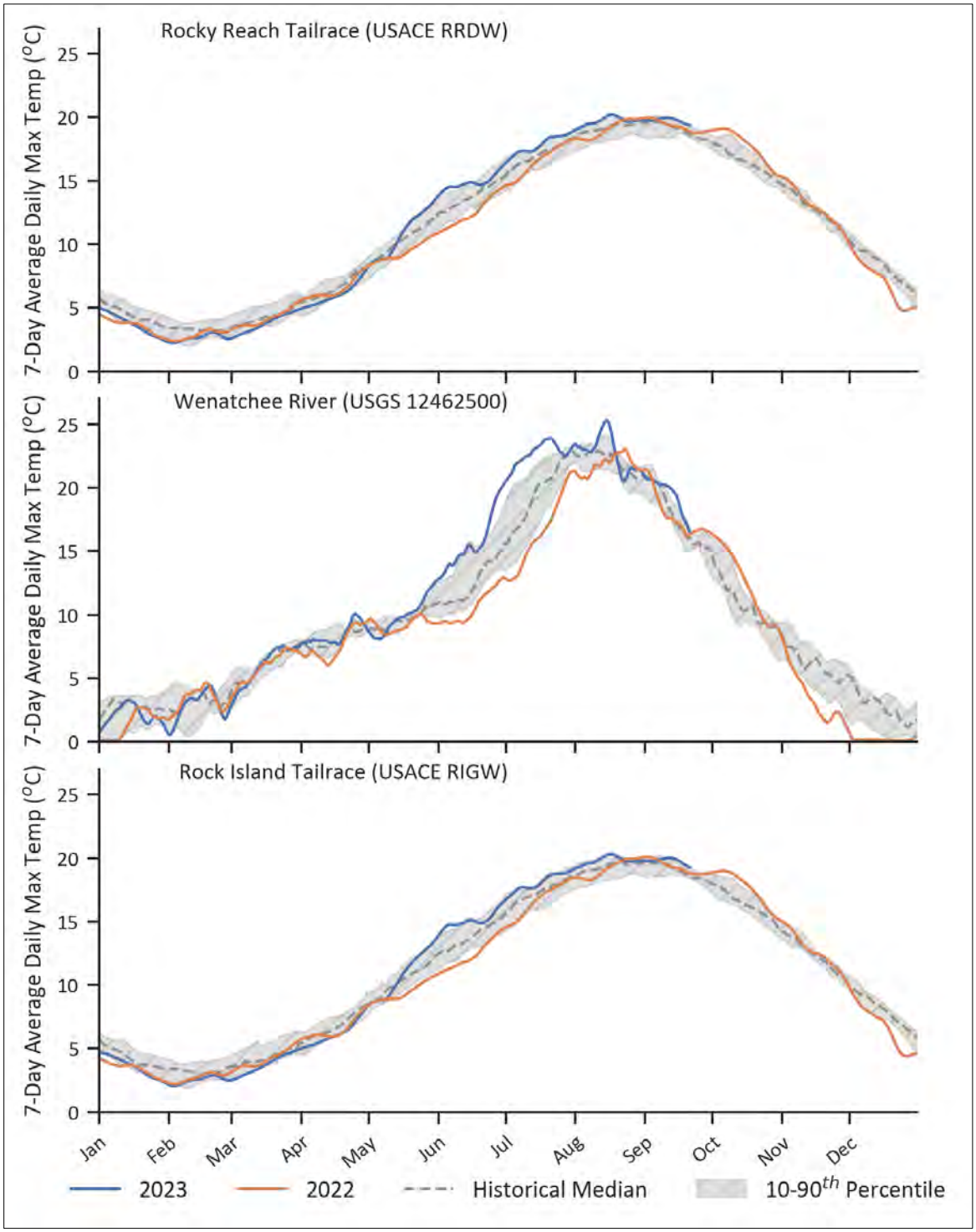
Sources: Rocky Reach and Rock Island – DART; Wenatchee River – USGS

Figure 5-5 Average Daily Flows at Rocky Reach Tailrace, Wenatchee River at Monitor and Rock Island Tailrace in 2022 and 2023 Compared to 25-Year Historical Record (1998-2022)

5.1.3 Water Temperature

The 7DADM water temperatures for the inflows and outflows to the Rock Island Project are shown in Figure 5-6. The 7DADM water temperature in the lower Wenatchee River was below the 10th percentile of the 7DADM from 2016-2022. In 2022, the 7DADM water temperature in the mainstem Columbia River at both Rocky Reach and Rock Island dams largely remained below the 10th percentile into August, except for a short period in July when it approached the 25-year historical median. The below-average water temperatures in early summer corresponded with historically high flows during this period. The mainstem Columbia and Wenatchee river temperatures in the summer were within the historical 10th and 90th percentiles, but late September and October temperatures were warmer than the 90th percentiles. In 2023, after relatively low temperatures through mid-March, water temperatures at all three locations were at or above the 90th percentile for most of the summer, with particularly high temperatures in the Wenatchee River between July and August. The higher water temperatures in the summer of 2023 corresponded to the higher air temperatures in the Wenatchee area (Figure 5-2) and the lower flows in the Columbia and Wenatchee rivers (Figure 5-4).

At all three locations, the Washington State numeric temperature criterion for salmonid spawning, rearing, and migration of 17.5°C (63.5°F) as a 7DADM was exceeded from late summer to early fall in both years, with higher temperatures in 2023 beginning earlier and extending over a longer interval between locations. In 2022, all three locations began to exceed the criterion between July 21-23; in 2023, it was exceeded on June 24 in the Wenatchee River, July 15 at Rocky Reach, and July 6 at Rock Island. In 2022, the exceedances at the mouth of the Wenatchee River ended by September 18, which is earlier than when the exceedances ended at Rock Island (October 17) and Rocky Reach dams (October 18). In 2023, the 7DADM for the Wenatchee River dropped below the numeric criterion on September 19 but, as of September 20, had not yet dropped below the criterion on the mainstem (at the time of this report, data were only available through September 21 in the Wenatchee River and September 20 on the mainstem Columbia River). On the mainstem Columbia River, these exceedances originated upstream and continued through the Rock Island Project. These exceedances over the numerical criterion are being addressed through temperature Total Maximum Daily Loads (TMDLs) in both the Wenatchee River and the mainstem Columbia River (Schneider and Anderson 2007; USEPA 2021).



Note: Historical period of record for Rocky Reach and Rock Island is 25 years (1999-2022); period of record for Wenatchee River is eight years (2016-2023). The Washington State numeric temperature criterion at all three locations is 17.5°C 7DADM.

Figure 5-6 7DADM Water Temperature at Rocky Reach Tailrace, Wenatchee River, and Rock Island Tailrace Between January 1, 2022, and September 18, 2023, Compared to Historical Record

5.2 Water Quality Results

All field and laboratory data were validated using the procedures described in the QAPP (Study Plan Appendix A [Four Peaks 2022]). Appendix A provides a summary of the data validation results and identifies data qualifiers, where applicable. Results of the validated data are discussed below.

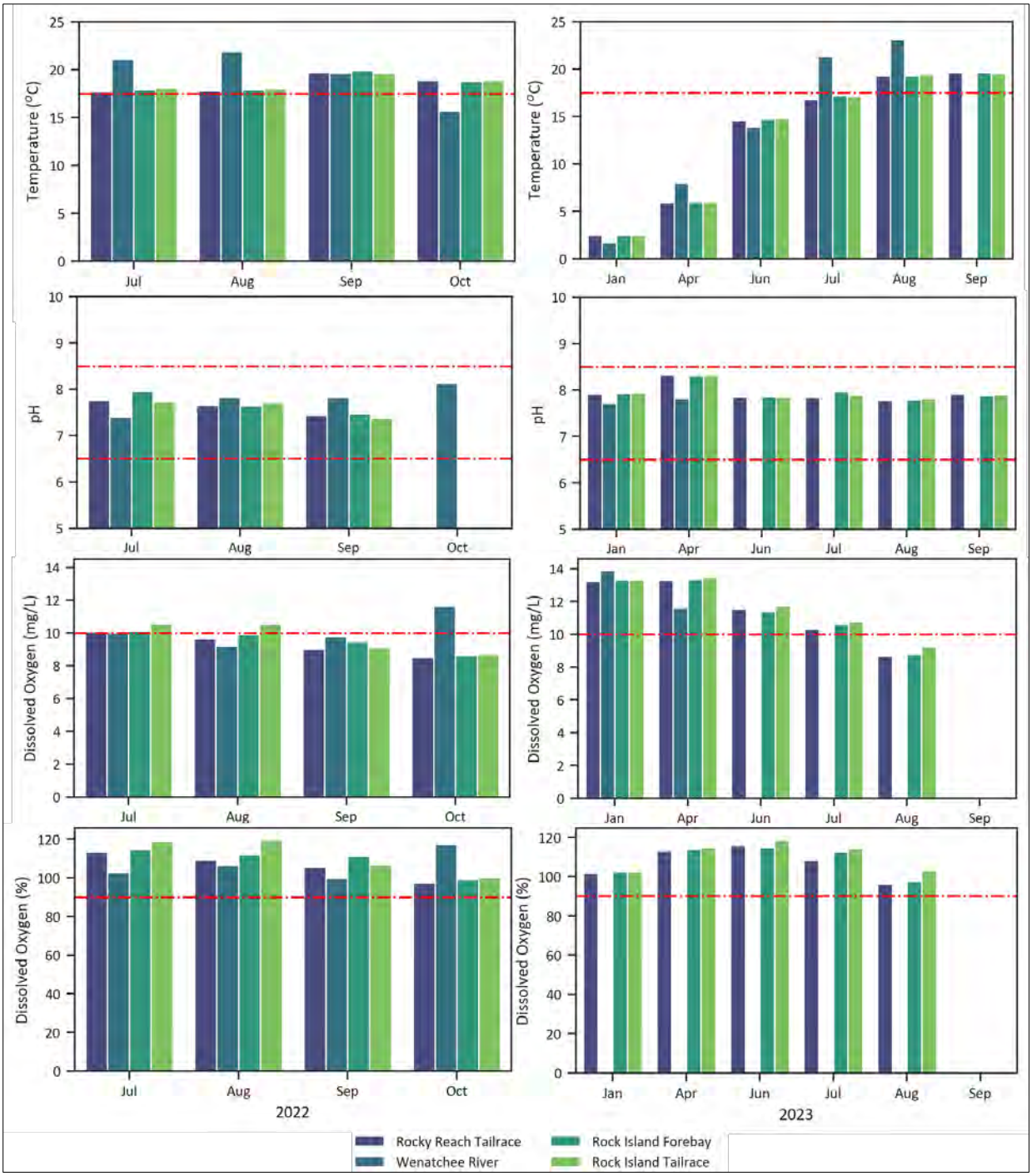
5.2.1 In Situ Measurements

Across all sites, variation in temperature was greater among sampling events than among sites during the same sampling event (Figure 5-7)[3]. Variations in the mainstem Columbia River pH and DO were very minor; however, the Wenatchee River data showed larger fluctuations. Overall, the temperature values exceeded 17.5°C (63.5°F) during all sampling events in 2022 and in August and September of 2023, but it must be noted that these are point measurements, and the 17.5°C numerical criterion is for the 7DADM. As discussed in Section 5.1.1, the higher summer water temperatures in the Rock Island Project largely originate upstream and are being addressed through the Columbia River temperature TMDL (USEPA 2021).

As with temperature, pH was also largely comparable among the mainstem locations and consistently fell within the 6.5 to 8.5 numeric criteria at all locations, except for a single reading of 8.57 at 13.2 ft (4 m) in the Rock Island forebay during the April 2023 sampling event. In 2022, DO concentrations in the mainstem locations were frequently below the 10 mg/L criterion for daily minimum DO[4] during the summer and fall; in 2023, concentrations did not drop below 10 mg/L at any location until August. However, all locations were above the alternative 90 percent DO saturation criterion on all sampling dates in both years, indicating the potential effects of water temperature and barometric pressure on water column DO. Since the DO measurements are instantaneous, the comparison is intended to illustrate the seasonal DO regime relative to numeric criteria and is not intended to be a determination of whether the criteria are always met within the day.

[3] Mainstem pH samples from October are not shown because the pH measurements did not meet the quality control criteria because of a pH sensor malfunction. Wenatchee River data were collected at the Wenatchee long-term EIM station (45A070). October DO (mg/L) concentrations in the Wenatchee River represent average October values from the period of record. DO percent saturation values for all locations were calculated from recorded DO concentrations, temperature measurements, and elevation-corrected barometric pressure recorded at Pangborn Memorial Airport. Wenatchee River temperature values represent the daily maximum value recorded at USGS gage at Monitor on the day that in situ temperature measurements were recorded at Columbia River sites.

[4] Washington State adopted revised DO criteria in March 2022, which for a waterbody designated as salmonid spawning, rearing and migration are a water column DO of either 10 mg/L or 90 percent saturation. These criteria are yet to be approved by the United States Environmental Protection Agency. The older DO criterion for salmonid spawning, rearing and migration is 8.0 mg/L, which was met on all dates and locations.



Note: Applicable water quality criteria are shown as dashed redlines. Temperature criterion is a 7-day average of the daily maximum; DO criterion is a daily minimum concentration or a daily minimum of the percent DO saturation; pH criteria lines show the maximum and minimum pH limits.

Figure 5-7 Surface (1 m) In Situ Measurements of Temperature, pH, and Dissolved Oxygen

Vertical profiles of temperature, pH, and DO concentrations show that the Rock Island forebay was fully mixed during all sampling events (Figure 5-8).

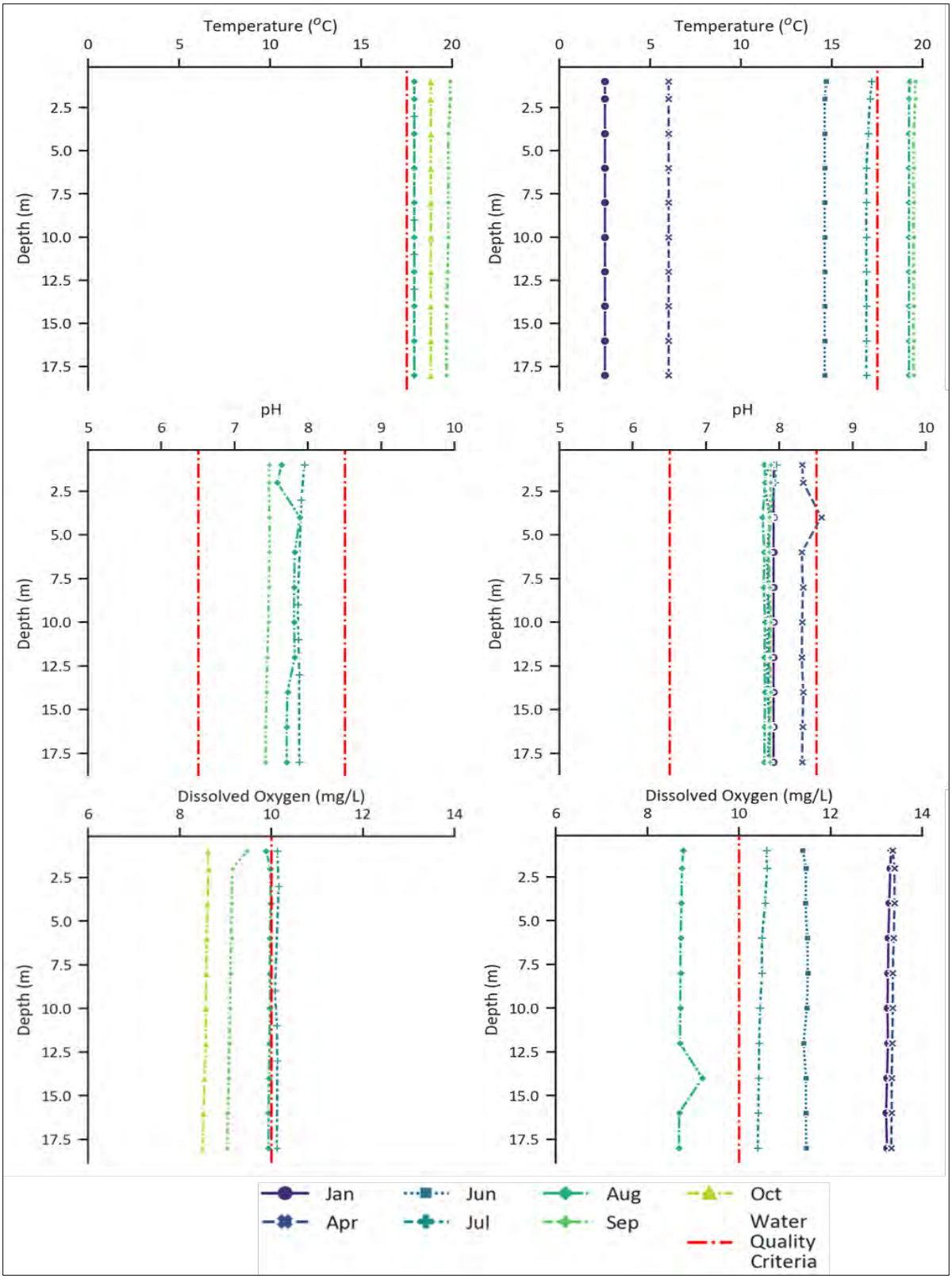
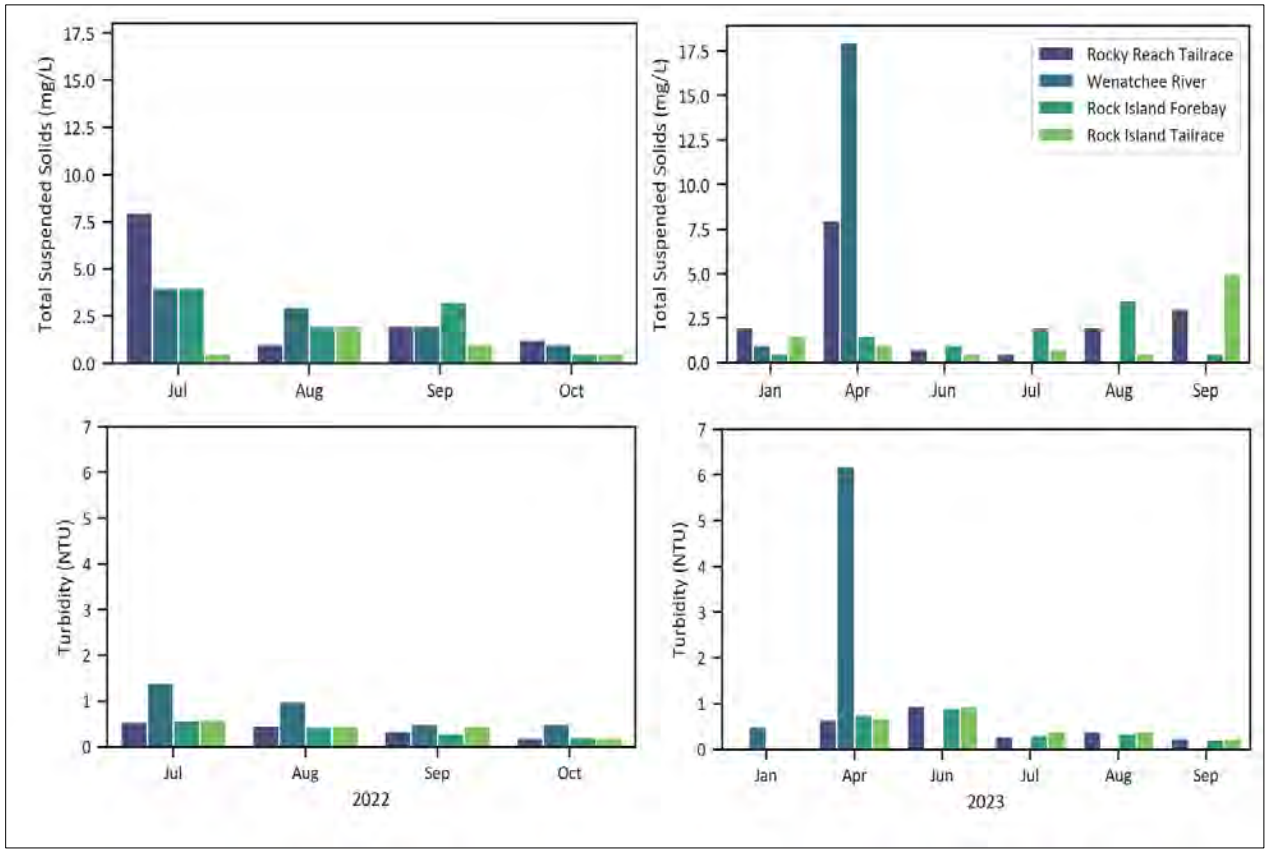


Figure 5-8 Temperature, pH, and Dissolved Oxygen Profiles in the Rock Island Forebay in 2022 (left) and 2023 (right)

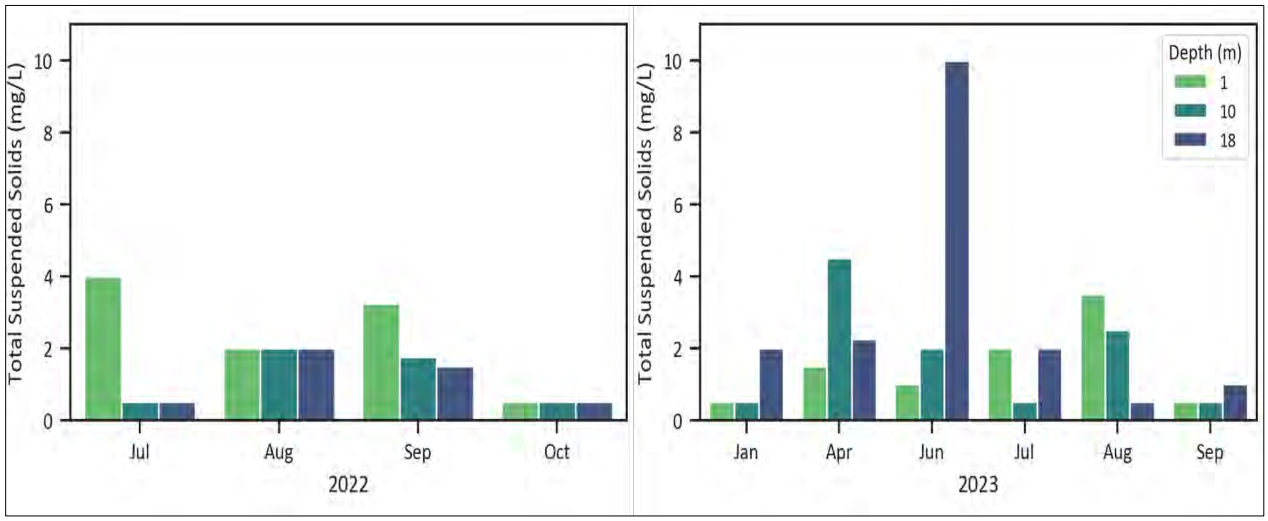
5.2.2 Total Suspended Solids and Turbidity

The TSS and turbidity levels were generally higher in the Wenatchee River than the mainstem Columbia River and remained low throughout the summer, reaching their highest levels during periods of high flows (Figure 5-9). The highest concentrations of TSS (4-8 mg/L) in 2022 were recorded in Rock Island Project inflows in late July, which coincided with high flows at that time (above 144 kcfs at Rocky Reach and 3.9 kcfs at the mouth of the Wenatchee River). In contrast, the highest 2023 TSS concentrations were recorded in the Rocky Reach tailrace in April, followed by September in the Rock Island tailrace. Turbidity values were low and relatively consistent at each site across the study period, with the highest turbidity values recorded at the Wenatchee River EIM station during each sampling event (ranging from 0.5-1.4 nephelometric turbidity units [NTU] compared to 0.19-0.59 at the Columbia River sites). All turbidity values within the Rock Island Project locations (Rocky Reach tailrace, Rock Island forebay and Rock Island tailrace) were less than 5 NTUs, consistent with the applicable water quality standard, which allows an increase of 5 NTUs above background. In the Rock Island forebay, TSS values were highest at depth during the high flows of June of 2023 and were not detected at any depth in October of 2022 (Figure 5-10). Turbidity remained consistent throughout the water column in the forebay on all measured dates, varying slightly across sampling events and only exceeding 1.0 NTU during the high flows in June of 2023 (Figure 5-11).



Note: Values were not available at the Wenatchee EIM station (45A070) after April 2023. The practical quantitation limit (PQL) for TSS is 1 mg/L. Samples reported to be non-detect at the PQL are shown at half the PQL.

Figure 5-9 Surface (1 m) Measurements of Total Suspended Solids and Turbidity



Note: The PQL for TSS is 1 mg/L. Samples reported to be non-detect at the PQL are shown at half the PQL.

Figure 5-10 Total Suspended Solids Measured at 1, 10, and 18 m in the Rock Island Forebay

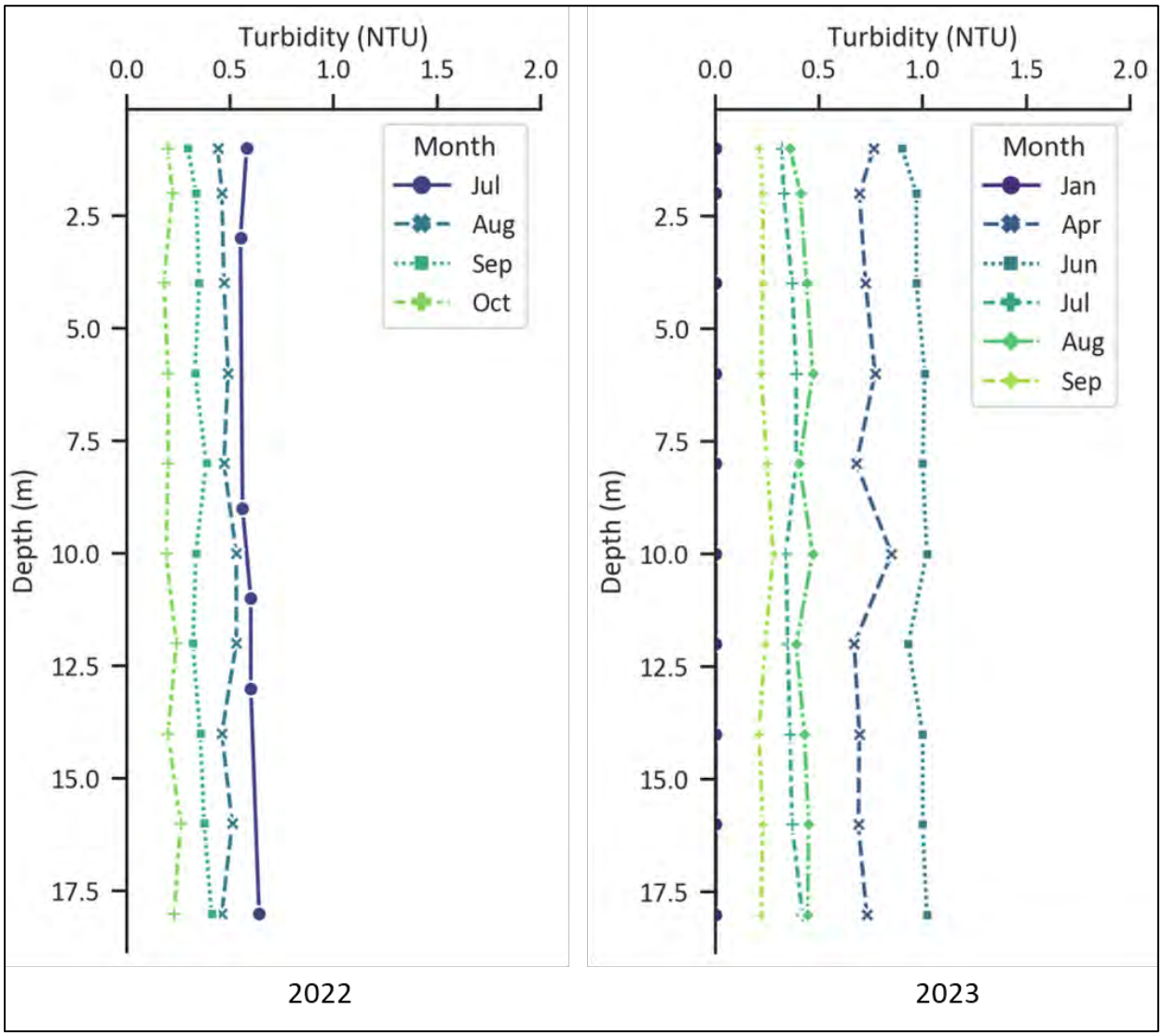
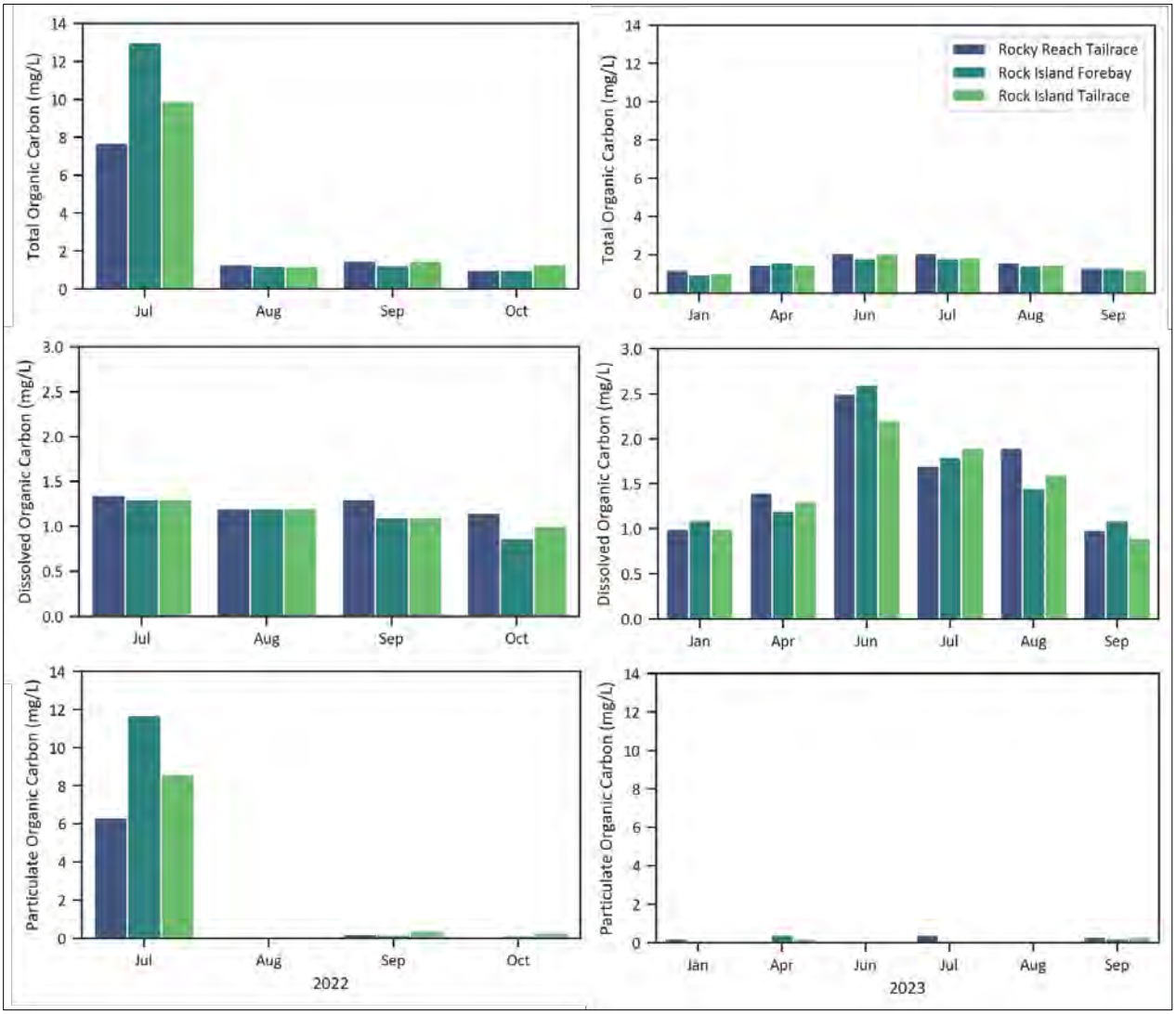


Figure 5-11 Rock Island Forebay In Situ Turbidity Profile

5.2.3 Organic Carbon

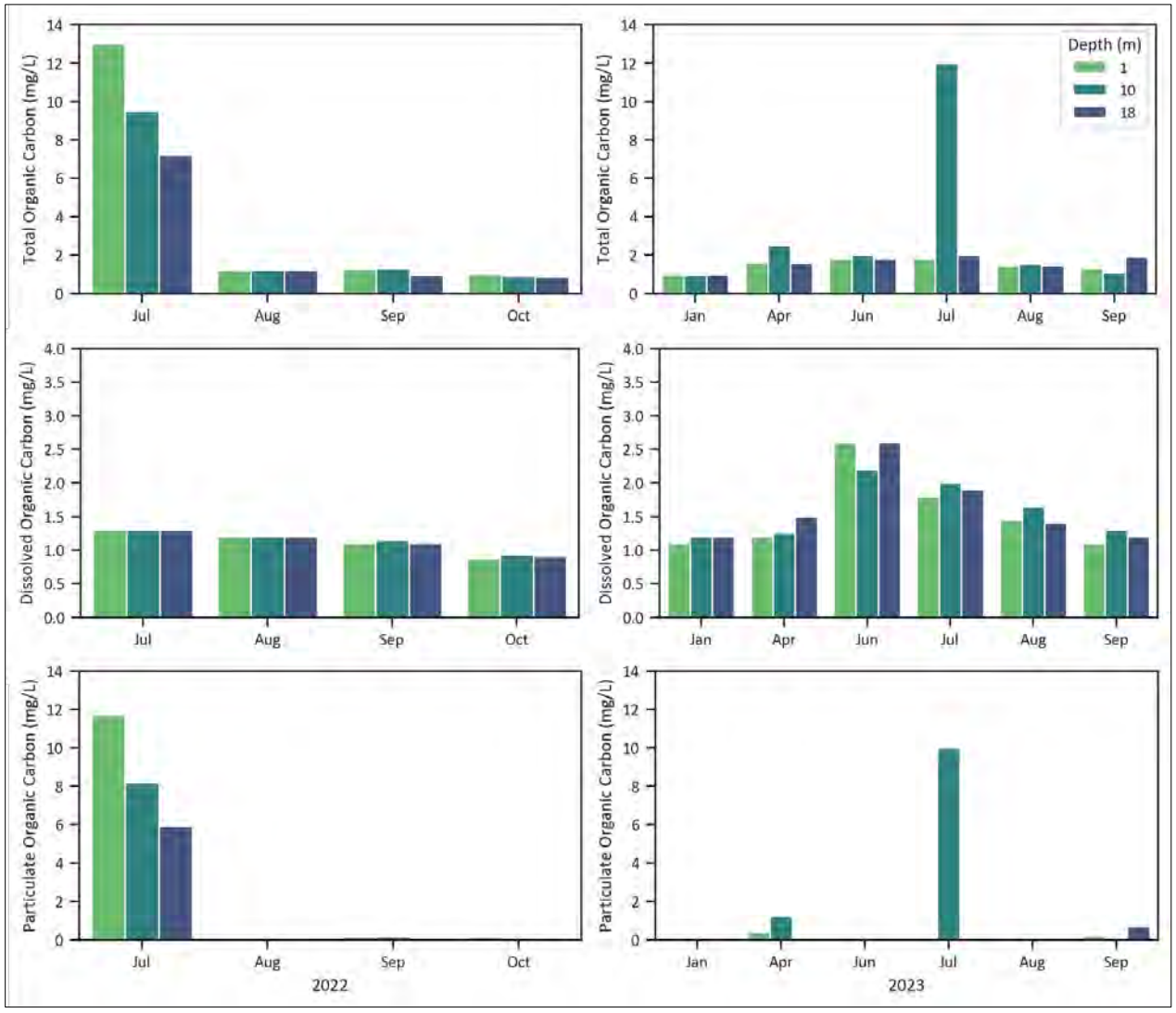
Total organic carbon (TOC) concentrations were highest in late July 2022 (7.7-13 mg/L) at all sampling locations in the mainstem Columbia River (Figure 5-12), which, like TSS, coincided with the high flows in early summer that year. Furthermore, dissolved organic carbon (DOC) concentrations in July were all below 1.4 mg/L, which indicates that most of the higher TOC associated with the higher flows in July was particulate (note that particulate organic carbon [POC] is estimated as the difference between TOC and DOC). During the low flow period from August to October 2022 and throughout 2023, organic carbon was primarily in the dissolved form and concentrations were consistently low (below 2.5 mg/L) across the study period and locations. In the Rock Island forebay, POC concentrations were highest at the surface and decreased with depth

during the July 2022 event, which is also consistent with the TSS measurements (Figure 5-13). However, in 2023 POC concentrations were more variable and did not exhibit a consistent trend relative to TSS. Organic carbon has not been measured at the Wenatchee Ecology station since 2019.



Notes: Organic carbon data have not been collected at the Wenatchee EIM station (45A070) since 2019. The PQL for TOC and DOC were 0.2 and 0.5 mg/L, respectively. Samples reported as non-detect at the PQL are shown at half the PQL. POC was calculated TOC-DOC.

Figure 5-12 Surface Concentrations of Total, Dissolved, and Particulate Organic Carbon



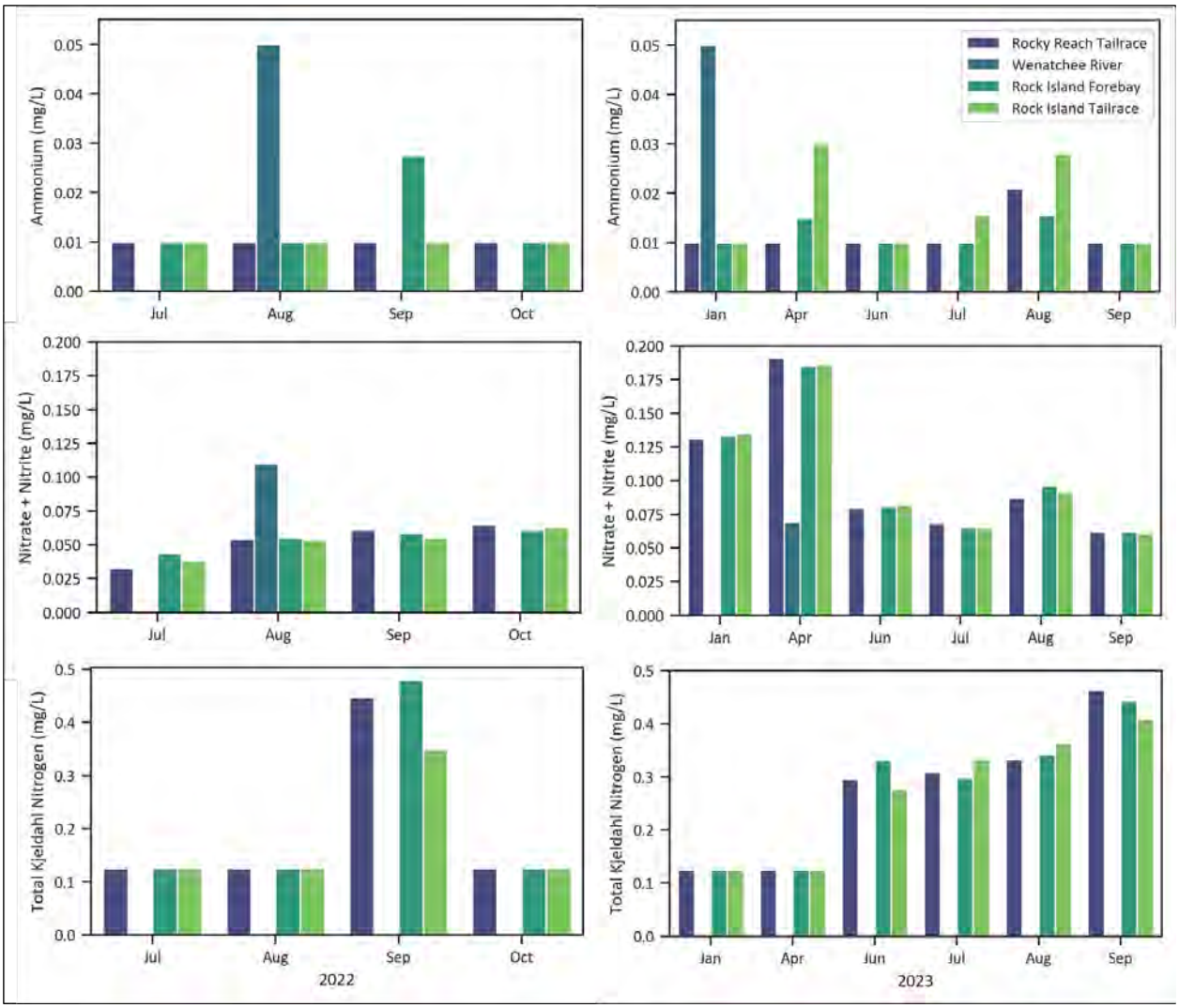
Notes: The PQL for TOC and DOC are 0.2 mg/L and 0.5 mg/L, respectively. Samples reported as non-detect at the PQL are shown at half the PQL. POC was calculated as TOC – DOC.

Figure 5-13 Depth Profiles of Organic Carbon Concentrations Measured at 1, 10, and 18 m in the Rock Island Forebay

5.2.4 Nutrients and Chlorophyll *a*

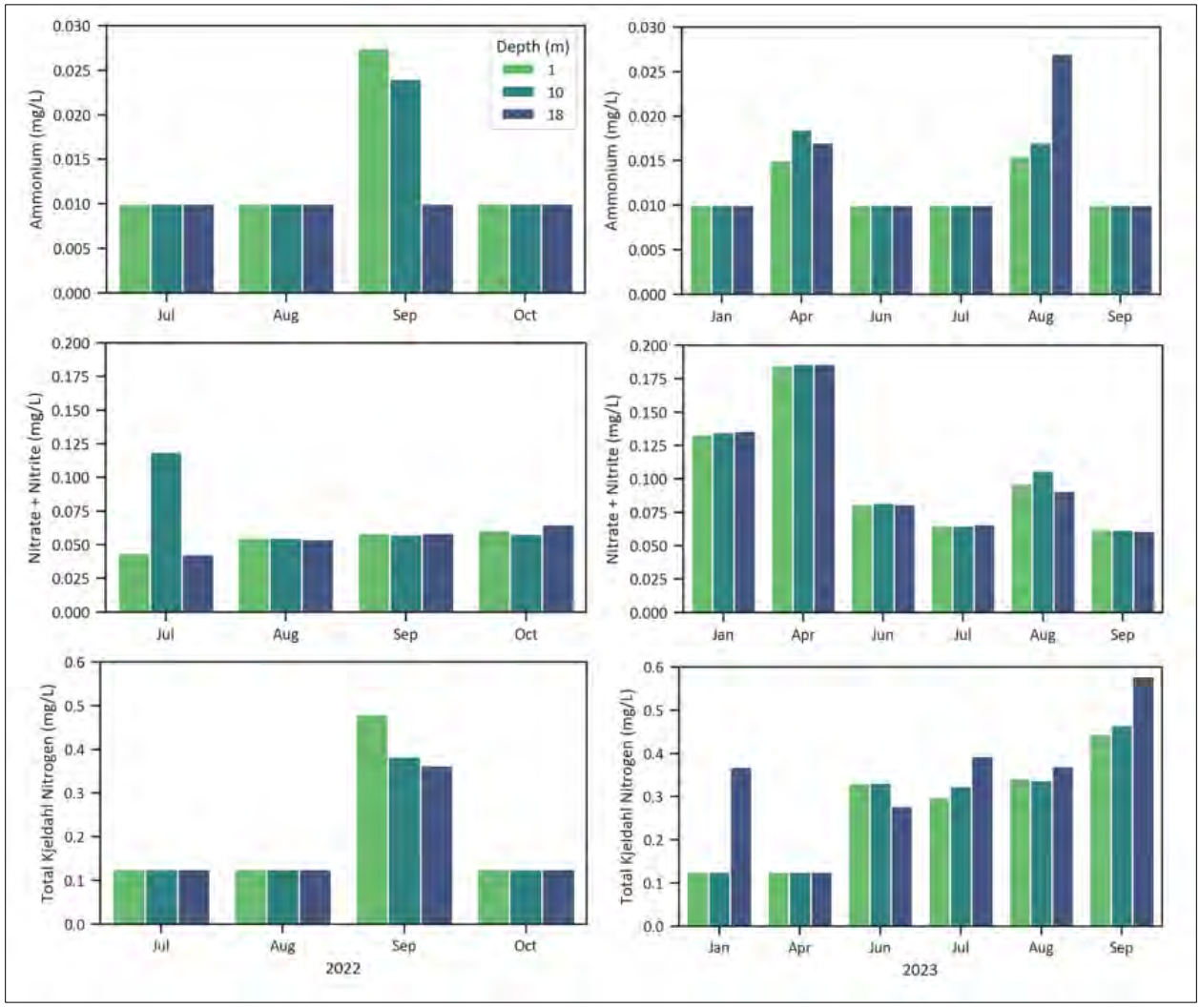
Nutrient and chlorophyll *a* measurements from this study were evaluated alongside the corresponding measurements from the mouth of the Wenatchee River, which were available through April 2023. Nitrogen concentrations were generally low across the study period at all sampling locations (Figure 5-14). In the mainstem Columbia River locations, total Kjeldahl nitrogen (TKN) and ammonium (NH_4) were only detected in September of 2022. In 2023, NH_4 was detected in both the spring and summer while TKN was detected at all locations from June onwards. On average, nitrite plus nitrate (NO_x) concentrations recorded in the Wenatchee River were higher than those recorded during the 2022 sampling events in the mainstem Columbia. NO_x levels in

winter and spring of 2023 were significantly higher than those recorded in 2022 and remained equal to or slightly higher than 2022 values during the summer and into the fall (note that the only available data for the Wenatchee at the time of this report were in August 2022 and April 2023). In both 2022 and 2023, patterns of nitrogen concentrations in the Rock Island forebay were similar to those at the surface, except for a peak in NO_x at 32.8 ft (10 m) in July 2022 (Figure 5-15).



Note: The PQL for NH4, NOx, and TKN are 0.02 mg/L, 0.02 mg/L, and 0.25 mg/L, respectively. Samples reported as non-detect at the PQL are shown at half the PQL.

Figure 5-14 Surface Concentrations of Ammonium, Nitrate Plus Nitrite, and Total Kjeldahl Nitrogen

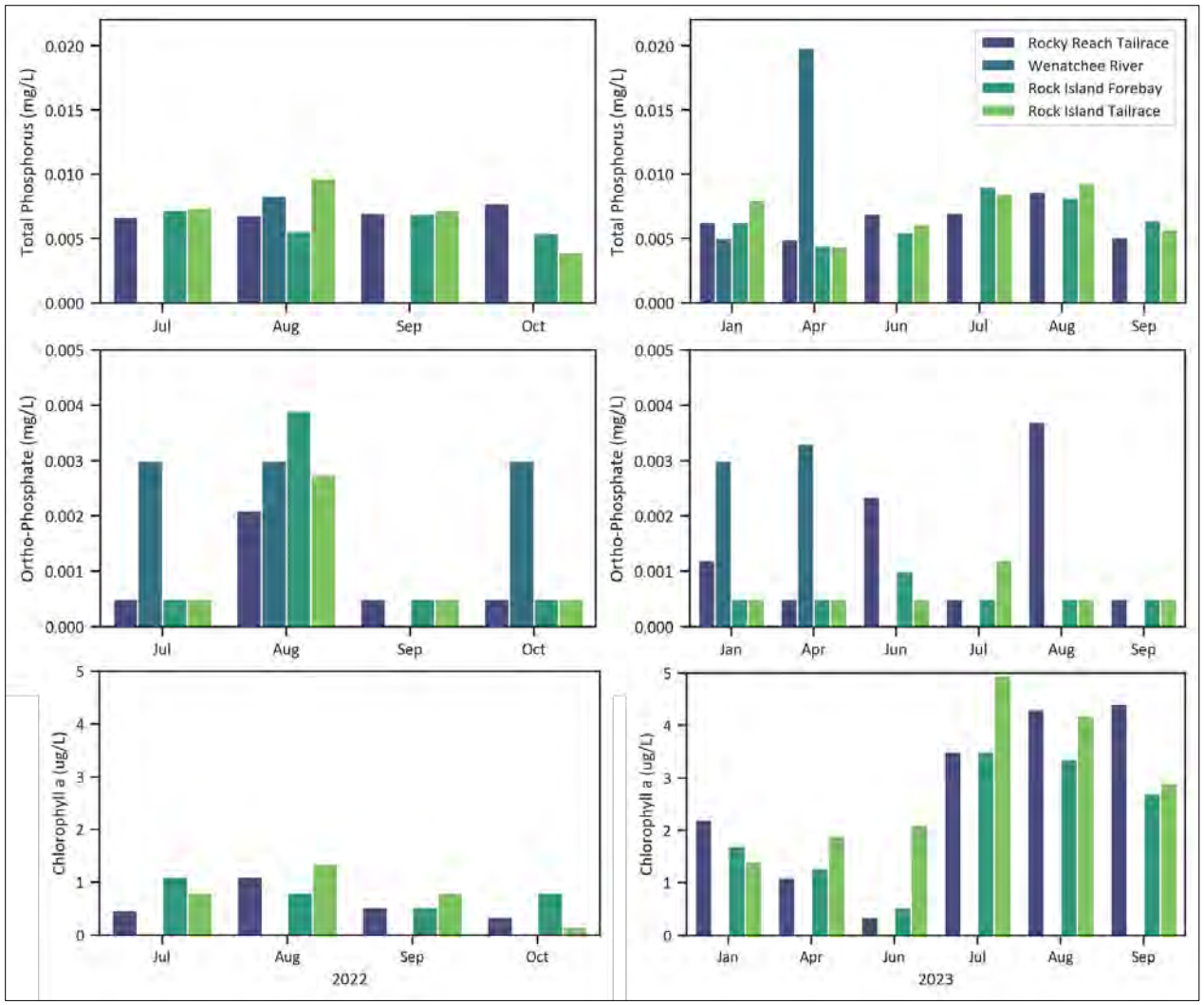


Note: The PQL for NH_4, NOx, and TKN are 0.02 mg/L, 0.02 mg/L, and 0.25 mg/L, respectively. Samples reported as non-detect at the PQL are shown at half the PQL.

Figure 5-15 Ammonium, Nitrate Plus Nitrite, and Total Kjeldahl Nitrogen Measured at 1, 10, and 18 m Depths in the Rock Island Forebay

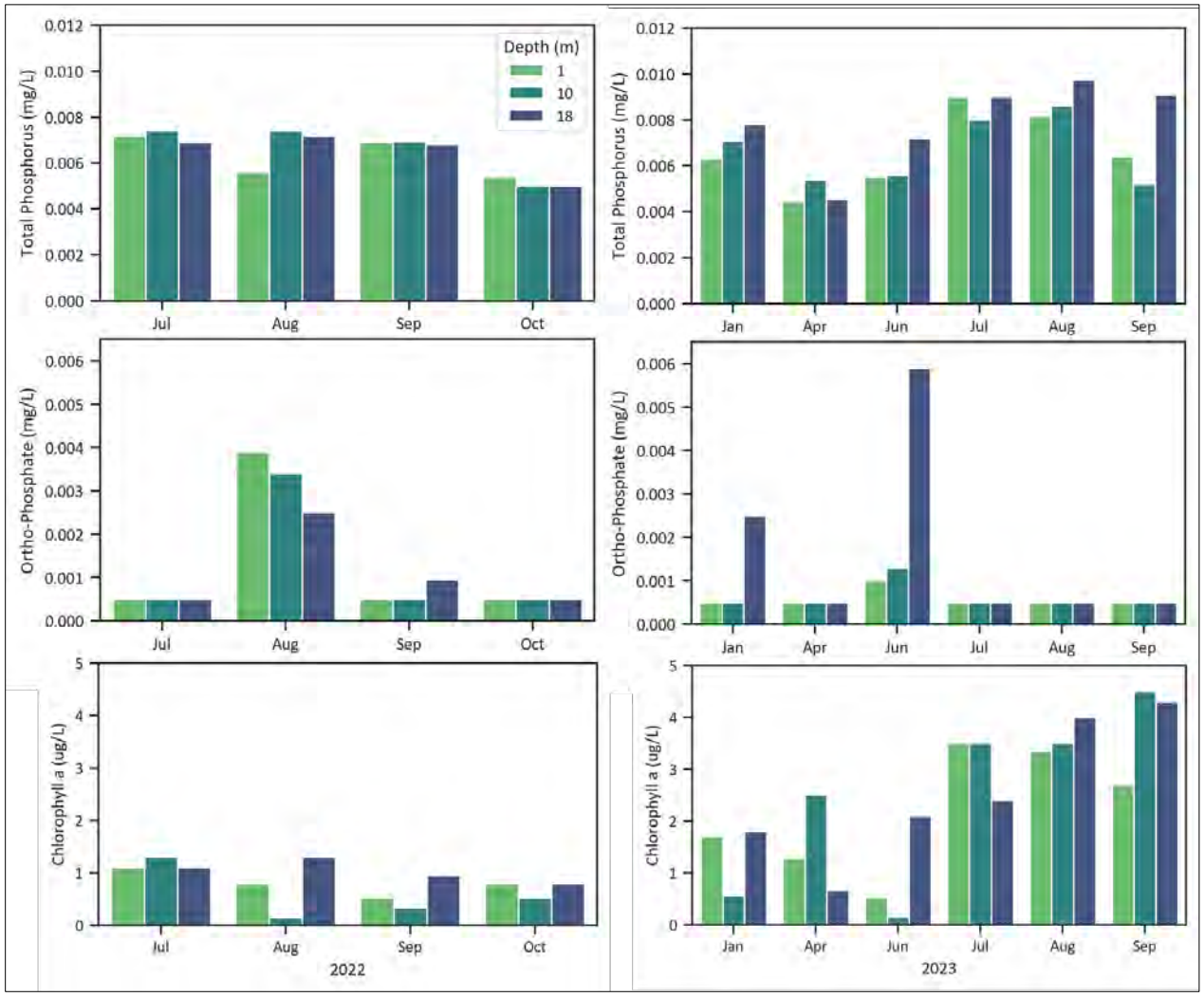
Similar to nitrogen, phosphorus concentrations were also very low across the study period. Across sampling locations in the mainstem Columbia River, orthophosphate (OP) was only detected in August 2022 across all locations (0.002-0.004 mg/L), and most frequently in the Rocky Reach tailrace in 2023 (0.001-0.004 mg/L (Figure 5-16). Where OP data were available for the Wenatchee River, OP concentrations were significantly higher than where they were detected at the surface in the mainstem Columbia River. The highest concentration of OP during the study was at 18 m (59 ft)) in the Rock Island forebay in June of 2023. TP was more variable across sites and sampling events, but generally remained below 10 microgram/liter (ug/L). The forebay samples did not show an appreciable gradient in OP or TP (Figure 5-17), which not only indicates the well-mixed

nature of the water column but also reflects the well-oxygenated conditions extending vertically along the forebay (high DO conditions typically limit phosphorus fluxes from sediments).



Note: Chlorophyll *a* data not available for Wenatchee River. Wenatchee OP data for July and August were available for 2022; all other OP and TP data are averages of data previously collected during those months between 2000-2021 for OP and 2007-2021 for TP. The PQL for TP and OP is 0.003 mg/L, and for chlorophyll *a* is 0.3 ug/L. Samples reported as non-detect at the PQL are shown at half the PQL.

Figure 5-16 Surface Concentrations (1 m) of Total Phosphorus, Orthophosphate, and Chlorophyll *a*



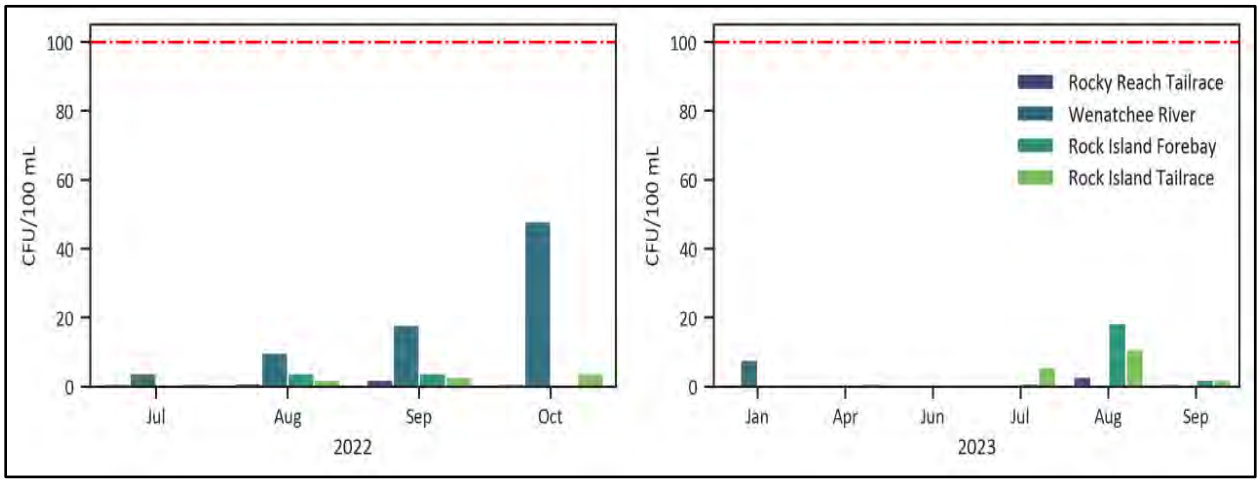
Note: The PQL for TP and OP is 0.003 mg/L, and for chlorophyll *a* is 0.3 ug/L. Samples reported as non-detect at the PQL are shown at half the PQL.

Figure 5-17 Total Phosphorus, Orthophosphate, and Chlorophyll a Concentrations Measured at 1, 10, and 18 m Depths in the Rock Island Forebay

Chlorophyll *a* concentrations were generally low at about 5 ug/L or less (Figure 5-15). At the surface, chlorophyll *a* was highest overall between July and September 2023, with the highest levels recorded in the Rock Island tailrace that July. Within the Rock Island forebay, chlorophyll *a* levels were variable vertically and seasonally, with summer 2023 levels generally higher than summer 2022 levels. Chlorophyll *a* detections were observed throughout the water column. Generally, the photic zone would not be expected to extend down to the turbine intake. The detections at the lower depths potentially indicate the downward flow towards the turbine, causing upstream chlorophyll *a* to move downwards and/or settling of phytoplankton within the forebay (Figure 5-17).

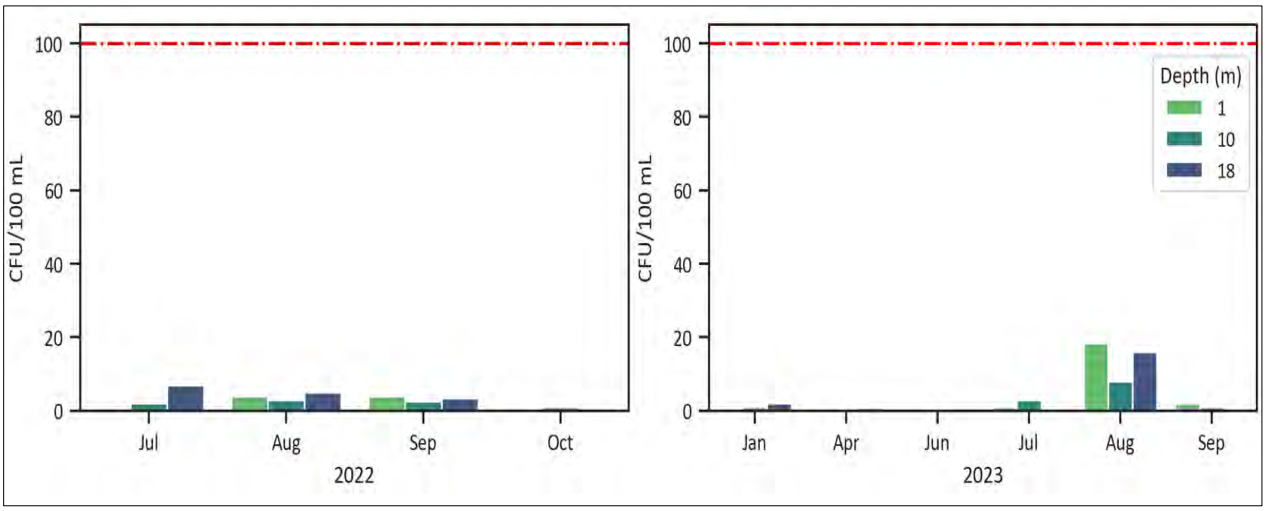
5.2.5 E. Coli

E. coli concentrations were mostly low across the study period within the study locations. A maximum of 48 colony forming units (CFU)/100 mL was reported at the mouth of the Wenatchee River in October 2022 (Figure 5-18). Values in the mainstem Columbia River only exceeded 10 CFU/100 mL in August of 2023 in the Rock Island forebay and tailrace during the sampling period, with the highest concentration at the surface (3.3 ft [1 m]) in the Rock Island forebay (20.0 CFU/100 mL). Within the Rock Island forebay, *E. coli* concentrations varied somewhat by depth, but variation between sampling events was greater than across depths (Figure 5-19).



Note: *E. coli* concentrations in the Wenatchee River were not yet reported after April 2023. The Washington State recreational use *E. coli* numeric criterion is a geometric mean of 100 CFU/100 mL or less (dash-dotted red line in figure).

Figure 5-18 Surface Concentrations (1 m) of *E. coli*



Note: The Washington State recreational use *E. coli* numeric criterion is a geometric mean of 100 CFU/100 mL or less (dash-dotted red line in figure).

Figure 5-19 *E. coli* Concentrations Measured at 1, 10, and 18 m Depths in the Rock Island Forebay

5.3 Periphyton Results

Periphyton chlorophyll *a* concentrations varied substantially between seasons, with the lowest concentrations recorded at both sites in summer 2022 and the highest overall concentration recorded in the Rocky Reach tailrace in spring 2023 (Table 5-1). While overall AFDM was comparable between sites during both summers, AFDM was substantially higher in the Rock Island tailrace in the fall and winter. By contrast, in spring 2023 AFDM was higher in the Rocky Reach tailrace. Much higher values of AFDM were recorded in February 2023 than at any other time; these may have been due to a very high sediment load in the algal mat during that time. When AFDM values between sites were similar, chlorophyll *a* concentrations tended also to be within the same order of magnitude between sites; when they were significantly different, chlorophyll *a* concentrations also tended to differ substantially but in the opposite direction.

Table 5-1 Periphyton Chlorophyll *a* and Ash-Free Dry Mass

YEAR	EVENT	LOCATION	ASH-FREE DRY MASS (g/m^2)	PERIPHYTON CHLOROPHYLL *a* (mg/m^2)
2022	Summer	Rocky Reach tailrace	32.1	94.6
		Rock Island tailrace	25.9	89.0
	Fall	Rocky Reach tailrace	34.0	2,003.6
		Rock Island tailrace	66.6	1,290.8
2023	Winter	Rocky Reach tailrace	28.9	n/a
		Rock Island tailrace	66.3	n/a
		Rocky Reach tailrace	350.5	1,546.2
		Rock Island tailrace	997.6	799.9
	Spring	Rocky Reach tailrace	70.5	22,119.8
		Rock Island tailrace	44.9	1,882.1
	Summer	Rocky Reach tailrace	32.0	579.6
		Rock Island tailrace	30.2	946.3

Diatoms were the dominant group in both the Rocky Reach and Rock Island tailraces, comprising 73.6 percent and 100 percent of the respective periphyton communities in 2022 and 84.7 percent and 89.7 percent in 2023 (Table 5-2). Of the 11 genera identified at each site in 2022, seven were the same in both locations; of the 24 genera identified in 2023, 12 were the same. In 2022, *Achnanthidium* spp. were the most dominant genus in both locations by unit, although the genus *Fragilaria* was more numerous in the Rock Island tailrace by cell count. Other dominant genera included *Diatoma* and *Fragilaria* in the Rocky Reach tailrace and *Euontia* in the Rock Island tailrace. In 2023, *Achnanthidium* was the most numerically dominant genus by cell count in the Rocky Reach tailrace but while they were present in the Rock Island tailrace, they were not in the top five most dominant taxa. *Staurosira* was the most dominant genus by cell count in the Rock Island

tailrace and was in the top five in Rocky Reach as well; other dominant taxa in both locations included *Fragilaria* and an unknown filamentous Cyanophyte.

Table 5-2 Periphyton Taxonomic Metrics

YEAR	METRIC	ROCKY REACH TAILRACE	ROCK ISLAND TAILRACE
2022	Total number of divisions	3	1
	Genera richness	11	11
	Diatom percent	73.6	100
2023	Total number of divisions	2	2
	Genera richness	18	24
	Diatom percent	84.9	89.7

Table 5-3 Periphyton Taxonomy

YEAR	SITE	DIVISION	TAXON	SAMPLE PERCENTAGE
2022	Rocky Reach tailrace	Bacillariophyta	*Achnanthidium* spp.	24.3
		Chlorophyta	*Rhizoclonium hieroglyphicum*	15.5
		Bacillariophyta	*Diatoma* spp.	12.2
		Cyanobacteria	*Merismopedia* spp.	10.8
		Bacillariophyta	*Melosira varians*	9.5
	Rock Island tailrace	Bacillariophyta	*Fragilaria* spp.	32.6
		Bacillariophyta	*Eunotia* spp.	21.0
		Bacillariophyta	*Achnanthidium* spp.	14.4
		Bacillariophyta	*Cyclotella* spp.	8.3
		Bacillariophyta	*Melosira varians*	7.2
2023	Rocky Reach tailrace	Bacillariophyta	*Achnanthidium* sp.	37.8
		Cyanophyta	Filamentous Cyanophyte	13.4
		Bacillariophyta	*Encyonema* sp.	9.2
		Bacillariophyta	*Nitzschia* sp.	5.9
		Bacillariophyta	*Staurosira* sp.	5.0
	Rock Island tailrace	Bacillariophyta	*Staurosira* sp.	60.3
		Cyanophyta	Filamentous Cyanophyte	10.3
		Bacillariophyta	*Fragilaria* sp.	4.4
		Bacillariophyta	*Nitzschia* sp.	3.4
		Bacillariophyta	*Pseudostaurosira* sp.	3.4

5.4 Zooplankton Results

The three major zooplankton taxa documented were cladocerans, copepods, and rotifers. Cladocerans (including genera *Daphnia* and *Bosmina*) and copepods (including suborders Calanoida and Cyclopoida) are filter-feeding crustacean zooplankton. Planktonic rotifers are also

primarily filter feeders, and as a group, they are relatively small-bodied and were likely under-represented in the samples due to the mesh size used. However, larger rotifers were collected, including *Kellicottia longispina* and two species of *Polyarthra. Kellicottia longispina* was one of the dominant taxa at all sampling locations except during fall of 2022 when all locations were dominated by immature copepods.

Zooplankton density, richness, and diversity were higher across all sites in the summer than in the fall. Zooplankton abundance was highest in the Rocky Reach tailrace in both summer and fall, while species richness and diversity were similar across sites within sampling events (Table 5-4). Taxa richness (both taxa count and Margalef's) and evenness were slightly higher in the Rock Island forebay in the summer and in the Rocky Reach tailrace in the fall, and overall species diversity was comparable between the locations. In the fall, zooplankton assemblages shifted from more even distributions to being dominated by copepodite life stages.

Table 5-4 Density, Richness, and Diversity Metrics for Zooplankton Assemblages

METRIC	SAMPLING EVENT	ROCKY REACH TAILRACE	ROCK ISLAND FOREBAY	ROCK ISLAND TAILRACE
Density (abundance per L)	Summer 2022	1.5	1.3	1.0
	Fall 2022	0.8	0.4	0.4
	Winter 2023	0.7	1.1	1.2
	Spring 2023	1.5	2.7	1.2
	Summer 2023	0.9	1.6	1.5
Species richness	Summer 2022	18	20	18
	Fall 2022	9	7	7
	Winter 2023	12	12	12
	Spring 2023	19	17	13
	Summer 2023	14	18	15
Margalef's richness	Summer 2022	3.81	4.26	4.17
	Fall 2022	1.98	1.89	1.89
	Winter 2023	2.91	2.65	2.57
	Spring 2023	3.55	2.86	2.50
	Summer 2023	2.80	3.37	2.79
Shannon diversity index	Summer 2022	2.49	2.49	2.42
	Fall 2022	1.47	1.47	1.39
	Winter 2023	2.03	1.56	1.83
	Spring 2023	1.86	1.52	1.36
	Summer 2023	2.02	2.07	2.04
Pielou's Evenness Index	Summer 2022	0.86	0.84	0.84
	Fall 2022	0.69	0.75	0.71
	Winter 2023	0.82	0.63	0.74
	Spring 2023	0.63	0.54	0.53
	Summer 2023	0.78	0.71	0.75

METRIC	SAMPLING EVENT	ROCKY REACH TAILRACE	ROCK ISLAND FOREBAY	ROCK ISLAND TAILRACE
Simpson's Heterogeneity	Summer 2022	0.90	0.89	0.89
	Fall 2022	0.70	0.73	0.70
	Winter 2023	0.82	0.65	0.77
	Spring 2023	0.76	0.66	0.59
	Summer 2023	0.81	0.80	0.81

The dominant taxa were similar across all locations (Table 5-5). *Bosmina longirostris* and *Kellicottia longispina* together comprised approximately 40 percent of individuals sampled at all three locations in summer 2022 and 50 percent of individuals in summer 2023. Cyclopoid and Calanoid copepodites dominated at all locations in the fall, comprising 75.0-85.7 percent of the individuals sampled, and nearly all of the dominant taxa across all sites were rotifers in the winter and spring of 2023. Unlike 2022, immature copepods were among the dominant taxa in summer of 2023, which may reflect the timing differences in spring and summer conditions between the two years. *Daphnia pulex* was detected at all locations in the summer of 2022 and in the winter, although they were not among the top three dominant taxa at any location. In 2023, *Daphnia* sp. were detected in the spring of 2023 and in the Rocky Reach tailrace in the summer.

Table 5-5 Top Three Dominant Zooplankton Taxa Summary

SAMPLING EVENT	LOCATION	TAXON	SAMPLE PERCENTAGE
Summer 2022	Rocky Reach tailrace	*Bosmina longirostris*	21.8
		Kellicottia longispina	18.4
		Calanoida - copepodites	8.0
	Rock Island forebay	*Kellicottia longispina*	27.9
		Bosmina longirostris	12.3
		Polyarthra remata	7.8
	Rock Island tailrace	*Bosmina longirostris*	22.0
		Kellicottia longispina	18.6
		Cyclopoida - copepodites	13.6
Fall 2022	Rocky Reach tailrace	Cyclopoida - copepodites	47.4
		Calanoida - copepodites	30.5
		Calanoida - nauplii	6.3
	Rock Island forebay	Calanoida - copepodites	41.7
		Cyclopoida - copepodites	33.3
		Chironomidae	8.3
	Rock Island tailrace	Cyclopoida - copepodites	45.8
		Calanoida - copepodites	33.3
		Calanoida - nauplii	4.2
Winter 2023	Rocky Reach tailrace	*Kellicottia longispina*	38.6
		Synchaeta sp.	13.6

SAMPLING EVENT	LOCATION	TAXON	SAMPLE PERCENTAGE
		Polyarthra euryptera	9.1
	Rock Island forebay	*Kellicottia longispina*	57.1
		Synchaeta sp.	14.3
		Polyarthra sp.	7.9
	Rock Island tailrace	*Kellicottia longispina*	37.7
		Synchaeta sp.	24.0
		Cyclopoida - copepodites	4.8
Spring 2023	Rocky Reach tailrace	*Kellicottia longispina*	37.7
		Synchaeta sp.	29.6
		Keratella cochlearis	6.9
	Rock Island forebay	*Kellicottia longispina*	53.9
		Synchaeta sp.	19.1
		Keratella cochlearis	12.0
	Rock Island tailrace	*Kellicottia longispina*	57.7
		Synchaeta sp.	18.5
		Polyarthra sp.	4.4
Summer 2023	Rocky Reach tailrace	*Bosmina longirostris*	27.0
		Kellicottia longispina	19.5
		Cyclopoida - copepodites	17.2
	Rock Island forebay	*Bosmina longirostris*	38.7
		Calanoida - copepodites	16.1
		Kellicottia longispina	12.3
	Rock Island tailrace	*Kellicottia longispina*	37.7
		Bosmina longirostris	13.9
		Cyclopoida - copepodites	12.6

5.5 Trophic Index

Chlorophyll *a* and TP indices did not appear to vary in tandem at any location across the study period. The TP index was consistently highest in the Wenatchee River, and while the average values in both tailraces were the same, the TP index was the most variable in the Rock Island tailrace (Table 5-6). In the forebay, the TP index was consistent across the study period at all three depths, while chlorophyll *a* index values were higher on average at 59 ft (18 m). Both indices were below the mesotrophic index value of 40 (Carlson and Simpson 1996) across sites and the study period. The chlorophyll *a* index values were more variable and generally lower than TP trophic index.

TN to TP ratios were calculated to assess which nutrient might be more limiting (Table 5-7). For the purpose of this analysis, TN was calculated as TKN plus NOx. A typical algal cell stoichiometry has a nitrogen to phosphorous (N:P) ratio (by weight) of 7:1 (Redfield et al. 1963). Higher ratios indicate phosphorus limitation, and lower ratios indicate nitrogen limitation. Table 5-7 shows that

even the minimum TN:TP ratios are consistently higher than seven across all sites, indicating that the system is predominantly phosphorus limited.

Table 5-6 Trophic State Index Summary

LOCATION	CHLOROPHYLL *a* TROPHIC INDEX[1]			TOTAL PHOSPHORUS TROPHIC INDEX[1]		
	MIN.	MAX.	AVG.	MIN.	MAX.	AVG.
Rocky Reach Tailrace	20	45	32	27	35	31
Rock Island forebay (3.3 ft [1 m])	24	43	33	26	36	31
Rock Island forebay (32.8 ft [10 m])	12	45	30	27	35	31
Rock Island forebay (59 ft [18 m])	27	45	35	26	37	32
Rock Island tailrace	12	46	34	24	37	32
Wenatchee River[2]				27	47	37

[1] Index values that reflect the minimum values reported (1/2 the detection limit of the parameters in question): Chlorophyll *a* = 12, TP = 24.
[2] Chlorophyll a data were not available at the Wenatchee River EIM station.

Table 5-7 Nitrogen-to-Phosphorus Ratio Summary

LOCATION	RATIO MINIMUM	RATIO MAXIMUM
Rocky Reach tailrace	16.1	90.9
Rock Island forebay (3.3 ft [1 m])	17.4	69.4
Rock Island forebay (32.8 ft [10 m])	16.9	89.4
Rock Island forebay (59 ft [18 m])	17.4	63.5
Rock Island tailrace	12.9	71.8

6.0 CONCLUSION

6.1 Consistency with Numerical Water Quality Criteria

Throughout the study period, pH and turbidity values recorded in situ consistently met the numeric criteria at all locations, with the exception of a single pH measurement in the Rock Island forebay in 2023. DO concentrations frequently fell below the 10 mg/L criterion. However, DO percent saturation always met the alternative 90 percent numeric criterion in both the Wenatchee River and the mainstem Columbia monitoring locations. *E. coli* levels remained consistently low at all locations, meeting the corresponding numeric criterion. As noted in Section 5.1.1, the temperature excursions during the critical summer period originate upstream and are being addressed through the Columbia River and Wenatchee temperature TMDLs. Based on the observations from the baseline water quality data, the numeric water quality criteria were generally met during the study period, except for temperature.

6.2 Lower Trophic Level Productivity

The low chlorophyll *a* levels across the Rock Island Project sites indicate that pelagic primary production is generally low. Across the study area, the low chlorophyll *a* concentrations likely reflect conditions of phosphorus limitation, as turbidity was consistently very low (i.e., not light limiting), and the nitrogen levels were high relative to phosphorus levels (N:P ratios consistently greater than 10 at all sites and locations). In 2022, OP was only detected in the mainstem Columbia River in August, coinciding with the sampling event that detected the highest concentrations of chlorophyll *a* in both tailraces. In 2023, productivity was generally higher, likely due to the lower flows and warmer temperatures during the summer months relative to 2022.

On average, the TSI of the study area did not vary substantially across sampling locations, with the highest index values (based on TP) measured in the Wenatchee River. Chlorophyll *a*-based metrics exhibited more variability across locations. Within the mainstem locations, the average TSI based on TP and chlorophyll *a* were 33 and 31, respectively. TSI values of 30 or lower are considered oligotrophic, while TSI values between 40 and 50 are considered mesotrophic (Carlson and Simpson 1996). Based on the range of TSI calculated (12-46 for chlorophyll *a* and 24-47 for TP), it is reasonable to infer that the Rock Island pool is oligo-mesotrophic. When the TP-based TSI is higher than the chlorophyll *a*-based TSI, it indicates a system with higher non-algal particulate matter that dominates light extinction rather than internally produced algal organic matter (Carlson and Simpson 1996). Recognizing the relatively wide range in the TSIs for phosphorus and chlorophyll *a*, the organic matter in the Rock Island pool is likely a combination of internal production and external loading.

Periphyton biomass exhibited more variation among sites and seasons than pelagic chlorophyll *a* concentrations, likely due to the higher variability in littoral conditions. Periphyton AFDM varied across seasons, and differences between the two sites also varied among sampling events. Net periphyton biomass is influenced by nutrient concentrations, water velocity, temperature, and light availability (Bothwell 1988). As periphyton colonize natural substrates, samples represent cumulative growth. Continuously inundated substrates that may be subject to scour under higher early summer flows provide more opportunities for recolonization over the late summer and early fall period when the flows are lower (Biggs et al. 1998). This may explain the higher biomass in the Rock Island tailrace in fall and the early spring, and the relatively lower values in the summer. Periphyton communities in both locations were dominated by diatoms, with a proportionally higher amount of filamentous algae present in both locations in 2023.

The zooplankton community composition was similar from upstream to downstream, with considerable turnover in the taxa and life stages present at different times of year. Several of the dominant taxa in the summers, including *Bosmina* spp. and copepods, serve as prey items for salmonid fry and juveniles (Merz 2001; Ladago et al. 2016). *Daphnia pulex*, a preferred prey item for juvenile salmonids (Friesen 2005; Sorel et al. 2016), was present at all locations in the summer of 2022.

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Appendix A Data Validation Summary

A.1 Field Data Validation

Water quality sondes, used for in situ measurements, underwent pre-event calibrations and post-event quality control checks following the manufacturer's protocols (YSI 2017) and the Washington Department of Ecology Standard Operating Procedure (EAP108; Ecology 2019). MQOs were established in the QAPP for temperature, DO, pH, and turbidity (Four Peaks 2022), and they included requirements for bias, precision, and completeness.

If the pre- and post-event calibration checks were within ± 0.2˚C, ± 0.2 mg/L, ± 0.2 (S.U.), and 4.0 NTU for temperature, DO, pH and turbidity, respectively, the bias was considered acceptable for the corresponding parameter indicating that the instrument has not drifted significantly. Most in situ water quality measurements met the bias criteria, except for the pH measurements collected on October 5, 2022, DO collected on August 10, 2023 and September 5, 2023, and temperature data collected on September 5, 2023. The pH measurement checks after the October 5, 2022 sampling event showed a drift of more than 0.4 units due to sensor failure, leading to the rejection of in situ pH measurements on that date. On August 11, 2022, the DO samples were qualified (assigned a "J "qualifier) because barometric pressure was not recorded by the probe, and the elevation-corrected station reading was used. Nevertheless, these values are still usable. The DO measurement checks after the September 5, 2023 sampling event showed a drift of more than 0.4 mg/L, resulting in the rejection of in situ DO measurements on that date. The temperature measurement checks after the September 5, 2023 sampling event showed a drift of 0.3˚C for the room temperature water calibration medium. This was less than the threshold for rejections (0.4˚C), but greater than the threshold for unqualified acceptance (0.2˚C). Therefore, temperature data were qualified as estimated (assigned a J qualifier) for September 5, 2023.

Field duplicate measurements collected during each sampling event were used to calculate RPD to assess the precision of in situ measurements. The MQO for in situ measurements precision is an RPD of 10 percent. All in situ water quality measurements met the precision (RPD) criteria of 10 percent, except for turbidity on September 6, 2022, April 19, 2023, August 8, 2023, and September 5, 2023, which often showed RPDs exceeding 10 percent at different depths between the duplicate samples of the Rock Island forebay, and DO on the August 8, 2023 event. Field samples with RPDs exceeding 10 percent were assigned a "J" qualifier.

Finally, the completeness MQO for water quality in situ measurements is 90 percent, representing the proportion of valid measurements relative to the total number of measurements. All field water quality parameters met the completeness criteria of 90 percent.

A.2 Laboratory Water Quality Data Validation

The evaluations of data quality were based on procedures published in the National Guidelines for Inorganic Data Review (USEPA 2017), Standard Methods for the Examination of Water and Wastewater (Rice et al. 2017), and in method procedures published by the U.S. Environmental Protection Agency's Environmental (USEPA) Monitoring Systems Laboratory. These guidelines provide the methods and criteria for reviewing laboratory quality control information and applying the appropriate data qualifiers to the laboratory data.

The quality control information reviewed included chain-of-custody forms, holding times, reporting limits, blank results, matrix spike/matrix spike duplicates recoveries, standard reference material recoveries, and duplicate precision. Data that did not meet the quality control criteria were qualified as per Table A- 1. In instances where a result was assigned a validation qualifier for two or more reasons (e.g., flagged for blank contamination and holding time exceedance), the qualifier with higher precedence was retained.

Table A- 1 Validation Qualifiers

DATA QUALIFIER	PRECEDENCE	DEFINITION
J	1	Quality control results associated with this sample indicate that the reported concentration value should be considered estimated.
U	2	The analyte was analyzed but not detected above the quantitation limit.
UJ	3	The analyte was analyzed but not detected above the quantitation limit. The quality control results indicate that the quantitation limit of the sample should be considered estimated.
B	4	The analyte was detected in an associated laboratory blank at concentrations within 10% of those detected in the sample. Concentrations in the sample may be the result of contamination at the laboratory.
R	5	Result is not usable due to significant exceedances of quality control criteria.
UR	6	The non-detect result is not usable due to significant exceedances of quality control criteria.

The samples were received at the laboratory with a chain-of-custody in place. The laboratory receipt documentation indicates the temperature at which the samples were received. As per the QAPP (Four Peaks 2022), it is required that the samples be maintained at 4°C or lower during storage and shipping. Any samples received at temperatures greater than 4°C were assigned a J qualifier. For September 6, 2022, and January 25, 2023, the temperatures upon receipt were 4.3°C and 4.2°C, respectively, and therefore, the results were assigned a J qualifier. On June 6, 2023, a delay in delivery by the courier service resulted in the late arrival of the package at the laboratory

with a temperature of 9.1°C. After consulting with the AmTest laboratory, the results were qualified as estimated and assigned a J qualifier.

Sample analyses were evaluated for hold time, which is the time between sample collection and laboratory analysis. The time of analysis was not reported, so holding times accurate to the hour could not be calculated. Instead, holding time was determined using sample and analysis dates within a ± 24-hour window. These calculated holding time ranges were then compared to holding time criteria specified in the QAPP (Four Peaks 2022) to determine whether qualifiers should be applied. In the July 28, 2022 and June 6, 2023 sampling events, some samples were received slightly beyond the designated holding time, resulting in the assignment of a J qualifier. However, for E. *coli* samples in the June 6, 2023 package discussed earlier, they were rejected due to exceeding the 24-hour holding time.

Results were reported to the laboratory practical quantitation limit (PQL). None of the sampling packages received an estimated qualification. The quantitation levels for each analyte were also cross-checked with the values requested in the QAPP. TKN results for January 25, 2023, and April 20, 2023, received a J qualifier as the reporting limit was 0.3 mg/L, whereas the QAPP required it to be 0.25 mg/L.

Laboratory blanks were reviewed for positive detections to assess whether laboratory contamination could have biased results for nutrients, TSS, and chlorophyll *a*. A laboratory blank is typically measured at the start of a batch of samples and subsequently after every 10 samples. Results were qualified as potentially impacted by blank contamination when the reported blank concentration was at least 10 percent of the concertation detected in a field sample on the same laboratory package. There were no blank violations for any of the monitoring events.

Standard reference material samples of known concentration were analyzed, and the results were reported as percent recovered for nutrients, TSS, and chlorophyll *a* parameters. These results served as an additional check on the accuracy of the analytical procedures. All standard reference material results fell within the method-specific control limits.

Laboratory duplicates were prepared by running a duplicate analysis on a field sample. The RPD between the original and duplicate results was used to assess the precision of the analytical procedures. Results with laboratory duplicate RPDs exceeding 20 percent were qualified as estimated. On multiple occasions, different parameters showed RPDs slightly over 20 percent, resulting in the assignment of a J qualifier.

Matrix spikes were prepared by adding a known quantity of an analyte to a field sample and measuring the detected amount of the added analyte. These results are used to assess the

interferences from the sample matrix that could impact result accuracy. Matrix spike recoveries were reported with each laboratory package that measured nutrient and TSS parameters. There were no matrix spike results outside of the method-specific control limits.

Field duplicates were also collected during the study in each sampling event, and the RPD between original and duplicate sample results was reviewed to assess the precision of the field program. RPD values above the 20 percent control limit were assigned J qualifiers. The majority of duplicate result RPDs were below 20 percent, indicating acceptable field sampling precision. However, any samples showing RPD values above the 20 percent control limit at each sampling event received a J qualifier.

A.3 Biological Data

Periphyton and zooplankton data samples underwent validation by a secondary taxonomist who re-identified a second aliquot of 10 percent of the samples. If more than 90 percent of the taxa identified matched, the data passed quality control. All biological data met this quality control criterion.

The periphyton samples collected on January 24, 2023, were not analyzed by the EcoAnalysts laboratory in time for useable chlorophyll *a* results due to a clerical error. Nevertheless, the AFDM and zooplankton results from the same event remained usable. In response, an additional sampling event for periphyton was conducted on February 14, 2023.

A.4 References

Four Peaks Environmental Science and Data Solutions (Four Peaks). 2022. *2022-2023 Water Quality Monitoring Study Plan, Rock Island Hydroelectric Project, FERC Project No. 943*. Prepared for Public Utility District No. 1 of Chelan County.

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Appendix B Consultation Record

Chelan PUD submitted the draft 2022-2023 Water Quality Monitoring Study Report to the Fish and Aquatic Technical Working Group (TWG) (see Table B- 1) via email on October 30, 2023 for a 5-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table B- 2 below.

Table B- 1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
Audubon Society	Johnston, Mark
Blue Leaf	Robichaud, Dave
Blue Leaf	Wright, Corey
Bureau of Indian Affairs	Hatch, Keith
Bureau of Indian Affairs	Lewis, Steve
Bureau of Indian Affairs	Peterson, Harold
Chelan County	Sanderson, Julie
Chelan County Public Utility District No. 1	Underwood, Alene
Chelan County Public Utility District No. 10	Hopkins, Scott
Chelan County Public Utility District No. 11	Towey, William
Chelan County Public Utility District No. 2	Truscott, Ben
Chelan County Public Utility District No. 3	Odell, Brian
Chelan County Public Utility District No. 4	Willard, Catherine
Chelan County Public Utility District No. 5	Ulrich, Janel
Chelan County Public Utility District No. 6	Taylor, Kate
Chelan County Public Utility District No. 7	Keller, Lance
Chelan County Public Utility District No. 8	Clark, Laura
Chelan County Public Utility District No. 9	Vanney, Peter
City of Rock Island	Laughlin, Brock
Columbia River Inter-Tribal Fish Commission	Barton, Diane
Columbia River Inter-Tribal Fish Commission	Carter, Julie
Columbia River Inter-Tribal Fish Commission	Miller, Donella
Columbia River Inter-Tribal Fish Commission	Parker, Blaine
Columbia River Inter-Tribal Fish Commission	Porter, Lauri
Columbia River Inter-Tribal Fish Commission	Skiles, Tom
Confederated Tribes and Bands of Yakama Nation	Blodgett, David
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon

ORGANIZATION	NAME
Confederated Tribes of the Colville Reservation	Baldwin, Casey
Confederated Tribes of the Colville Reservation	McLellan, Jason
Confederated Tribes of the Colville Reservation	Nine, Bret
Confederated Tribes of the Colville Reservation	Truscott, Kirk
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl
Confluence Environmental Company	Doyle, Eric
Environmental Assessment Services	Paulsen, Matt
Four Peaks	Miller, Joe
Four Peaks	Mugunthan, Pradeep
Four Peaks	Nagel, Leah
Golder Associates	Grutter, Paul
Individual	Hays, Steve
Individual	Stuart, Derek
Kearns & West	Day, Mary
Kearns & West	Downing, Jim
Kearns & West	Hessenius, Angela
Kearns & West	Kennedy, Katy
Kearns & West	Rugani, Kelsey
Kleinschmidt Associates	Deason, Jeff
Kleinschmidt Associates	Denis, Nathalie
Kleinschmidt Associates	Keefe, MaryLouise
Kleinschmidt Associates	Smith, Olivia
Kleinschmidt Associates	Steimle, Kai
Kleinschmidt Associates	Thompson, Audrey
National Oceanic and Atmospheric and Administration	Carlon, Scott
National Oceanic and Atmospheric and Administration	Yeager, Justin
Northwest Power and Conservation Council	Horton, Stacy
Northwest Power and Conservation Council	Mounts, Sara
U.S. Bureau of Reclamation	Archuleta, Shannon
U.S. Bureau of Reclamation	Hoff, Gina
U.S. Fish and Wildlife Service	Callaway, Tara
U.S. Fish and Wildlife Service	Gale, William
U.S. Fish and Wildlife Service	Kokos, Sonja
U.S. Fish and Wildlife Service	McKeag, Lizzy
U.S. Fish and Wildlife Service	Muir, Kenneth

ORGANIZATION	NAME
U.S. Fish and Wildlife Service	Nelle, R
U.S. Fish and Wildlife Service	Romine, Jason
Upper Columbia River Salmon Recovery Board	Niemeyer, Ryan
Washington State Department of Ecology	Bugica, Kalman
Washington State Department of Ecology	Oreiro, Tyson
Washington State Department of Ecology	Peterschmidt, Mark
Washington State Department of Ecology	Zimmerman, Breean
Washington State Department of Fish and Wildlife	Blank, Benjamin
Washington State Department of Fish and Wildlife	Burgess, Dave
Washington State Department of Fish and Wildlife	Heironimus, Laura
Washington State Department of Fish and Wildlife	Jackson, Chad
Washington State Department of Fish and Wildlife	Jewell, Sgt
Washington State Department of Fish and Wildlife	Murdoch, Andrew
Washington State Department of Fish and Wildlife	Verhey, Patrick
Washington State Department of Natural Resources	Huinker, James
Washington State Department of Natural Resources	Preston, Cindy
Washington State Parks	Fielding, Andrew
Washington State Parks	Harris, Chelsea

Table B- 2 Comments Received

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
I-1-1	10/30/23	Gina Hoff, Bureau of Reclamation	Rock Island Relicensing Water Quality Monitoring 2022 - 2023 Study Report	No comments, at this time.	Thank you for reviewing the study report.
I-2-1	11/10/23	Steven Hays, Individual	Rock Island Relicensing Water Quality Monitoring 2022 - 2023 Study Report	Thank you for the opportunity to review the report. It is a very clear and complete report that presents the results in a very readable format. I have no comments on the substance of the report because everything was well presented. I did notice a few figures where, due to color changes to some bar graphs and other descriptors, I had to scrutinize to be sure I got it right regarding which location or month was being represented in the figure. These are kind of nitpicking items, but if possible it would help other readers if these figures are revised in the final report. I know it is time consuming to do this so take this as a suggestion for clarity that is not critical. Here are my comments on the report: Figure 5-7: it might help to shade the areas of the graph that are within criteria to help reviewers since for temperature the "all good" zone is below the dashed red line, whereas the DO zone is above the dashed red line. Also, the red line is not identified in the legend of the graph. That may be because the figure appears to be cut off at the bottom due to a page break on my laptop. Figure 5-12: Previous and subsequent figures use the color black for Rocky Reach Tailrace. This one uses the color that is elsewhere used for the Wenatchee River. It would be better to stick with the same color scheme throughout the report. To the extent possible it would be good to be consistent with color selection for figures where different months are represented by different colors. Figure 5-18: All the previous figures have the bar graphs oriented from upstream RR Tailrace, Wenatchee River, RI Forebay and RI Tailrace. This figure seems to have that order reversed, causing confusion.	Thank you for reviewing the study report. The water quality results in Figure 5-7 are not presented with a shading because it would compromise the quality of the data presentation below the shaded area. However, in response to this comment we have added a note that describes the criteria to avoid any ambiguities in interpreting the criteria lines. The color scheme used in Figure 5-12 is consistent with the figures presented earlier. All these figures use different shades of green: darkest – Rocky Reach Tailrace; second darkest – Wenatchee River; third darkest – Rock Island Forebay; and lightest – Rock Island Tailrace. Note that, for Figure 5-12 there is no Wenatchee River data, so the corresponding bars are not included. We have reversed the plotting order of Figure 5-18 to be consistent with other figures as suggested.
I-3-1	11/08/23	Breean Zimmerman, Department of Ecology	Rock Island Relicensing Water Quality Monitoring 2022 - 2023 Study Report	Thank you for the opportunity to review the RI Water Quality Monitoring Study Report. At this time, Ecology has no additional comments on this report.	Thank you for reviewing the study report.

From:	RIRelicensing
To:	"aaronjackson@ctuir.org"; "AHessenius@kearnswest.com"; Alene Underwood; "andrew.fielding@parks.wa.gov"; "Andrew.Murdoch@dfw.wa.gov"; "AudieHuber@ctuir.org"; "Audrey.Thompson@kleinschmidtgroup.com"; "bard@critfc.org"; Ben Truscott; "Benjamin.Blank@dfw.wa.gov"; "bladescodeservices@yahoo.com"; "blod@yakamafish-nsn.gov"; "brenthall@ctuir.org"; "bret.nine@colvilletribes.com"; Brian Odell; "bzim461@ecy.wa.gov"; "carj@critfc.org"; "CarlMerkle@ctuir.org"; "Casey.Baldwin@colvilletribes.com"; Catherine Willard; "chad.jackson@dfw.wa.gov"; "Chelsea.Harris@parks.wa.gov"; "cindy.preston@dnr.wa.gov"; "cwright@lgl.com"; "dave.burgess@dfw.wa.gov"; "dmiller@critfc.org"; "drobichaud@lgl.com"; "DStuart@nhcweb.com"; "elizabeth_mckeag@fws.gov"; "eric.doyle@confenv.com"; "ghoff@usbr.gov"; "Harold.Peterson@bia.gov"; "ivet@yakamafish-nsn.gov"; "James.Huinker@dnr.wa.gov"; Janel Ulrich; "jason.mclellan@colvilletribes.com"; "jason_romine@fws.gov"; "jdowning@kearnswest.com"; "jeff.deason@kleinschmidtgroup.com"; "jmiller@fourpeaksenv.com"; "julie.sanderson@co.chelan.wa.us"; "justin.yeager@noaa.gov"; "kai.steimle@kleinschmidtgroup.com"; "kalman.bugica@ecy.wa.gov"; Kate Taylor; "keith.hatch@indianaffairs.gov"; "kenneth_muir@fws.gov"; "kirk.truscott@colvilletribes.com"; "kkennedy@kearnswest.com"; "krugani@kearnswest.com"; "lamr@yakamafish-nsn.gov"; Lance Keller; Laura Clark; "laura.heironimus@dfw.wa.gov"; "lnagel@fourpeaksenv.com"; "mape461@ecy.wa.gov"; "marylouise.keefe@kleinschmidtgroup.com"; "matt.paulsen@komanholdings.com"; "mbday@kearnswest.com"; "murk@yakamafish-nsn.gov"; "Nathalie.Denis@Kleinschmidtgroup.com"; "oliviasmith23@hotmail.com"; "parb@critfc.org"; "Patrick.Verhey@dfw.wa.gov"; "Paul_Grutter@golder.com"; Peter Vanney; "pmugunthan@fourpeaksenv.com"; "porl@critfc.org"; "RD_Nelle@fws.gov"; "rogb@yakamafish-nsn.gov"; "Ryan.niemeyer@ucsrb.org"; "sarchuleta@usbr.gov"; "scott.carlon@noaa.gov"; Scott Hopkins; "sghays51@msn.com"; "shorton@nwcouncil.org"; "skit@critfc.org"; "SMounts@NWCouncil.org"; "Sonja_Kokos@fws.gov"; "stephen.lewis@bia.gov"; "tara_callaway@fws.gov"; "tore461@ecy.wa.gov"; "toxostoma495@gmail.com"; Bill Towey; "william_gale@fws.gov"; RIRelicensing
Subject:	RE: RI Relicensing Water Quality Monitoring 2022 – 2023 Study Report - Comment Opportunity
Date:	Friday, November 3, 2023 8:06:02 AM
Attachments:	image001.png

Good morning,

This is a reminder that comments on the Water Quality Monitoring 2022 – 2023 Study Report are due **by EOD today, Friday, November 3.**
Click the link to access the document and submit your comments. Again, if you have no comments after your review, we appreciate the submission through the Smart Comment platform of "no comment" as that is helpful for the consultation record.

Thank you,

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Monday, October 30, 2023 7:58 AM
To: 'aaronjackson@ctuir.org' <aaronjackson@ctuir.org>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; Alene Underwood <Alene.Underwood@chelanpud.org>; 'andrew.fielding@parks.wa.gov' <andrew.fielding@parks.wa.gov>; 'Andrew.Murdoch@dfw.wa.gov' <Andrew.Murdoch@dfw.wa.gov>; 'AudieHuber@ctuir.org' <AudieHuber@ctuir.org>; 'Audrey.Thompson@kleinschmidtgroup.com' <Audrey.Thompson@kleinschmidtgroup.com>; 'bard@critfc.org' <bard@critfc.org>; Ben Truscott <Ben.Truscott@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'blod@yakamafish-nsn.gov' <blod@yakamafish-nsn.gov>; 'brenthall@ctuir.org' <brenthall@ctuir.org>; 'bret.nine@colvilletribes.com' <bret.nine@colvilletribes.com>; Brian Odell <brian.odell@chelanpud.org>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'carj@critfc.org' <carj@critfc.org>; 'CarlMerkle@ctuir.org' <CarlMerkle@ctuir.org>; 'Casey.Baldwin@colvilletribes.com' <Casey.Baldwin@colvilletribes.com>;

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Subject: RI Relicensing Water Quality Monitoring 2022 – 2023 Study Report - Comment Opportunity

Good morning,

Here is the link to comment on the Water Quality Monitoring 2022 – 2023 Study Report. Click the link to access the document and submit your comments.
If you have no comments after your review, we appreciate the submission through the Smart Comment platform of "no comment" as that is helpful for the consultation record.

Comments are to be submitted by EOD Friday, November 3, 2023.

Thank you for your participation.

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Rock Island Relicensing Water Quality Monitoring 2022 - 2023 Study Report

Chelan County PUD invites stakeholders to provide comments on our draft study plan. Please review the document (click "Review Document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email

Your Comment

Comments can be submitted through an attachment or provided directly in the space below.

Review Document

Insert comments on Rock Island Relicensing Water Quality Monitoring 2022 - 2023 Study Report

Upload a File

Uploading a file is optional

You may attach up to five 20 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment please contact the person listed at the bottom of this page.

Continue

G.2 MACROPHYTES STUDY PLAN AND STUDY REPORT

MACROPHYTES STUDY PLAN - FINAL

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943

Source: Kleinschmidt 2021

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY

327 N. WENATCHEE AVENUE

WENATCHEE, WA 98801

JUNE 2023

MACROPHYTES STUDY PLAN - FINAL

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

EAS ENVIRONMENTAL ASSESSMENT SERVICES

JUNE 2023

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TERMS AND ABBREVIATION LIST

B	
BRZ	boat restricted zone
C	
Chelan PUD	Public Utility District No. 1 of Chelan County
F	
FERC	Federal Energy Regulatory Commission
G	
GIS	geographic information system
GPS	global positioning system
I	
ILP	Integrated Licensing Process
M	
mph	miles per hour
N	
NGVD 29	National Geodetic Vertical Datum 1929
P	
PAD	Preliminary Application Document
R	
RM	river mile
Rock Island Project	Rock Island Hydroelectric Project FERC No. 943
T	
TWG	technical working group

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Rock Island Project). The Rock Island Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Project, which will utilize the Integrated Licensing Process (ILP). Chelan PUD intends to implement this study plan in 2023 and append the study report to the Pre-Application Document (PAD), which will be filed with FERC and distributed to relicensing participants when the ILP commences in late 2023. Decision criteria for early study plan development and implementation have been designed to match those described in FERC's guidance for applying study criteria in the ILP[1] .

[1] FERC, *A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria* (March 2012). https://www.ferc.gov/sites/default/files/2020-07/guide-study-criteria.pdf

2.0 STUDY GOALS AND OBJECTIVES

Currently, there is limited information on macrophyte beds in the Rock Island Reservoir. Documenting the presence and abundance of native macrophyte species, along with monitoring the distribution of invasive species such as Eurasian watermilfoil (*Myriophyllum spicatum*), curly leaf pondweed (*Potamogeton crispus*), and flowering rush (*Butomus umbellatus*) is needed to support relicensing efforts. The goal of this study is to address the current data gap by characterizing the distribution and species composition of macrophyte beds in the Rock Island Reservoir.

This study is based on the issue statement developed by the Technical Working Group (TWG) during early engagement, which states:

"Limited aquatic macrophyte data are available on the mainstem Columbia River within the Rock Island Project to support certification of Project operations' compliance with water quality standards."

The objective of the macrophyte study is to locate and map presence of macrophyte beds throughout the Rock Island Reservoir and to document the dominant and subdominant macrophyte species found in each bed. A geographic information system (GIS) layer containing polygons of macrophyte beds and a table of species presence by macrophyte bed will be produced which can inform management decisions in the future.

3.0 RELEVANT RESOURCE MANAGEMENT GOALS OR PUBLIC INTEREST CONSIDERATIONS

The presence and species composition of macrophytes can impact habitat quality and recreational opportunities. For example, the growth and spread of invasive aquatic macrophyte species can affect the quality of fish habitat available for use by federally listed fish species, including physical structure and water quality (Dibble 1997). The presence of native aquatic macrophyte species can also provide benefits to fish and other aquatic animals, improve water quality, and act as natural erosion control (Dibble 1997, Madsen 2001). Macrophytes can also be a nuisance to the public, which use Rock Island Reservoir for recreation. Macrophytes can damage recreational watercraft and invasive species can be spread accidentally from waterbody to waterbody by recreational boaters (Kelly 2012, Lê 2006).

4.0 GEOGRAPHIC SCOPE

The Rock Island Project is located on the Columbia River near the cities of Wenatchee and East Wenatchee in Chelan County and Douglas County, Washington, from river mile (RM) 453.4 to RM 473.7. The Study Area encompasses the Rock Island Reservoir, as depicted in Figure 4-1. The Study Area includes the boat restricted zone (BRZ) in the forebay of Rock Island Dam, however field surveys will not be conducted in the BRZ due to safety concerns.

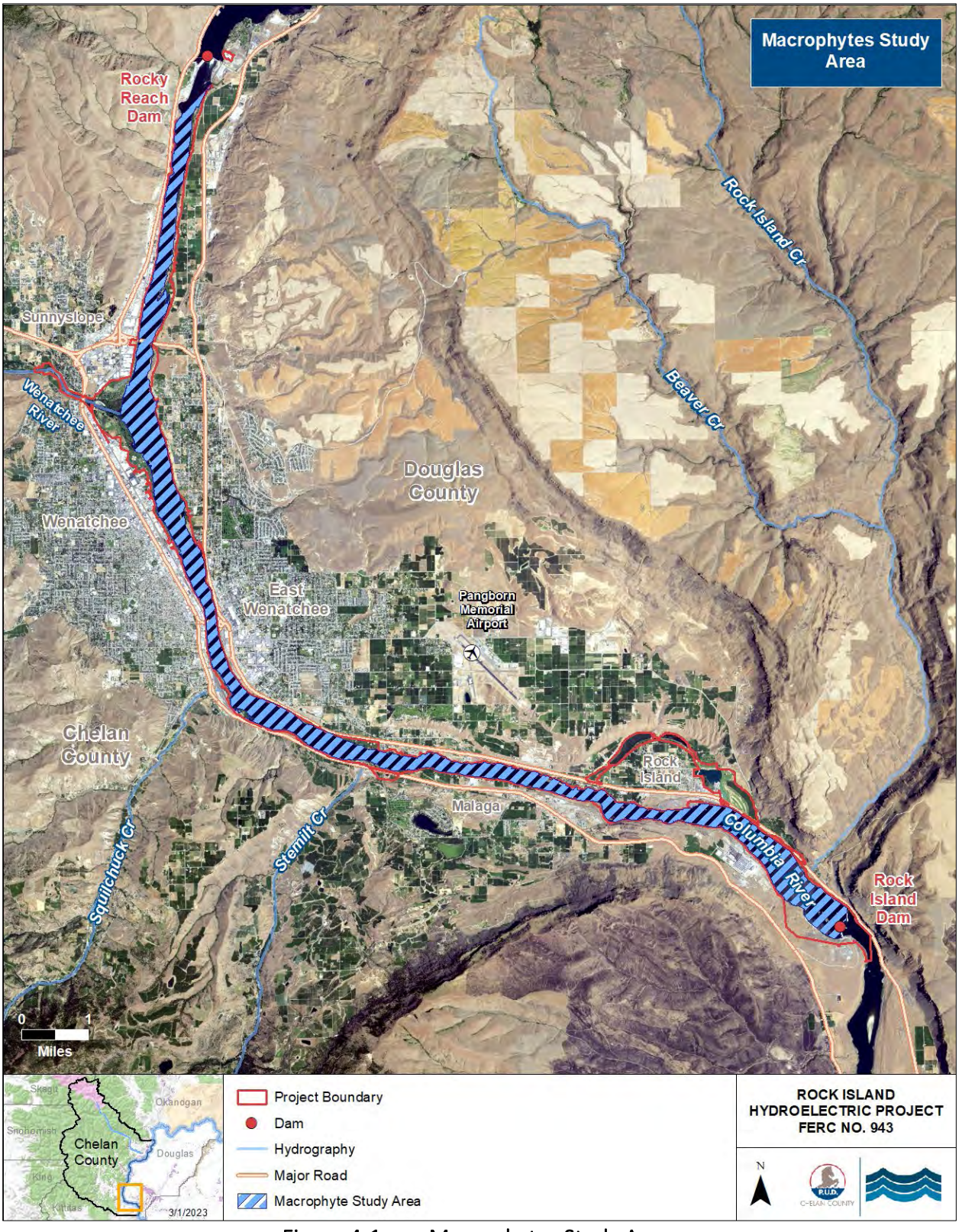

Figure 4-1 Macrophytes Study Area

5.0 EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

There is little known about the location and species composition of macrophyte beds in the Rock Island reservoir. Macrophyte surveys were conducted in Rock Island Reservoir from 1984 through 1990 (Truscott 1990). The goal of these surveys was to identify the species of macrophytes present and estimate species composition of macrophyte beds. Aside from these surveys, there has been no macrophyte work conducted in Rock Island Reservoir between 1990-2023.

According to surveys conducted on the Rock Island Reservoir during 1990, there were 218 acres of macrophyte beds present, and milfoil was increasingly displacing native species in those areas since associated surveys began in 1984 (Truscott 1990). Other species documented in the Rock Island Reservoir during the 1990 survey included curly leaf pondweed, small pondweed (*Potamogeton pusillus*) and common waterweed (*Elodea canadensis*). Recent surveys conducted in Rocky Reach reservoir, the reservoir immediately upstream of the Rock Island Project, documented the presence of native macrophyte species including common waterweed, coontail (*Ceratophyllum demersum*), water star-grass (*Heteranthera dubia*), white-stemmed pondweed (*Potamogeton praelongus*), and flat-stemmed pondweed (*Potamogeton zosteriformis*), and non-native invasive species including Eurasian watermilfoil, curly leaf pondweed, and flowering rush (Chelan PUD 2021 and 2023). Due to the close proximity to the Rocky Reach Reservoir, a similar species assemblage may be present in the Rock Island Reservoir. These ongoing studies at Rocky Reach Reservoir show that macrophyte composition and coverage changes significantly year to year.

6.0 PROJECT NEXUS AND RATIONALE FOR STUDY

Both native and non-native invasive macrophyte species have the potential to affect water quality and fish habitat. Project operations may impact the abundance and distribution of macrophytes in the Rock Island Reservoir. Due to the lack of recent macrophyte data for the Rock Island Reservoir, a survey of the reservoir would provide useful information that is currently not available. Given the documented presence of the invasive species Eurasian watermilfoil, curly leaf pondweed, and flowering rush in the nearby Rocky Reach Reservoir, a better understanding of the geographic distribution and species composition of macrophyte beds present in the Rock Island Reservoir is needed. This study will fill that data gap, producing a GIS layer containing the locations and acreage of macrophyte beds. Data collected from this study will provide a more complete picture of the macrophyte beds that currently exist in the Rock Island Reservoir and provide baseline conditions that can be used to monitor and track the distribution of native and invasive aquatic plant species throughout the reservoir.

7.0 STUDY METHODOLOGY

The study design will be comprised of three major steps: a desktop review/interpretation, field surveys, and post-survey analysis.

7.1 Desktop Review and Interpretation

Existing maps, aerial imagery, and bathymetry data will be analyzed within a GIS framework to determine areas likely to contain macrophyte beds. Macrophyte beds visible in aerial imagery will be digitized using GIS (Marshall and Lee 1994). Using high-quality satellite imagery, areas containing macrophytes can be seen as darker patches of water. In ArcMap, polygons will be drawn around the boundaries of suspected macrophyte beds based on the aerial imagery and a GIS layer will be created. The polygon layer will then be transferred to a Trimble GPS unit which will be brought into the field during the field surveys. The initial digitized polygon layer will be used as a starting point and polygons will either be confirmed or modified in the field.

7.2 Field Surveys

Surveyors will conduct site visits/surveys to verify or modify the previously digitized macrophyte bed polygons and map macrophyte beds that were not identified during the desktop review. These surveys will be conducted by a team of two staff members, operating a 19- to 25-foot motorboat. An inflatable kayak will be used in areas unreachable by the larger boat. Survey vessels will travel at a slow speed, around 3 miles per hour (mph), with surveyors visually assessing areas where macrophytes may be present. Surveyors will assess the previously digitized areas as well as any areas where macrophytes were not visible on aerial imagery. When a macrophyte bed is identified, surveyors will drive along the edge of the deepest visible extent of the macrophyte bed to assess the accuracy of the digitized areas and record any changes needed based on visual observations using a sub-meter accurate Trimble GPS device (Berg 2016). Using sunglasses with polarized lenses, the deepest extent surveyors can confidently identify macrophytes is typically 10 to 15 feet, depending on environmental factors such as water clarity, and wave action or sun angle on the water surface. Surveyors will visually assess the dominant and sub-dominant macrophyte species present at 60-foot transects across the macrophyte beds, documenting all species observed (Appendix A) within each distinct bed and focusing on the detection of flowering rush. A dual-sided rake will be utilized to collect macrophytes when species identification cannot be determined visually from the boat. Areas between the outer edge and the shoreline that do not contain macrophytes will be recorded with a GPS and removed from the final macrophyte bed polygon. Any flowering rush observations will be recorded via GPS as individual points. These survey methods are consistent with those used at the Rocky Reach Reservoir (Chelan PUD 2021).

7.3 Analysis

Analysts will import GPS data into ArcGIS and enter all field data into a digital database. Macrophyte bed polygons identified during the desktop review will be modified based on geospatial data collected during field surveys to create final macrophyte bed polygons. This finalized GIS layer can be used to display the locations of the macrophyte beds and to calculate the total acreage of macrophyte beds present in the reservoir. The digital database will contain a record of the acreage a macrophyte bed covers along with the dominant macrophyte species present in the bed and the other species occurrences.

8.0 SCHEDULE, PERIODIC REPORTING, AND ON-GOING CONSULTATION

Desktop review and interpretation of aerial imagery and bathymetry data will occur through the spring of 2023. Field work will be conducted during summer 2023, between July and September to ensure the surveys occur at a point in the growing cycle when macrophytes are more easily identifiable (DiFranco 2019). A draft report will be provided for TWG review in October 2023. The final report, including TWG input and consultation record, is expected to be completed by the end of November 2023.

The consultation record for this plan is included in Appendix B.

9.0 LEVEL OF EFFORT AND COST

The estimated costs for the above-described desktop analyses and field surveys are $120,000.

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APPENDIX A FIELD DATA FORM

Table A- 1 Field Form

Polygon Number	**Eurasian Watermilfoil** *(Myriophyllum spicatum)*	**Curly Leaf Pondweed** *(Potamogeton crispus)*	**Common Waterweed** *(Elodea canadensis)*	**Coontail** *(Ceratophyllum demersum)*	**Water Star-grass** *(Heteranthera dubia)*	**White-Stemmed Pondweed** *(Potamogeton praelongus)*	**Flat-stemmed Pondweed** *(Potamogeton zosteriformis)*	**Other**	**Comments**
	MYSP	**POCR**	**ELCA**	**CEDE**	**HEDU**	**POPR**	**POZO**	**OTHER**	
RI001									
RI002									
RI003									
RI004									
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APPENDIX B CONSULTATION RECORD

Chelan PUD submitted the draft Macrophytes Study Plan to the Fish and Aquatic Technical Working Group (TWG) (see Table B- 1) via email on March 30, 2023 for a 10-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table B- 2 below.

Table B- 1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
American Rivers	Bridget Moran
Audubon Society	Mark Johnston
Blue Leaf	Corey Wright
Blue Leaf	Dave Robichaud
Bureau of Indian Affairs (BIA)	Harold Peterson
BIA	Keith Hatch
BIA	Steve Lewis
Cascade Fisheries	Jason Lundgren
Chelan County	Julie Sanderson
Chelan County PUD (Chelan PUD)	Alene Underwood
Chelan PUD	Ben Truscott
Chelan PUD	Brian Odell
Chelan PUD	Catherine Willard
Chelan PUD	Janel Ulrich
Chelan PUD	Kate Taylor
Chelan PUD	Lance Keller
Chelan PUD	Laura Clark
Chelan PUD	Peter Vanney
Chelan PUD	Scott Hopkins
Chelan PUD	William Towey
City of Rock Island	Brock Laughlin
Columbia River Inter-Tribal Fish Commission (CRITFC)	Blaine Parker
CRITFC	Diane Barton
CRITFC	Donella Miller
CRITFC	Julie Carter
CRITFC	Lauri Porter
CRITFC	Tom Skiles
Confederated Tribes of the Colville Reservation (CTCR)	Bret Nine
CTCR	Casey Baldwin
CTCR	Jason McLellan
CTCR	Kirk Truscott
CTCR	Renata Rollins

ORGANIZATION	NAME
Confederated Tribes of the Umatilla Indian Reservation	Aaron Jackson
Confederated Tribes of the Umatilla Indian Reservation	Audie Huber
Confederated Tribes of the Umatilla Indian Reservation	Brent Hall
Confederated Tribes of the Umatilla Indian Reservation	Carl Merkle
Confluence Environmental Company	Eric Doyle
WA department of Natural Resources (WADNR)	Cindy Preston
WADNR	James Huinker
Environmental Assessment Services	Matt Paulsen
Washington Department of Ecology (Ecology)	Breean Zimmerman
Ecology	Kalman Bugica
Ecology	Mark Peterschmidt
Ecology	Tyson Oreiro
Four Peaks	Joe Miller
Four Peaks	Joshua Murauskas
Four Peaks	Leah Nagel
Four Peaks	Pradeep Mugunthan
Golder Associates	Paul Grutter
Individual	Derek Stuart
Individual	Steve Hays
Kearns & West	Angela Hessenius
Kearns & West	Jim Downing
Kearns & West	Katy Kennedy
Kearns & West	Kelsey Rugani
Kearns & West	Mary Beth Day
Kleinschmidt Associates	Audrey Thompson
Kleinschmidt Associates	Jeff Deason
Kleinschmidt Associates	Kai Steimle
Kleinschmidt Associates	MaryLouise Keefe
Kleinschmidt Associates	Nathalie Denis
National Oceanic and Atmospheric and Administration (NOAA)	Justin Yeager
NOAA	Scott Carlon
Northwest Power and Conservation Council (NPCC)	Sara Mounts
NPCC	Stacy Horton
Upper Columbia River Salmon Recovery Board	Tracy Bowerman
US Bureau of Reclamation (USBR)	Gina Hoff
USBR	Shannon Archuleta
US Fish and Wildlife Service (USFWS)	Jason Romine
USFWS	Jerrmaine Treadwell
USFWS	Judy Neibauer

ORGANIZATION	NAME
USFWS	Kenneth Muir
USFWS	R.D. Nelle
USFWS	Sonja Kokos
USFWS	Tara Callaway
USFWS	William Gale
WA Parks	Andrew Fielding
WA Parks	Chelsea Harris
Washington Department of Fish and Wildlife (WDFW)	Andrew Murdoch
WDFW	Benjamin Blank
WDFW	Chad Jackson
WDFW	Dave Burgess
WDFW	Laura Heironimus
WDFW	Patrick Verhey
Confederated Tribes and Bands of the Yakama Nation (Yakama Nation)	Brandon Rogers
Yakama Nation	David Blodgett
Yakama Nation	Elaine Harvey
Yakama Nation	Keely Murdoch
Yakama Nation	Ralph Lampman
Yakama Nation	Tom Iverson

Table B- 2 Comments Received

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
I-1-1	4/12/23	Sara Mounts, NWPCC	Rock Island Relicensing Macrophytes Study Plan	No Comments	Thank you for reviewing the study plan.
I-2-1	4/12/23	Steven Hays, Individual	Rock Island Relicensing Macrophytes Study Plan	Thanks for the opportunity to review. I have one comment on survey methods and one anecdotal comment. On method: At least some of the larger macrophyte beds, particularly any that are in 10-15 feet depths and on bars or other areas detached from the shoreline, should be surveyed twice for species composition. The species dominant in June-July can shift from native pondweeds to Eurasian watermilfoil by late August. I observed this on the Rocky Reach reservoir during water quality surveys, particularly in the Daroga Park area where large macrophyte beds were present on a mid-channel area not contiguous with the shoreline macrophyte beds. The pondweeds appeared to have topped out earlier in the summer, then died back as Eurasian watermilfoil topped out in late summer. Anecdotal: The surveys conducted 1984-1990 were only 5-11 years after the 1979 pool raise (6.1 ft.) so aquatic plant communities were still probably adjusting	While the differences in biomass earlier in the summer may make it appear that there are more native plants, the invasive plants are still there, just in a different part of their lifecycle. Additionally, curly leaf pondweed and white-stemmed pond weed can be difficult to differentiate early in the summer. Because accuracy of macrophyte bed composition relies on visibility, timing of our surveys should be during peak visibility of all species, which occurs in late July/August. We recognize that milfoil canopy cover at the surface can impede the ability to identify species lower in the water, however milfoil will not peak until after our surveys, so visibility of plants below the surface should still be acceptable, which is evidenced by our survey results in the Rocky Reach reservoir where we have successfully identified lower lying native species, even when milfoil is present. Additionally, species dominance will be based off the number of plants present, not biomass or percent coverage.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
				to the new depth profiles during that period of years.	
A-1-1	4/12/23	Jerrmaine Treadwell, USFWS	Rock Island Relicensing Macrophytes Study Plan	No comment at this time. Thank you.	Thank you for reviewing the study plan.
A-2-1	4/25/23	Breean Zimmerman	Ecology	The plan mentions using a plant rake to help with species identification, but unless the surveyors can see to the bottom of the river (or to the vegetation growing along the bottom), then the species composition can't be known/assumed, and the rake will need to be used to determine the presence of low-growing species or those that are covered by taller vegetation. With that said, a plant rake would not be advised in dense beds of invasive species such as Eurasian watermilfoil, curly-leaf pondweed, and flowering rush, where fragmentation and downstream spread is a major concern. With the balance of speed and accuracy for these surveys there's an understanding of reliance primarily on visual observations, but detection of invasive plant populations at deeper depths and within beds of native plants is critical and will require routine use of the plant rake.	For this study plan, the outer edges of the macrophyte beds are defined and established by visible macrophytes (typically no more than 10-15 feet deep). Species composition of the macrophyte beds (dominant and sub-dominant species) is determined by transecting the macrophyte beds for visual species identification and covers all areas between the outer and inner edges of the beds. The rake is only used to collect a sample when a plant is observed but surveyors are unable to identify it. The study plan has been updated to provide clarity (lines 112 – 113).
A-2-2	4/25/23	Breean Zimmerman	Ecology	Recommend collecting more fine-scale spatial data for any flowering rush	Any flowering rush observations will be recorded via GPS as individual points. The

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
				observations, i.e., recording individual GPS points if any plants are found, instead of grouping these observations with those for an entire macrophyte bed.	study plan has been updated to provide clarity (line 115).
A-2-3	4/25/23	Breean Zimmerman	Ecology	Will the survey's spatial data be shared with Ecology? In addition, if any flowering rush is found, it would be important to add the corresponding spatial data to an existing dataset housed with WSDA (Columbia River CWMA, Flowering Rush Surveys (arcgis.com)).	Geospatial data for any flowering rush observations will be shared with Ecology. Chelan PUD will coordinate with Ecology to ensure flowering rush geospatial data are disseminated to the existing database maintained by the Washington State Department of Agriculture.

Kate Taylor

From: RIRelicensing
Sent: Thursday, March 30, 2023 7:43 AM
To: 'jason@ccfeg.org'; 'murk@yakamafish-nsn.gov'; 'bmoran@americanrivers.org'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'tracy.bowerman@ucsrb.org'; 'Andrew.Murdoch@dfw.wa.gov'; 'Patrick.Verhey@dfw.wa.gov'; RIRelicensing; 'Nathalie.Denis@Kleinschmidtgroup.com'; 'Sonja_Kokos@fws.gov'; 'hare@yakamafish-nsn.gov'; 'kai.steimle@kleinschmidtgroup.com'; 'andrew.fielding@parks.wa.gov'; Alene Underwood; 'Audrey.Thompson@kleinschmidtgroup.com'; 'Benjamin.Blank@dfw.wa.gov'; Bill Towey; 'rogb@yakamafish-nsn.gov'; 'brenthall@ctuir.org'; Brian Odell; Catherine Willard; 'chad.jackson@dfw.wa.gov'; 'Chelsea.Harris@parks.wa.gov'; 'cindy.preston@dnr.wa.gov'; 'dave.burgess@dfw.wa.gov'; 'blod@yakamafish-nsn.gov'; 'mild@yakamafish-nsn.gov'; 'James.Huinker@dnr.wa.gov'; 'keith.hatch@indianaffairs.gov'; Lance Keller; 'laura.heironimus@dfw.wa.gov'; 'marylouise.keefe@kleinschmidtgroup.com'; 'lamr@yakamafish-nsn.gov'; 'RD_Nelle@fws.gov'; Scott Hopkins; 'shorton@nwcouncil.org'; 'sghays51@msn.com'; 'ivet@yakamafish-nsn.gov'; 'william_gale@fws.gov'; 'judy_neibauer@fws.gov'; 'jason.mclellan@colvilletribes.com'; 'bret.nine@colvilletribes.com'; 'aaronjackson@ctuir.org'; 'justin.yeager@noaa.gov'; 'porl@critfc.org'; 'Casey.Baldwin@colvilletribes.com'; 'Douglas.Marconi@colvilletribes.com'; 'scott.carlon@noaa.gov'; 'mape461@ecy.wa.gov'; 'skit@critfc.org'; 'pmugunthan@fourpeaksenv.com'; 'ghoff@usbr.gov'; 'cwright@lgl.com'; 'drobichaud@lgl.com'; 'AudieHuber@ctuir.org'; 'jmiller@fourpeaksenv.com'; 'SMounts@NWCouncil.org'; 'tore461@ecy.wa.gov'; 'AHessenius@kearnswest.com'; 'krugani@kearnswest.com'; 'Paul_Grutter@golder.com'; 'eric.doyle@confenv.com'; 'mbday@kearnswest.com'; 'jdowning@kearnswest.com'; 'carj@critfc.org'; Ben Truscott; 'kenneth_muir@fws.gov'; 'toxostoma495@gmail.com'; Janel Ulrich; Kate Taylor; 'sarchuleta@usbr.gov'; 'julie.sanderson@co.chelan.wa.us'; 'bladescodeservices@yahoo.com'; 'bard@critfc.org'; 'parb@critfc.org'; 'lnagel@fourpeaksenv.com'; 'kkennedy@kearnswest.com'; 'stephen.lewis@bia.gov'; 'jmurauskas@fourpeaksenv.com'; 'jeff.deason@kleinschmidtgroup.com'; 'CarlMerkle@ctuir.org'; 'jason_romine@fws.gov'; 'jerrmaine_treadwell@fws.gov'; 'tara_callaway@fws.gov'; 'matt.paulsen@komanholdings.com'
Subject: RI Relicensing Macrophytes Study Plan Draft - Comment Opportunity

Good morning,

Here is the link to comment on the Rock Island Relicensing Macrophytes Study Plan Draft. Click the link to access the document and submit your comments.
If you have no comments after your review, we appreciate the submission through the Smart Comment platform of "no comment" as that is helpful for the consultation record.

Comments are to be submitted **by EOD Thursday, April 13, 2023**.

Thank you for your participation.

Kate Taylor
Licensing & Compliance Specialist II
Chelan PUD
509-661-4410

Kate Taylor

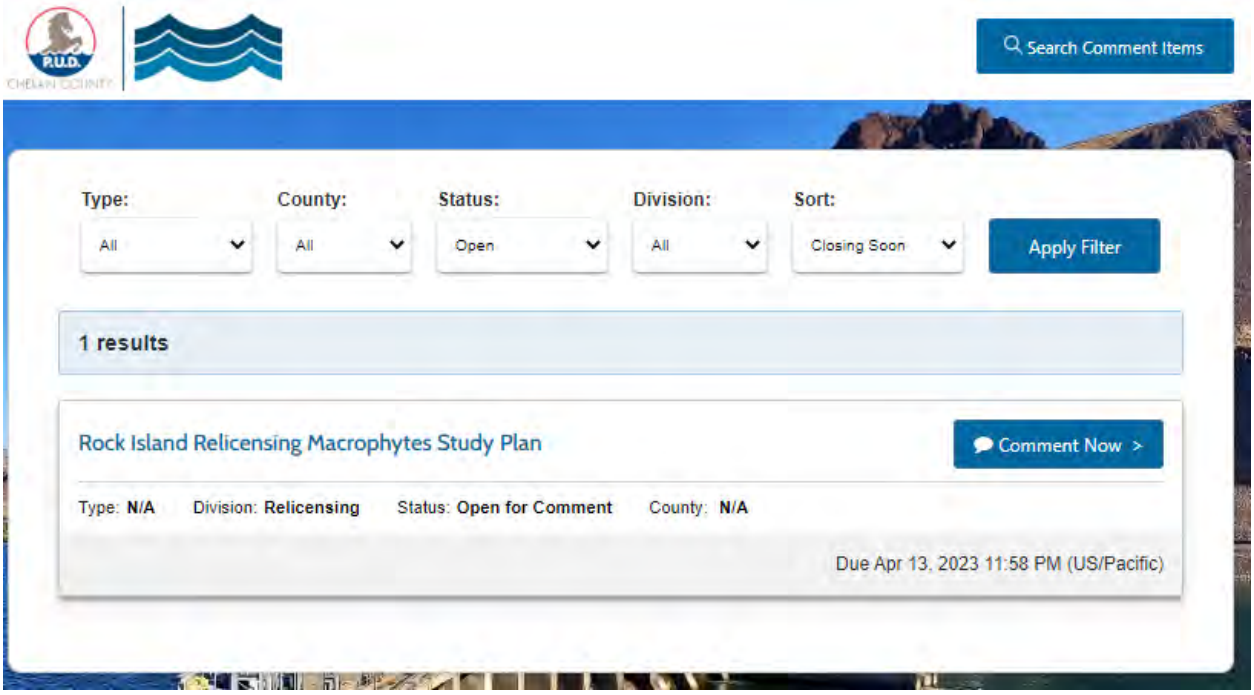
From: RIRelicensing
Sent: Tuesday, April 11, 2023 9:50 AM
To: RIRelicensing; 'jason@ccfeg.org'; 'murk@yakamafish-nsn.gov'; 'bmoran@americanrivers.org'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'tracy.bowerman@ucsrb.org'; 'Andrew.Murdoch@dfw.wa.gov'; 'Patrick.Verhey@dfw.wa.gov'; 'Nathalie.Denis@Kleinschmidtgroup.com'; 'Sonja_Kokos@fws.gov'; 'hare@yakamafish-nsn.gov'; 'kai.steimle@kleinschmidtgroup.com'; 'andrew.fielding@parks.wa.gov'; Alene Underwood; 'Audrey.Thompson@kleinschmidtgroup.com'; 'Benjamin.Blank@dfw.wa.gov'; Bill Towey; 'rogb@yakamafish-nsn.gov'; 'brenthall@ctuir.org'; Brian Odell; Catherine Willard; 'chad.jackson@dfw.wa.gov'; 'Chelsea.Harris@parks.wa.gov'; 'cindy.preston@dnr.wa.gov'; 'dave.burgess@dfw.wa.gov'; 'blod@yakamafish-nsn.gov'; 'mild@yakamafish-nsn.gov'; 'James.Huinker@dnr.wa.gov'; 'keith.hatch@indianaffairs.gov'; Lance Keller; 'laura.heironimus@dfw.wa.gov'; 'marylouise.keefe@kleinschmidtgroup.com'; 'lamr@yakamafish-nsn.gov'; 'RD_Nelle@fws.gov'; Scott Hopkins; 'shorton@nwcouncil.org'; 'sghays51@msn.com'; 'ivet@yakamafish-nsn.gov'; 'william_gale@fws.gov'; 'judy_neibauer@fws.gov'; 'jason.mclellan@colvilletribes.com'; 'bret.nine@colvilletribes.com'; 'aaronjackson@ctuir.org'; 'justin.yeager@noaa.gov'; 'porl@critfc.org'; 'Casey.Baldwin@colvilletribes.com'; 'Douglas.Marconi@colvilletribes.com'; 'scott.carlon@noaa.gov'; 'mape461@ecy.wa.gov'; 'skit@critfc.org'; 'pmugunthan@fourpeaksenv.com'; 'ghoff@usbr.gov'; 'cwright@lgl.com'; 'drobichaud@lgl.com'; 'AudieHuber@ctuir.org'; 'jmiller@fourpeaksenv.com'; 'SMounts@NWCouncil.org'; 'tore461@ecy.wa.gov'; 'AHessenius@kearnswest.com'; 'krugani@kearnswest.com'; 'Paul_Grutter@golder.com'; 'eric.doyle@confenv.com'; 'mbday@kearnswest.com'; 'jdowning@kearnswest.com'; 'carj@critfc.org'; Ben Truscott; 'kenneth_muir@fws.gov'; 'toxostoma495@gmail.com'; Janel Ulrich; Kate Taylor; 'sarchuleta@usbr.gov'; 'julie.sanderson@co.chelan.wa.us'; 'bladescodeservices@yahoo.com'; 'bard@critfc.org'; 'parb@critfc.org'; 'lnagel@fourpeaksenv.com'; 'kkennedy@kearnswest.com'; 'stephen.lewis@bia.gov'; 'jmurauskas@fourpeaksenv.com'; 'jeff.deason@kleinschmidtgroup.com'; 'CarlMerkle@ctuir.org'; 'jason_romine@fws.gov'; 'jerrmaine_treadwell@fws.gov'; 'tara_callaway@fws.gov'; 'matt.paulsen@komanholdings.com'
Subject: RE: RI Relicensing Macrophytes Study Plan Draft - Comment Opportunity

Good morning,

This is a reminder that comments on the Rock Island Relicensing Macrophytes Study Plan Draft are due by **end of day this Thursday, April 13**.
Click the link to access the document and submit your comments. Again, if you have no comments after your review, we appreciate the submission through the Smart Comment platform of “no comment” as that is helpful for the consultation record.

Thank you,

Kate Taylor
Licensing & Compliance Specialist II
Chelan County PUD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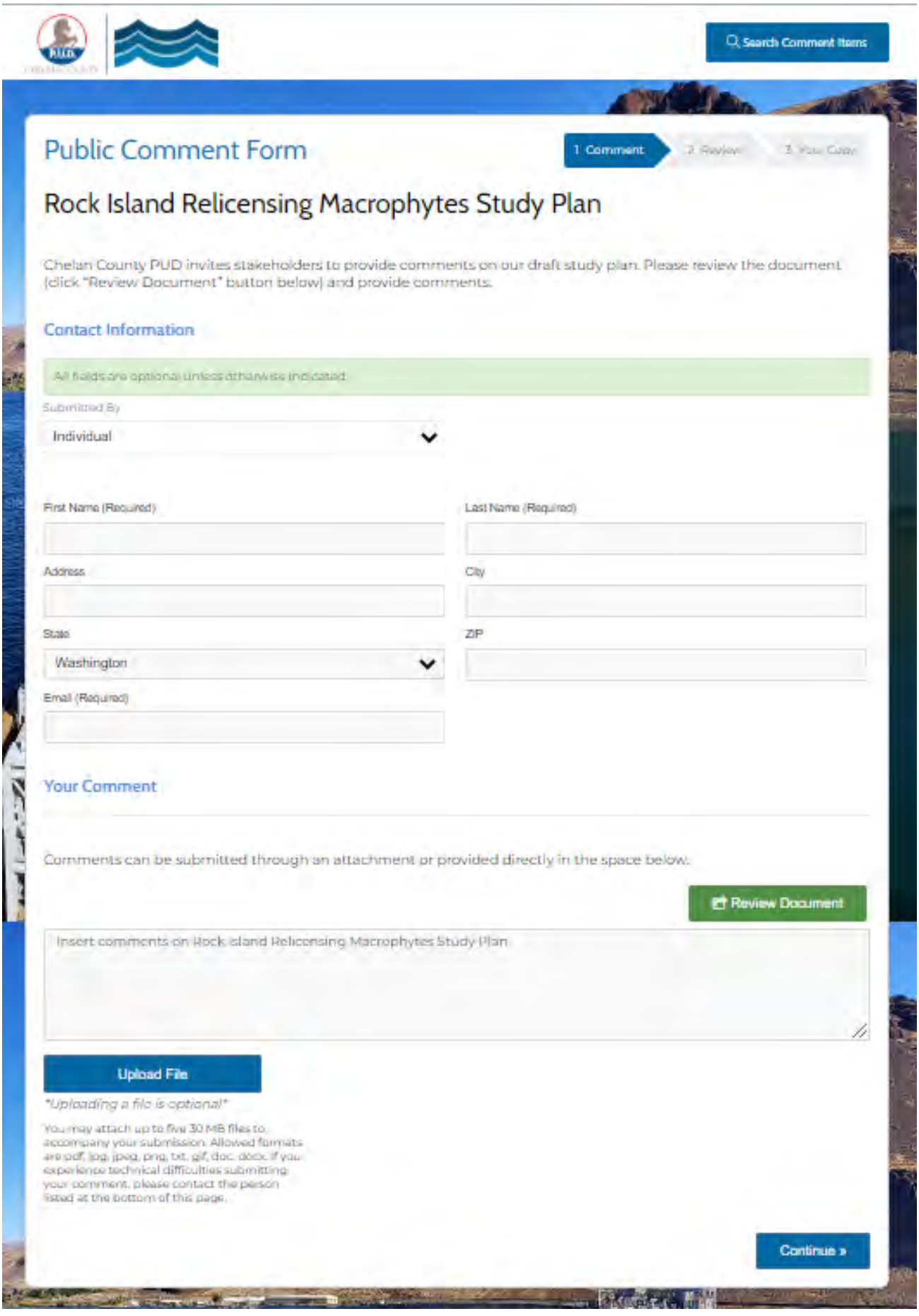
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Rock Island Relicensing Macrophytes Study Plan
Chelan County PUD invites stakeholders to provide comments on our draft study plan. Please review the document (click "Review Document" button below) and provide comments.
Contact Information
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City
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You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment, please contact the person listed at the bottom of this page.
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Kate Taylor

From: Sara Mounts <SMounts@NWCouncil.org>
Sent: Tuesday, April 11, 2023 10:08 AM
To: RIRelicensing
Subject: [External] RE: RI Relicensing Macrophytes Study Plan Draft - Comment Opportunity

Thank you for the reminder. No comment here.

Sara Mounts
NW Power and Conservation Council
WA State Office: (360) 816-1172 | www.nwcouncil.org

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Tuesday, April 11, 2023 9:50 AM
To: RIRelicensing <RIRelicensing@chelanpud.org>; 'jason@ccfeg.org' <jason@ccfeg.org>; 'murk@yakamafish-nsn.gov' <murk@yakamafish-nsn.gov>; 'bmoran@americanrivers.org' <bmoran@americanrivers.org>; 'kirk.truscott@colvilletribes.com' <kirk.truscott@colvilletribes.com>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'tracy.bowerman@ucsrb.org' <tracy.bowerman@ucsrb.org>; 'Andrew.Murdoch@dfw.wa.gov' <Andrew.Murdoch@dfw.wa.gov>; 'Patrick.Verhey@dfw.wa.gov' <Patrick.Verhey@dfw.wa.gov>; 'Nathalie.Denis@Kleinschmidtgroup.com' <Nathalie.Denis@Kleinschmidtgroup.com>; 'Sonja_Kokos@fws.gov' <Sonja_Kokos@fws.gov>; 'hare@yakamafish-nsn.gov' <hare@yakamafish-nsn.gov>; 'kai.steimle@kleinschmidtgroup.com' <kai.steimle@kleinschmidtgroup.com>; 'andrew.fielding@parks.wa.gov' <andrew.fielding@parks.wa.gov>; Alene Underwood <Alene.Underwood@chelanpud.org>; 'Audrey.Thompson@kleinschmidtgroup.com' <Audrey.Thompson@kleinschmidtgroup.com>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; Bill Towey <bill.towey@chelanpud.org>; 'rogb@yakamafish-nsn.gov' <rogb@yakamafish-nsn.gov>; 'brenthall@ctuir.org' <brenthall@ctuir.org>; Brian Odell <brian.odell@chelanpud.org>; Catherine Willard <Catherine.Willard@chelanpud.org>; 'chad.jackson@dfw.wa.gov' <chad.jackson@dfw.wa.gov>; 'Chelsea.Harris@parks.wa.gov' <Chelsea.Harris@parks.wa.gov>; 'cindy.preston@dnr.wa.gov' <cindy.preston@dnr.wa.gov>; 'dave.burgess@dfw.wa.gov' <dave.burgess@dfw.wa.gov>; 'blod@yakamafish-nsn.gov' <blod@yakamafish-nsn.gov>; 'mild@yakamafish-nsn.gov' <mild@yakamafish-nsn.gov>; 'James.Huinker@dnr.wa.gov' <James.Huinker@dnr.wa.gov>; 'keith.hatch@indianaffairs.gov' <keith.hatch@indianaffairs.gov>; Lance Keller <Lance.Keller@chelanpud.org>; 'laura.heironimus@dfw.wa.gov' <laura.heironimus@dfw.wa.gov>; 'marylouise.keefe@kleinschmidtgroup.com' <marylouise.keefe@kleinschmidtgroup.com>; 'lamr@yakamafish-nsn.gov' <lamr@yakamafish-nsn.gov>; 'RD_Nelle@fws.gov' <RD_Nelle@fws.gov>; Scott Hopkins <Scott.Hopkins@chelanpud.org>; Stacy Horton <SHorton@NWCouncil.org>; 'sghays51@msn.com' <sghays51@msn.com>; 'ivet@yakamafish-nsn.gov' <ivet@yakamafish-nsn.gov>; 'william_gale@fws.gov' <william_gale@fws.gov>; 'judy_neibauer@fws.gov' <judy_neibauer@fws.gov>; 'jason.mclellan@colvilletribes.com' <jason.mclellan@colvilletribes.com>; 'bret.nine@colvilletribes.com' <bret.nine@colvilletribes.com>; 'aaronjackson@ctuir.org' <aaronjackson@ctuir.org>; 'justin.yeager@noaa.gov' <justin.yeager@noaa.gov>; 'porl@critfc.org' <porl@critfc.org>; 'Casey.Baldwin@colvilletribes.com' <Casey.Baldwin@colvilletribes.com>; 'Douglas.Marconi@colvilletribes.com' <Douglas.Marconi@colvilletribes.com>; 'scott.carlon@noaa.gov' <scott.carlon@noaa.gov>; 'mape461@ecy.wa.gov' <mape461@ecy.wa.gov>; 'skit@critfc.org' <skit@critfc.org>; 'pmugunthan@fourpeaksenv.com' <pmugunthan@fourpeaksenv.com>; 'ghoff@usbr.gov' <ghoff@usbr.gov>; 'cwright@lgl.com' <cwright@lgl.com>; 'drobichaud@lgl.com' <drobichaud@lgl.com>; 'AudieHuber@ctuir.org' <AudieHuber@ctuir.org>; 'jmiller@fourpeaksenv.com' <jmiller@fourpeaksenv.com>; Sara Mounts <SMounts@NWCouncil.org>;

MACROPHYTES STUDY REPORT

ROCK ISLAND HYDROELECTRIC PROJECT

FERC NO. 943

Source: EAS (2023)

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY

327 N. WENATCHEE AVENUE

WENATCHEE, WA 98801

November 2023

MACROPHYTES STUDY REPORT

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

EAS ENVIRONMENTAL ASSESSMENT SERVICES

November 2023

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TERMS AND ABBREVIATIONS

B	
BRZ	boat restricted zone
C	
Chelan PUD	Public Utility District No. 1 of Chelan County
CIR	color infrared
F	
FERC	Federal Energy Regulatory Commission
G	
GIS	geographic information system
GPS	global positioning system
I	
ILP	Integrated Licensing Process
R	
RM	river mile
Rock Island Project	Rock Island Hydroelectric Project FERC No. 943

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission (FERC) Project No. 943) (Rock Island Project). The Rock Island Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Rock Island Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Rock Island Project, which will utilize the Integrated Licensing Process (ILP). Chelan PUD intends to incorporate the findings of this report into the Pre-Application Document, which will be filed with FERC and distributed to relicensing participants when the ILP commences in late 2023.

A macrophytes study was conducted in support of the Rock Island Project relicensing, as described in the Macrophytes Study Plan (EAS 2023). This report presents findings from survey efforts conducted in 2023.

1.1 Existing Information and Need for Additional Information

There is little available information about the location and species composition of macrophyte beds in the Rock Island Reservoir. Macrophyte surveys were conducted in the Rock Island Reservoir from 1984 through 1990 (Chelan PUD 1990). The goal of these surveys was to identify the species of macrophytes present and estimate species composition of macrophyte beds. Chelan PUD is not aware of any additional macrophyte surveys conducted in the Rock Island Reservoir between 1991-2023.

In 1990, surveys conducted in the Rock Island Reservoir documented 218 acres of macrophyte beds (Chelan PUD 1990). Species documented included Eurasian watermilfoil (*Myriophyllum spicatum*), curly leaf pondweed (*Potamogeton crispus*), small pondweed (*Potamogeton pusillus*), and common waterweed (*Elodea canadensis*).

Recent surveys conducted in the Rocky Reach Reservoir, upstream of the Rock Island Reservoir, documented the presence of native macrophyte species including common waterweed, coontail (*Ceratophyllum demersum*), water stargrass *(Heteranthera dubia*), white-stemmed pondweed (*Potamogeton praelongus*), flat-stem pondweed *(Potamogeton zosteriformis*), and invasive species such as Eurasian watermilfoil, curly leaf pondweed, and flowering rush (*Butomus umbellatus*; Chelan PUD 2021a and 2023).

Flowering rush is an invasive species of special concern in Washington and is known to occur in the upper Columbia River watershed (WISC 2017). Flowering rush spreads easily on water currents, and if left uncontrolled, can outcompete native aquatic plants, leading to reduced biodiversity and the creation of unsuitable food, shelter, and nesting habitat for native animals. Moreover, flowering rush can hinder recreational activities and has the potential to clog irrigation canals.

2.0 STUDY GOALS AND OBJECTIVES

The goal of this study was to characterize the distribution and species composition of macrophyte beds in the Rock Island Reservoir.

This study was based on the issue statement developed by the Technical Working Group during early engagement, which states:

"*Limited aquatic macrophyte data are available on the mainstem Columbia River within the Rock Island Project to support certification of Project operations' compliance with water quality standards.*"

The objective of the macrophyte study was to locate and map the presence of macrophyte beds throughout the Rock Island Reservoir and to record the dominant and subdominant macrophyte species found in each bed. Additionally, this study aimed to document whether flowering rush was present in the Rock Island Reservoir.

3.0 STUDY AREA

The Rock Island Project is located near the cities of Wenatchee and East Wenatchee in Chelan County and Douglas County, Washington, on the Columbia River from river mile (RM) 453.4 to RM 473.7. The Study Area encompasses the Rock Island Reservoir, as depicted in Figure 3-1. The Study Area includes the boat restricted zone (BRZ) in the forebay of Rock Island Dam, however field surveys were not conducted in the BRZ due to safety concerns.

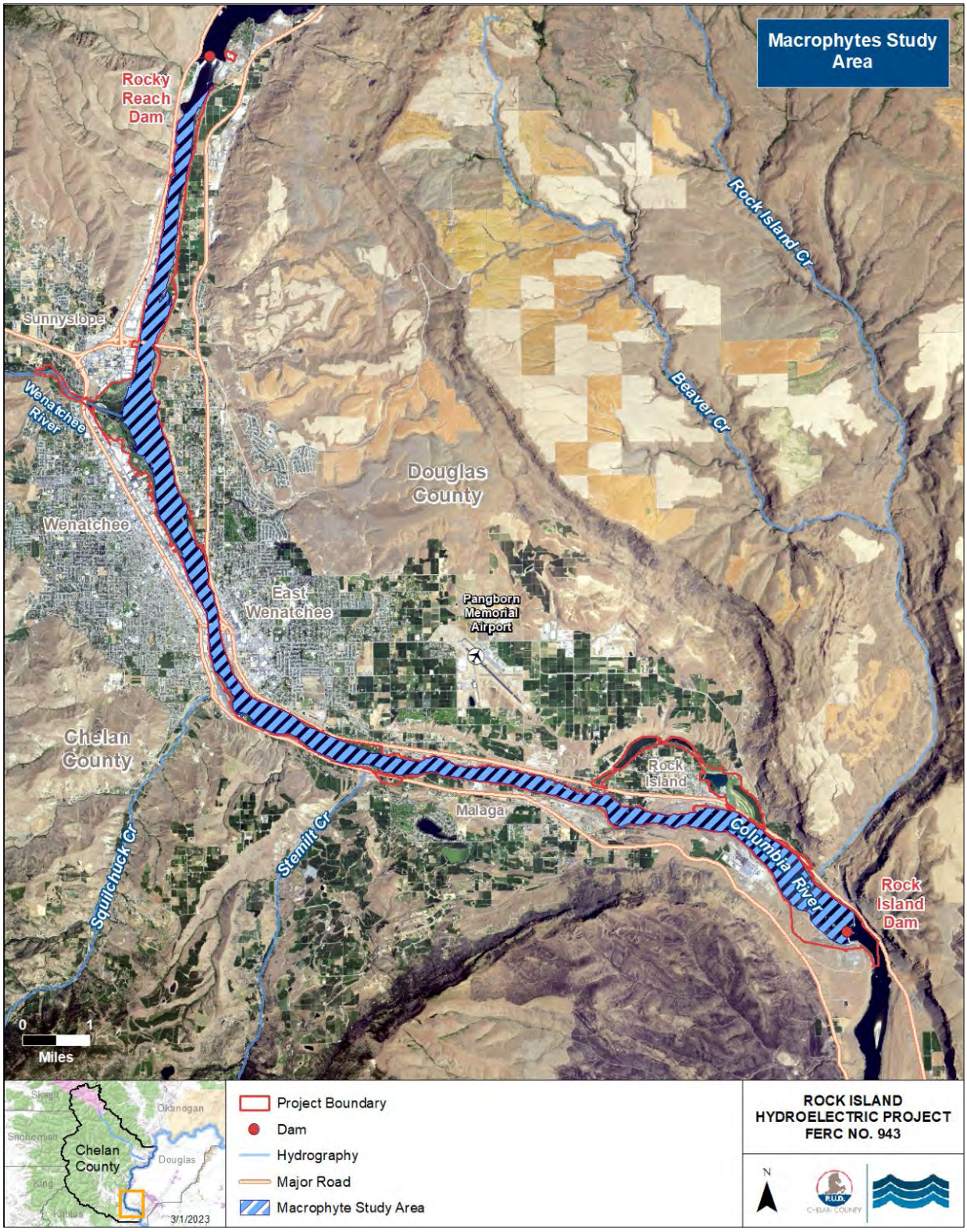


Figure 3-1 Macrophytes Study Area

4.0 METHODS

The study design included three major steps: a desktop review/interpretation, field surveys, and post-survey analysis.

4.1 Desktop Review and Interpretation

Existing maps, orthoimagery, and bathymetry data were analyzed within a geographic information system (GIS) framework (ArcMap 10.8.1, ESRI, Redlands, CA) to determine areas likely to contain macrophyte beds. Four different orthoimagery layers from the Hexagon Content Program Streaming Aerial Imagery Service (Hexagon AB, Stockholm, Sweden) were used to identify macrophyte beds. These layers included a color composite group layer, a color infrared (CIR) layer, a 2018 CIR 15 cm urban layer, and a 2016 CIR 15 cm urban layer. A 5-foot bathymetry layer (NHC 2022) and a shoreline layer (Chelan PUD 2021b) were also used to identify macrophyte bed boundaries. Macrophyte beds visible in orthoimagery were digitized using GIS (Marshall and Lee 1994). In high-quality color orthoimagery, areas containing macrophytes were seen as darker patches of water, whereas high-quality CIR orthoimagery showed areas containing macrophytes as a light pink. In ArcMap, a GIS layer was created by drawing polygons around the boundaries of suspected macrophyte beds based on orthoimagery. The polygon layer was transferred to Trimble global positioning system (GPS) units and served as a foundational layer for establishing initial points which could then be verified in the field.

4.2 Field Surveys

Field surveys were conducted in August 2023 to ensure they occurred during a phase in the growth cycle when macrophytes were typically more discernable. This period usually falls between July and September (DiFranco 2019). Over a five-day period, two teams of experienced biologists conducted site visits and surveys. Their objective was to validate or adjust the digitized macrophyte bed polygons and map any macrophyte beds that were not identified during the desktop review.

Each team operated a 19- to 25-foot motorboat. Inflatable kayaks (Photo 4-1) were used in areas unreachable by the larger vessels. Survey vessels traveled at a speed of approximately 3 miles per hour. Surveyors assessed the previously digitized areas as well as any areas where macrophytes were not visible on orthoimagery. When a macrophyte bed was identified, surveyors navigated along the edge of the deepest visible extent of the macrophyte bed to assess the accuracy of the digitized areas. Any changes based on visual observations were recorded using a sub-meter accuracy Trimble GPS unit (Berg 2016). Areas between the outer edge and the shoreline that did

not contain macrophytes were also recorded and removed from the final macrophyte bed polygon. Using polarized sunglasses, surveyors could reliably detect macrophytes at depths usually ranging from 10 to 15 feet. This range depended on environmental factors such as water clarity, wave action, and the angle of the sun on the water surface. Surveyors visually assessed the dominant and sub-dominant macrophyte species within 60-foot transects across the macrophyte beds. Dominance was indicated by high relative abundance of a species within a macrophyte bed when compared to other present species and co-dominance (or tri-dominance) could occur when multiple species had similarly high relative abundance. Surveyors documented all the species observed within each distinct bed, with special attention given to the detection of flowering rush. A grappling hook was used to collect macrophytes when species identification was not easily determined from the vessels. These survey methods were consistent with those used at the Rocky Reach Reservoir (Chelan PUD 2021a).

Source: EAS 2023

Photo 4-1 Mapping Macrophyte Beds Using Kayaks Near Confluence State Park

4.3 Post-Survey Analysis

Analysts imported the recorded Trimble GPS data into ArcGIS and entered all field data into a digital database. Macrophyte bed polygons identified during the desktop review were modified

based on geospatial data collected during field surveys to create final macrophyte bed polygons. This finalized GIS layer displays the locations of the macrophyte beds (Appendix A) and was used to calculate the total acreage of macrophyte beds present in the reservoir. The digital database contains a record of the acreage covered for each macrophyte bed, the dominant macrophyte species, and any other macrophyte species observed (Appendix B).

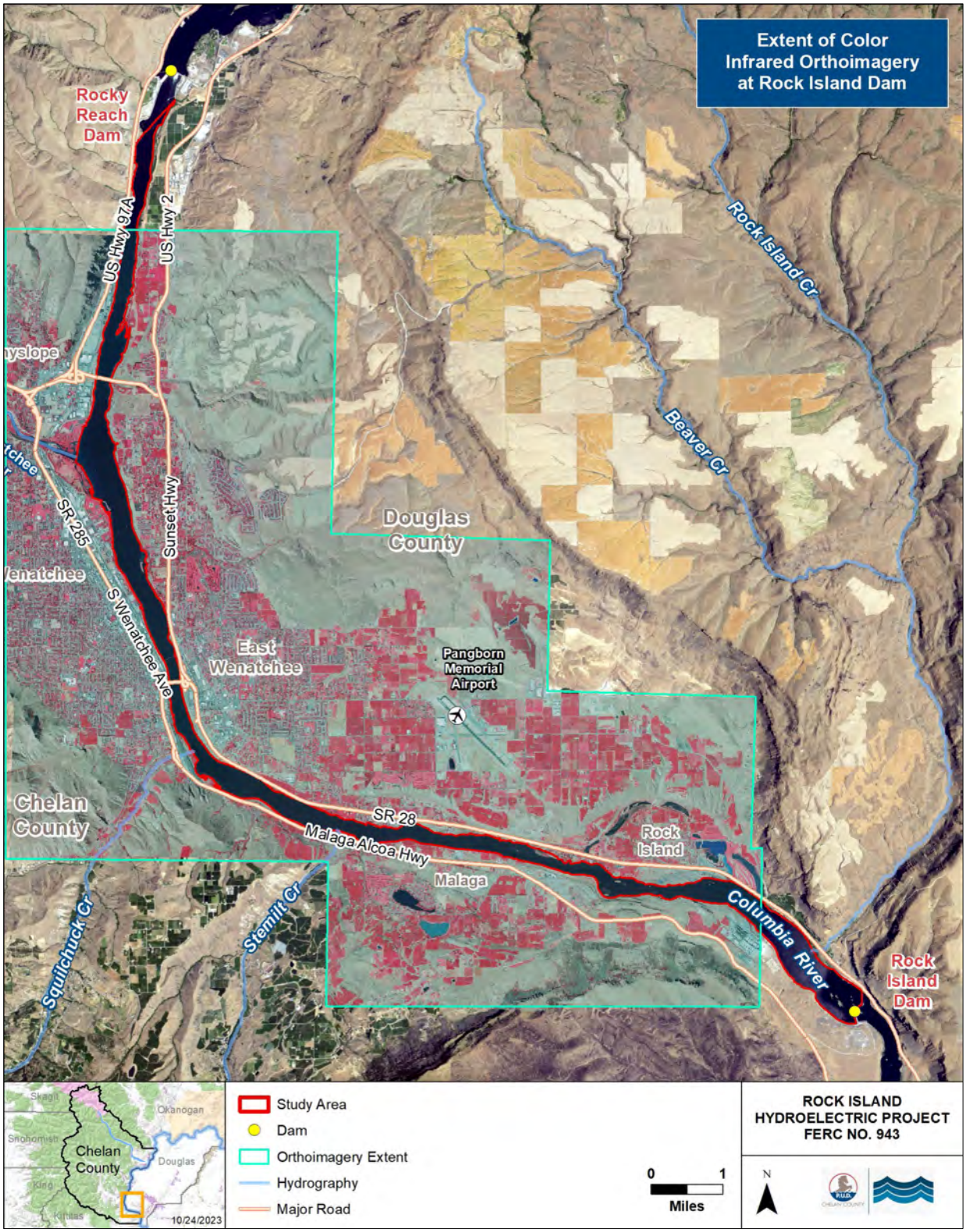
5.0 RESULTS

5.1 Desktop Review and Interpretation

The CIR orthoimagery proved to be the most informative when identifying macrophyte beds as plants, even underwater, appear light pink to red in color. However, there were noticeable differences in size and extent of beds identified using orthoimagery compared to what was found in the field. Several factors contributed to these discrepancies, including the coverage of CIR orthoimagery (Figure 5-1), false positives originating from other organisms, and variations in the timing of orthoimagery data collection, both on a daily and seasonal basis.

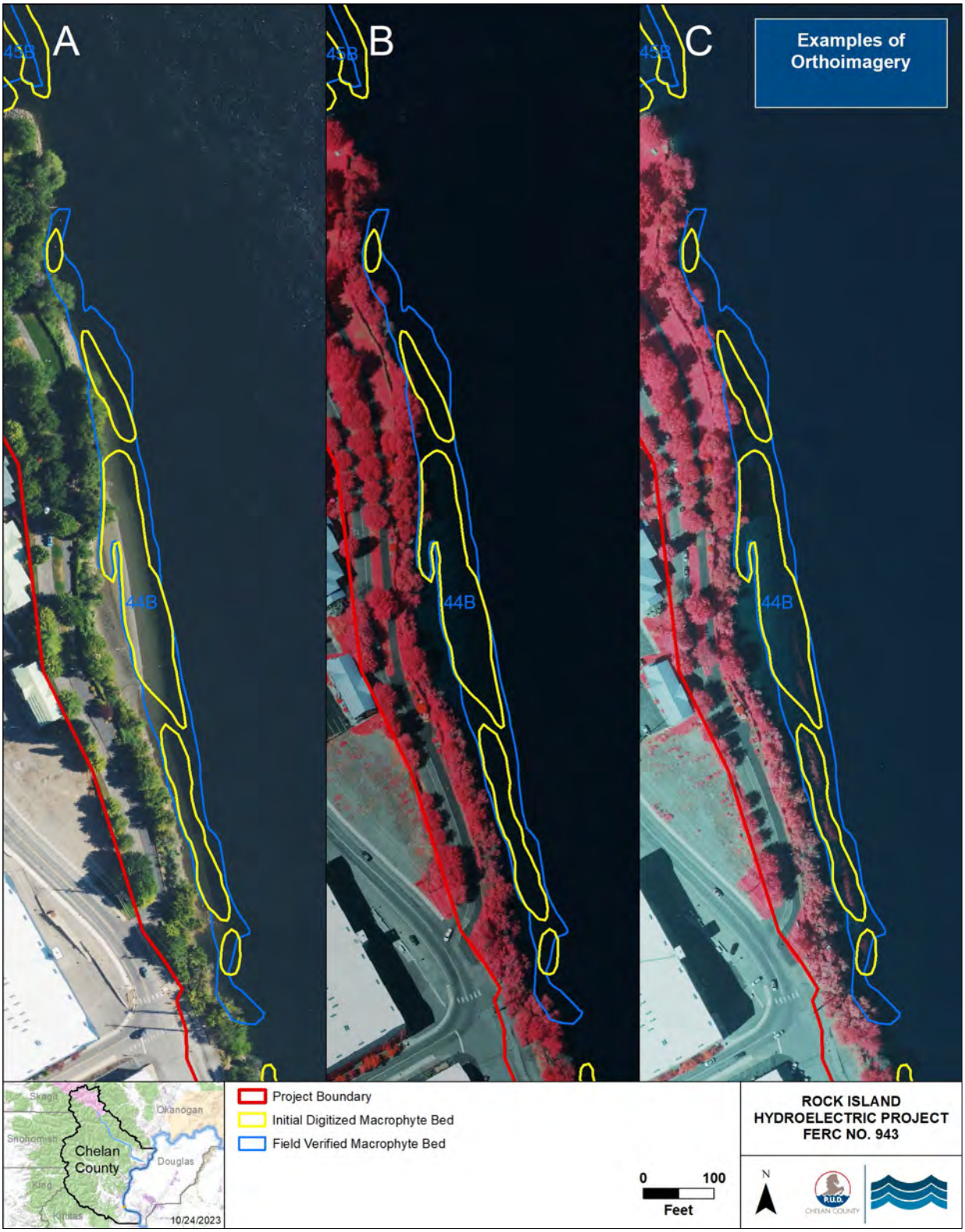
The 2016 and 2018 CIR orthoimagery layers were not as extensive as the color composite group layer, with the CIR layer extent ending 1.9 miles (3 km) downstream of the tailrace of Rocky Reach Dam and ending 1.2 miles (2 km) upstream of the BRZ for Rock Island Dam. Seven macrophyte beds were found in the field that were outside the limits of the 2016 CIR layer and not visible on the composite layer. False positives occurred in shallow water with the presence of either green or brown algae. Orthoimagery was also affected by the time of year and day it was collected (Figure 5-2). For example, it was harder to detect macrophyte beds using the Hexagon composite layer due to its darker appearance and elongated shadows. This could also be attributed to the imagery being captured later in the day or even a different season than when the surveys were conducted. The 2018 CIR orthoimagery was also darker, and macrophyte beds were not easily identified.

The 2016 CIR orthoimagery emerged as the most optimal imagery, featuring shadows of moderate size. It is conceivable that this imagery was captured during midday when the sun was overhead, as it displayed good water clarity, revealing certain rock formations devoid of vegetation. Discrepancies may have also arisen from seasonal or even annual differences in the timing of orthoimagery collection compared to the timing of field survey activities. This is evident in cases where some beds were considerably larger than what the imagery depicted. Initially, the total area estimated for macrophyte beds from the desktop review encompassed 207.22 acres, whereas the final field-verified macrophyte beds covered 380.25 acres (Table 5-1), representing an 84 percent increase.



Note: This figure shows the extent of the 2016 and 2018 CIR orthoimagery layers which started 1.9 miles (3 km) downstream of the BRZ from the Rocky Reach Dam and ended 1.2 miles (2 km) upstream from the Rock Island Dam.

Figure 5-1 Extent of Color Infrared Orthoimagery



Note: Examples of three orthoimagery layers used to create initial digitized beds including color composite group layer (A), 2018 CIR 15 cm urban layer (B), and 2016 CIR 15cm urban layer (C).

Figure 5-2 Examples of Orthoimagery Used

5.2 Field Survey Results

A total of 166 macrophyte beds were identified during the 2023 field efforts (Table 5-1). The total area of macrophyte beds encompassed 380.25 acres within the Study Area which equates to 18.9 acres per RM (Table 5-1). The average macrophyte bed was 2.3 acres (standard deviation = 6.2, range 0.01 to 43.49). The ten largest macrophyte beds ranged in size from 9.80 to 43.49 acres, occurred on the leeward side of a river bend, and tended to be longer than they were wide (Figure 5-3). Maps showing each documented macrophyte bed are found in Appendix A.

Table 5-1 Macrophytes Field Survey Results

	MYSP[a]	ELCA	POCR[a]	CEDE	POPR	HEDU	POZO	PONO	TOTAL
# of Beds Present	164	142	83	37	35	33	10	1	166
% Present	99	86	50	22	21	20	6	1	N/A
# of Beds Dominant	107	60	19	4	2	3	0	0	N/A[b]
% Dominant	64	36	11	2	1	2	0	0	N/A

[a]Invasive species.

[b]Each bed could contain more than one dominant species resulting in the total number of dominant beds exceeding the total number of beds present.

Note: MYSP = Eurasian watermilfoil; ELCA = common waterweed; POCR = curly leaf pondweed; CEDE = coontail; POPR = white-stemmed pondweed; HEDU = water stargrass; POZO = flat-stem pondweed; and PONO = longleaf pondweed.

The most commonly recorded invasive species were Eurasian watermilfoil and curly leaf pondweed, present in 98.80 percent and 50.00 percent, respectively, of the total number of macrophyte beds. The native common waterweed was present in 85.54 percent of the total number of macrophyte beds.

Eurasian watermilfoil occurred as the dominant species in 64.46 percent of the total macrophyte beds, while common waterweed occurred as the dominant species in 36.14 percent of the total macrophyte beds (Table 5-1).

Most beds had a single dominant species; however, co-dominance (or tri-dominance) could occur when multiple species had similarly high relative abundance in a macrophyte bed, resulting in the sum of dominant bed percentages equaling over 100 percent. For macrophyte beds with co-dominant species, the most common pairing was Eurasian watermilfoil and common waterweed, which were co-dominant (or tri-dominant with a third species) in 14 of the beds. Other native species including coontail, water stargrass, and white-stemmed pondweed also occurred in mostly larger macrophyte beds. Coontail, white-stemmed pondweed, and water star-grass were more commonly present in macrophyte beds (22 percent, 21 percent, and 20 percent of the total

number of macrophyte beds, respectively) than dominant in macrophyte beds (2 percent, 1 percent, and 2 percent of the total macrophyte beds, respectively; Table 5-1). Flat-stem pondweed was found in ten (6 percent) of the macrophyte beds while longleaf pondweed was observed in only one (< 1 percent) macrophyte bed and neither was dominant in any macrophyte bed they were present in. A full list of species present in each macrophyte bed is presented in Appendix B.

Macrophyte species richness tended to be higher in larger macrophyte beds. Seven species were observed in two beds with an average area of 22.9 acres while six species were observed in six different beds with an average area of 14.8 acres. Macrophyte beds with two or three species were most common, with an average area of 0.4 and 0.8 acres, respectively (Table 5-2).

Table 5-2 Macrophyte Bed Species Richness

NUMBER OF SPECIES	AVERAGE ACRES	MINIMUM ACRES	MAXIMUM ACRES	NUMBER OF BEDS
7	22.9	2.38	43.49	2
6	14.8	0.17	36.76	6
5	4.4	0.05	18.66	20
4	3.7	0.05	40.92	27
3	0.8	0.01	6.18	41
2	0.4	0.01	1.57	54
1	0.3	0.04	1.20	16

Note: Summary of species richness in each bed from field surveys conducted in 2023. Beds were grouped by the number of species found in each bed and an average, minimum, and maximum acreage was calculated for each group. Number of Beds represents the count of beds for each group.

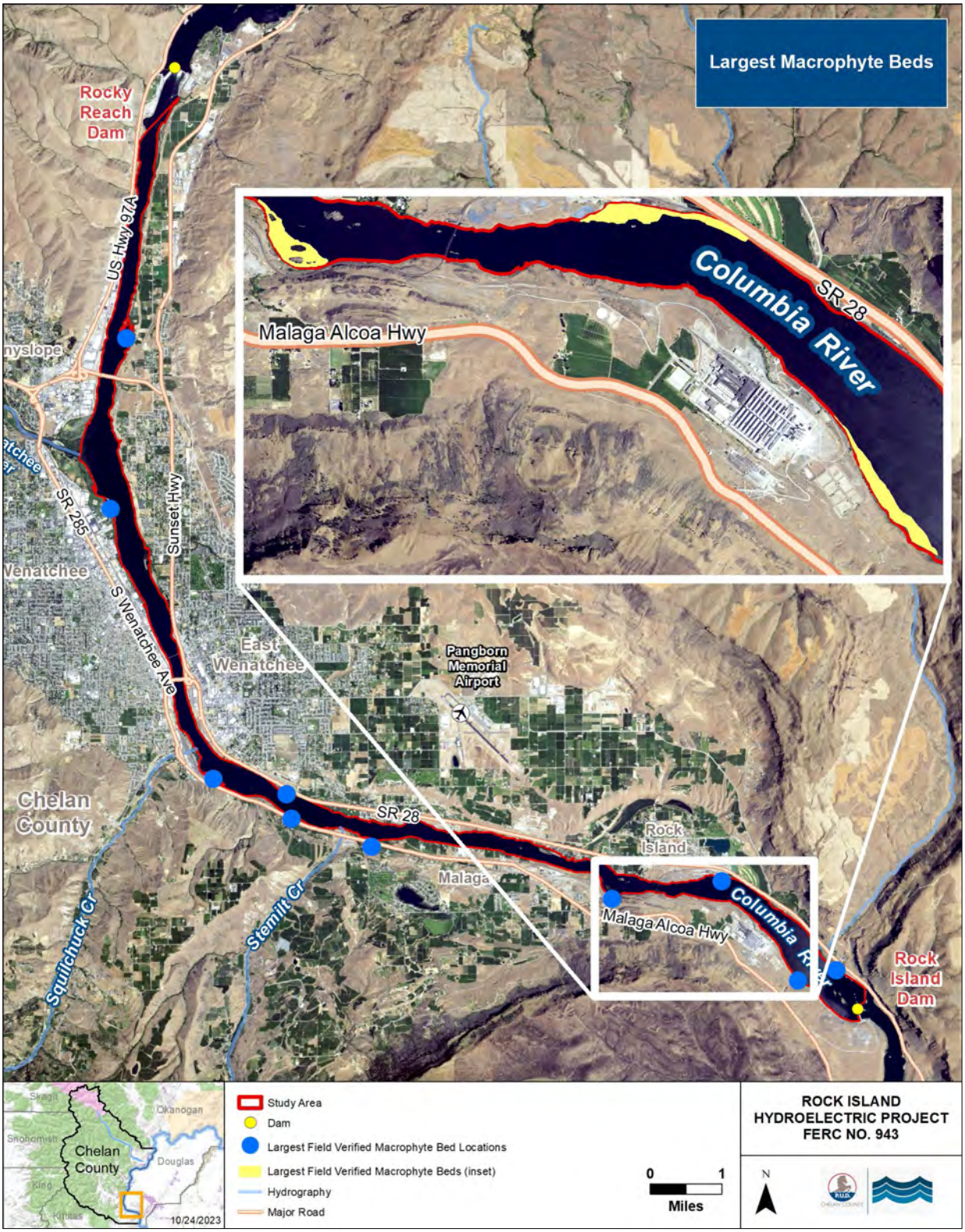


Figure 5-3 Locations of the Ten Largest Macrophyte Beds, with Inset Map Showing Examples of Beds occurring on Leeward side of River Bends

5.3 Flowering Rush Surveys

Flowering rush surveys were conducted along the outer perimeter of macrophyte beds during the field surveys. After field verification of digitized macrophyte beds was concluded, macrophyte beds where species identification of the whole bed was not possible from the perimeter, were surveyed in their entirety for flowering rush. Although cattail (*Typha latifolia*) and bulrush (*Scirpus spp*.) were found along the shorelines, no flowering rush was observed during any survey efforts.

6.0 CONCLUSION

Due to the lack of recent macrophyte data, surveys were conducted to better understand the geographic distribution and species composition of macrophyte beds in the Rock Island Reservoir. Data gathered in this study offer a comprehensive representation of the existing macrophyte beds within the Rock Island Reservoir.

6.1 Survey Results

The survey results show that two invasive species, Eurasian watermilfoil, and curly leaf pondweed, and one native species, common waterweed, occur as the three most commonly present species, while Eurasian watermilfoil and common waterweed were the most dominant species within the macrophyte beds. Common waterweed was prevalent among the macrophyte beds, however of all the observed macrophyte species common waterweed is more likely to be underrepresented in dominance assessments. This is primarily due to its low growing structure, which makes it less visible within dense beds and deeper waters. Three native species, coontail, water stargrass, and white-stemmed pondweed, were found in approximately 20 percent of the macrophyte beds. However, they only held dominance in a limited number of smaller macrophyte beds. No invasive flowering rush was detected during the surveys, indicating that it has not become an established species in the Rock Island Reservoir.

The majority of the documented macrophyte beds can be characterized as long and narrow, with the entire width of the bed typically within the surveyors' visibility. These elongated beds primarily consisted of Eurasian watermilfoil and common waterweed. The most substantial macrophyte beds were located in leeward bends of the river and often occupied the majority of the calm water downstream from these bends. These larger beds also exhibited the highest species richness, with some containing up to seven different macrophyte species.

6.2 Comparisons to Historical Surveys

The composition of invasive species within macrophyte beds, particularly Eurasian watermilfoil, has undergone significant changes since 1984. In 1984, Eurasian watermilfoil was present in just 6 percent of the macrophyte beds in the Rock Island Reservoir. By 1990, Eurasian watermilfoil was present in 57 percent of these beds, with a decreasing trend in presence observed from upstream beds to downstream beds (Chelan PUD 1990). In 2023, this figure rose to nearly 99 percent, signifying a continued increase in the prevalence of Eurasian watermilfoil within macrophyte beds.

Two other native species, fennel-leaf pondweed (*Potamogeton pectinatus*) and Richardson's pondweed (*Potamogeton richardsonii*) were observed incidentally between 1984 and 1990

(Chelan PUD 1990) but were not observed in 2023. Richardson's pondweed is very similar to curly leaf pondweed with wavy leaf margins. The key features that set Richardson's pondweed apart are its smooth leaf margins and pointed leaf tips, whereas curly leaf pondweed is identified by its serrated leaf edges and rounded leaf tips. Although there is a chance that an incidental species was missed during the 2023 surveys, there is also a possibility that native species incidentally observed 33 years ago were originally misidentified or have disappeared from the area.

7.0 REFERENCES

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APPENDIX A Map Locations of Macrophyte Beds by River Mile

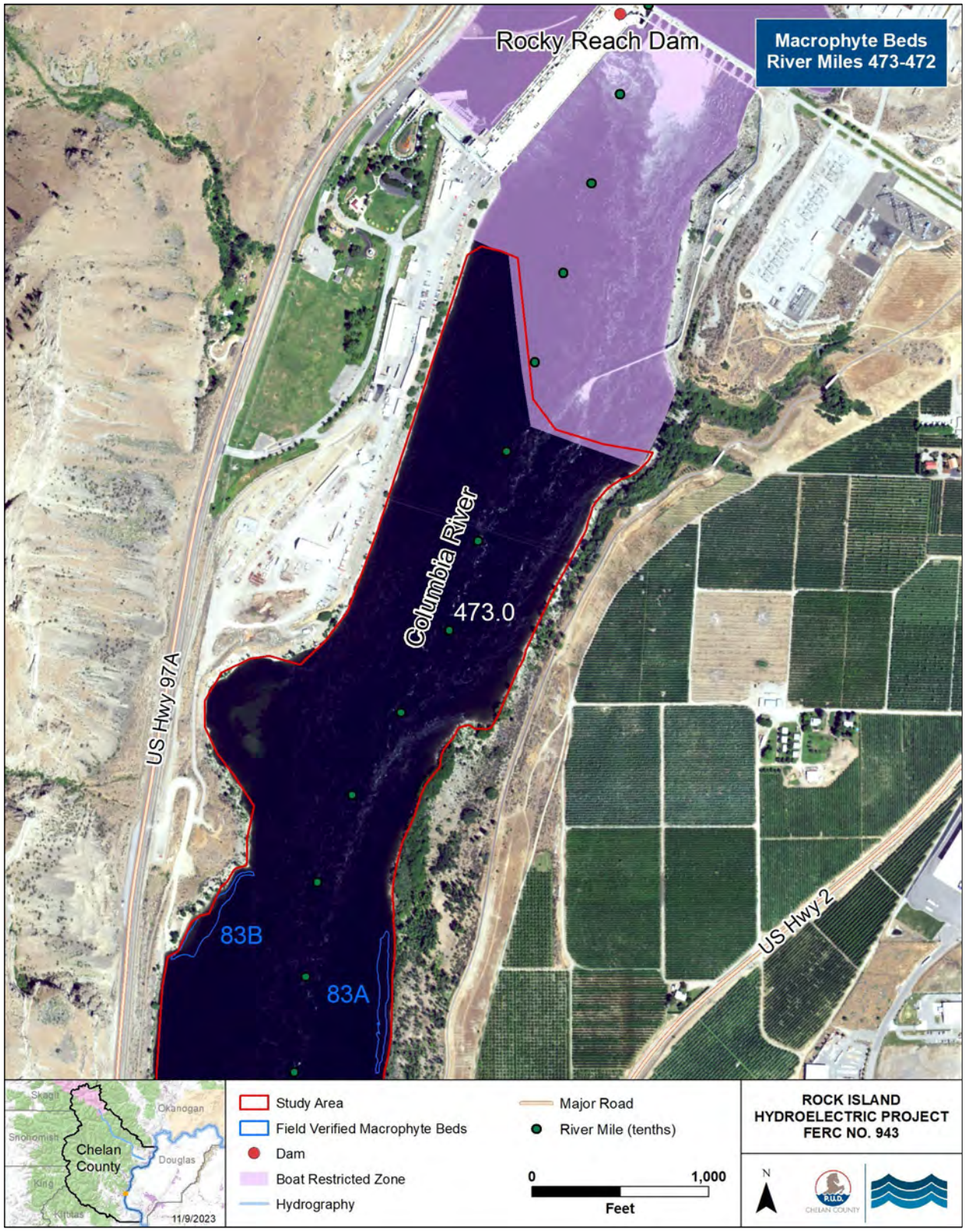


Figure A- 1 Macrophyte Beds at River Miles 473-472

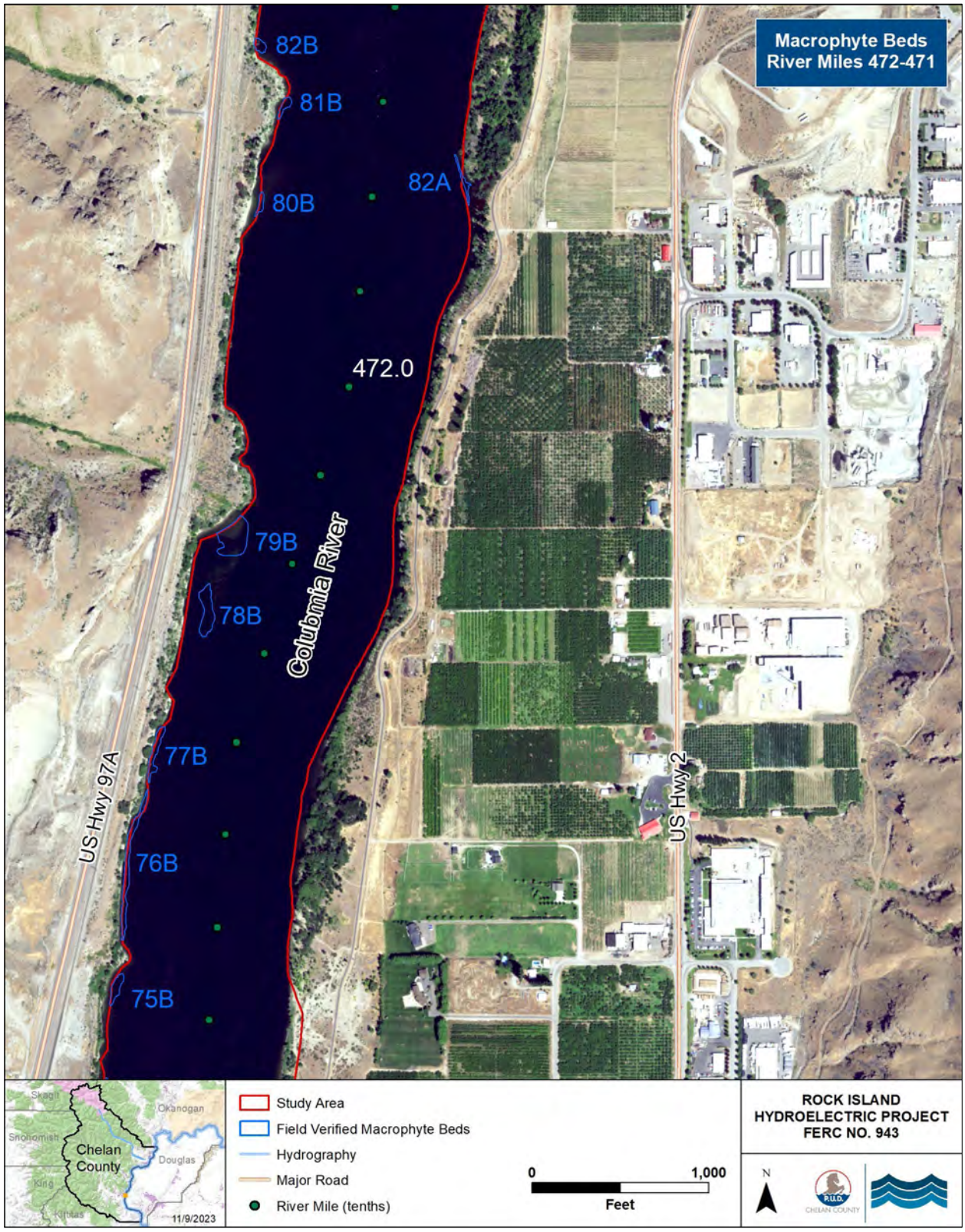


Figure A- 2 Macrophyte Beds at River Miles 472-471

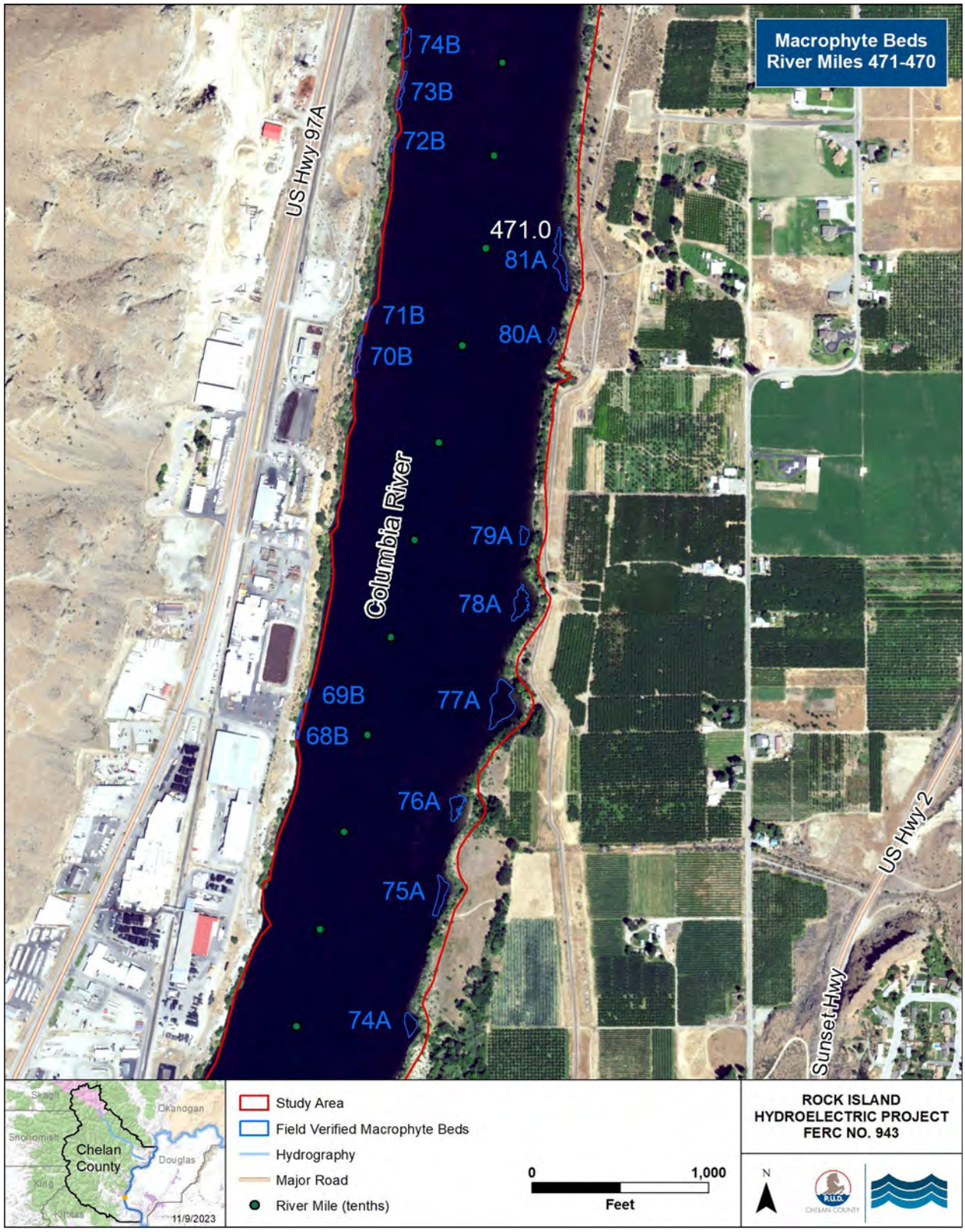


Figure A- 3 Macrophyte Beds at River Miles 471-470

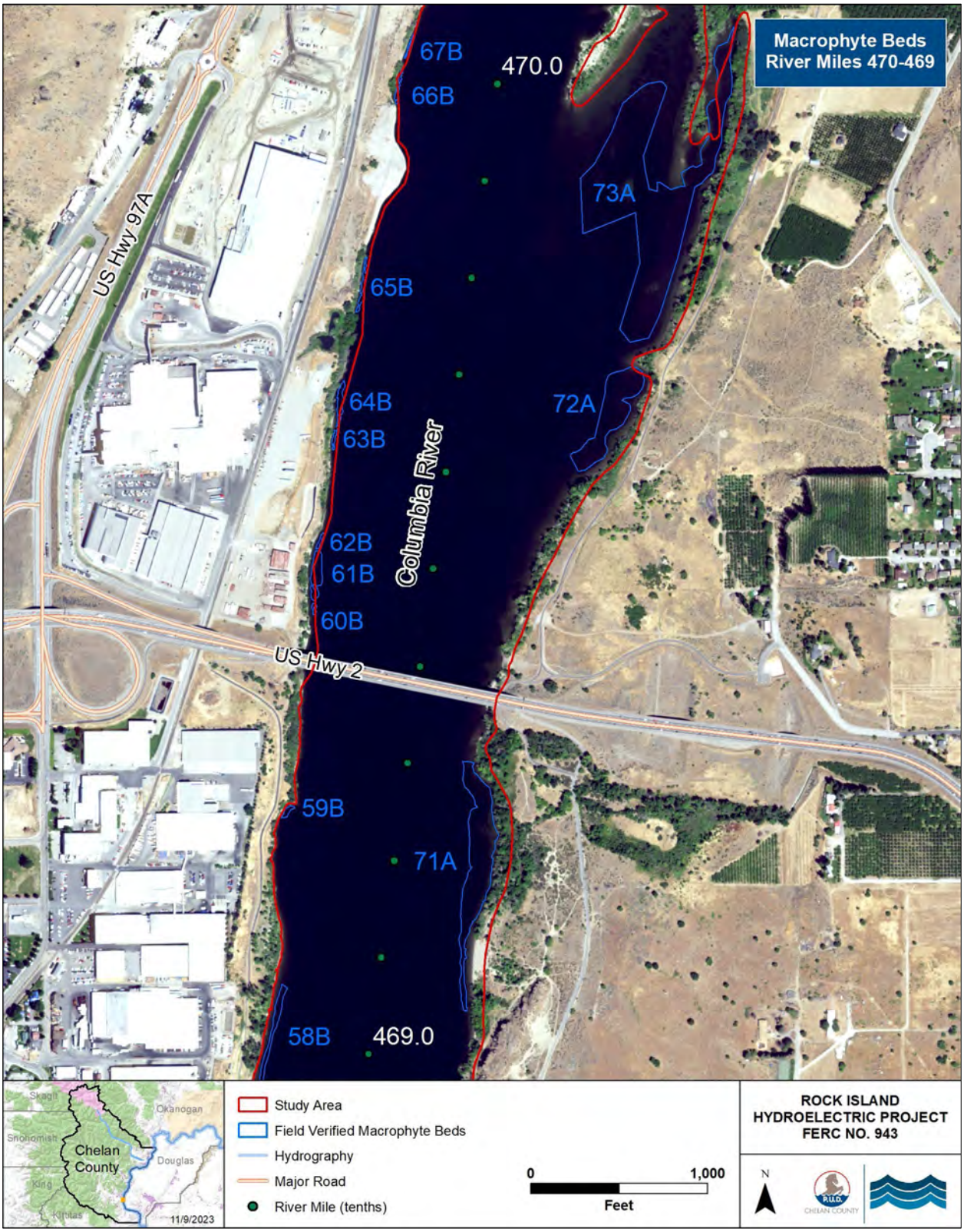


Figure A- 4 Macrophyte Beds at River Miles 470-469

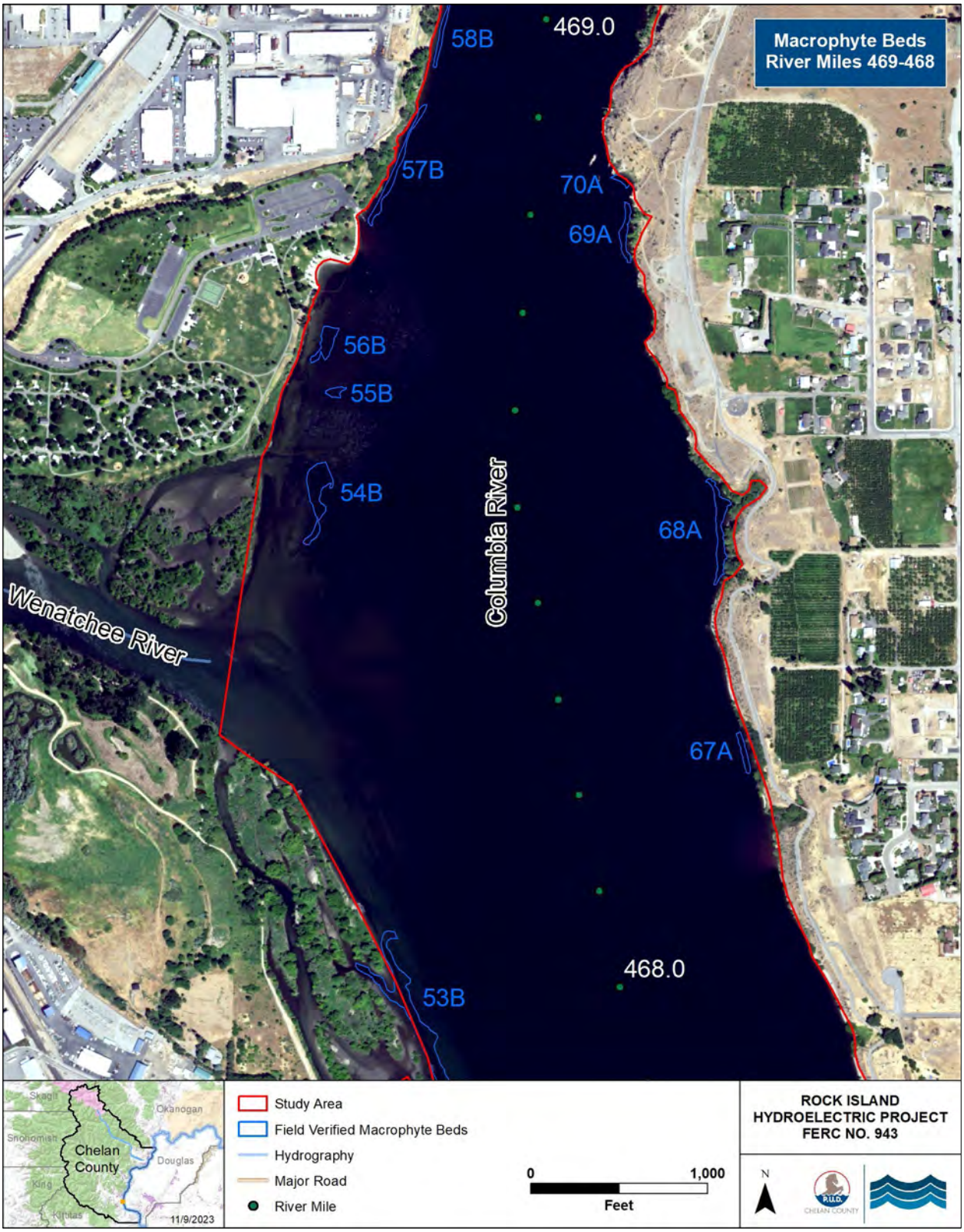


Figure A- 5 Macrophyte Beds at River Miles 469-468

Figure A- 6 Macrophyte Beds at River Miles 468-467

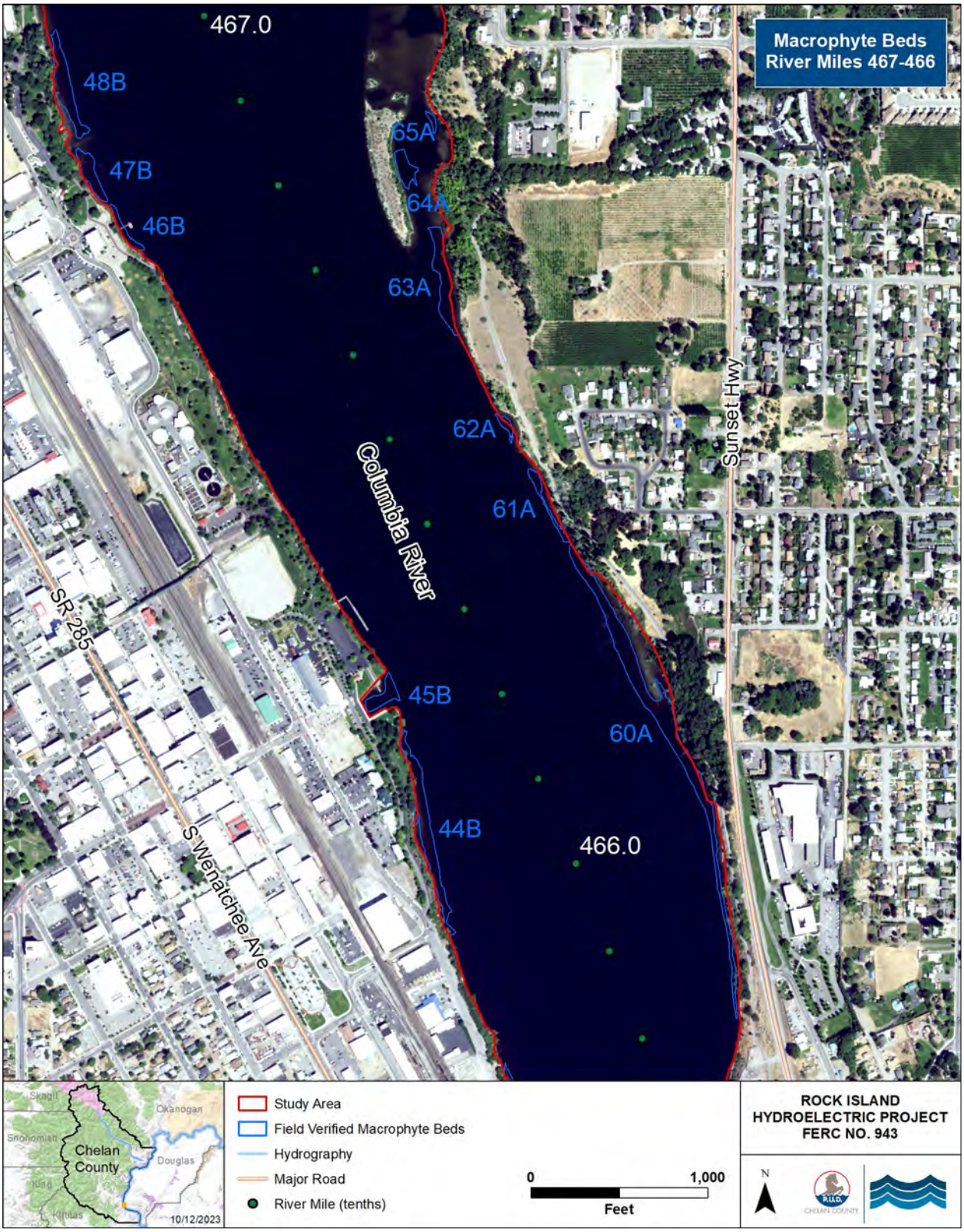


Figure A- 7 Macrophyte Beds at River Miles 467-466

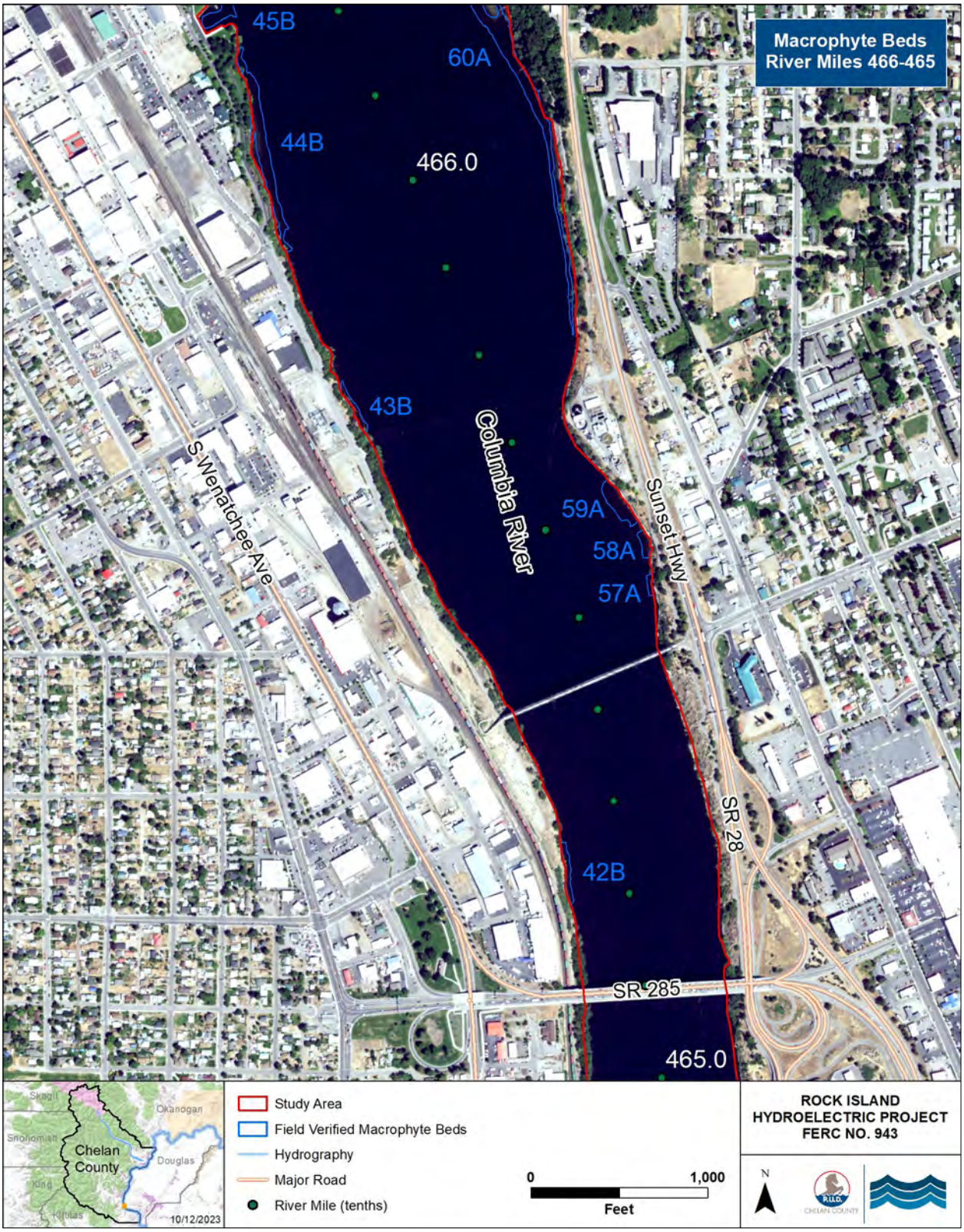


Figure A- 8 Macrophyte Beds at River Miles 466-465

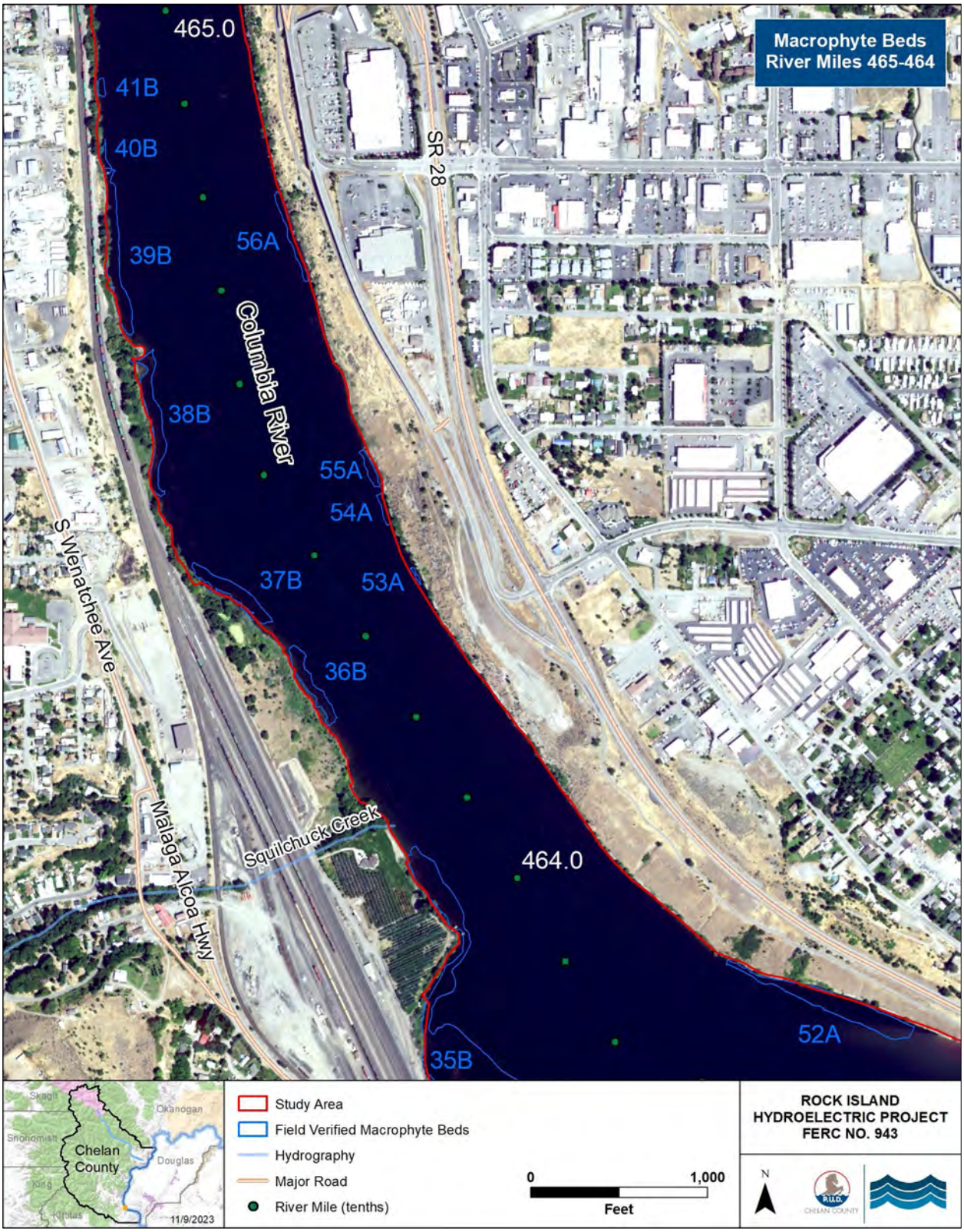


Figure A- 9 Macrophyte Beds at River Miles 465-464

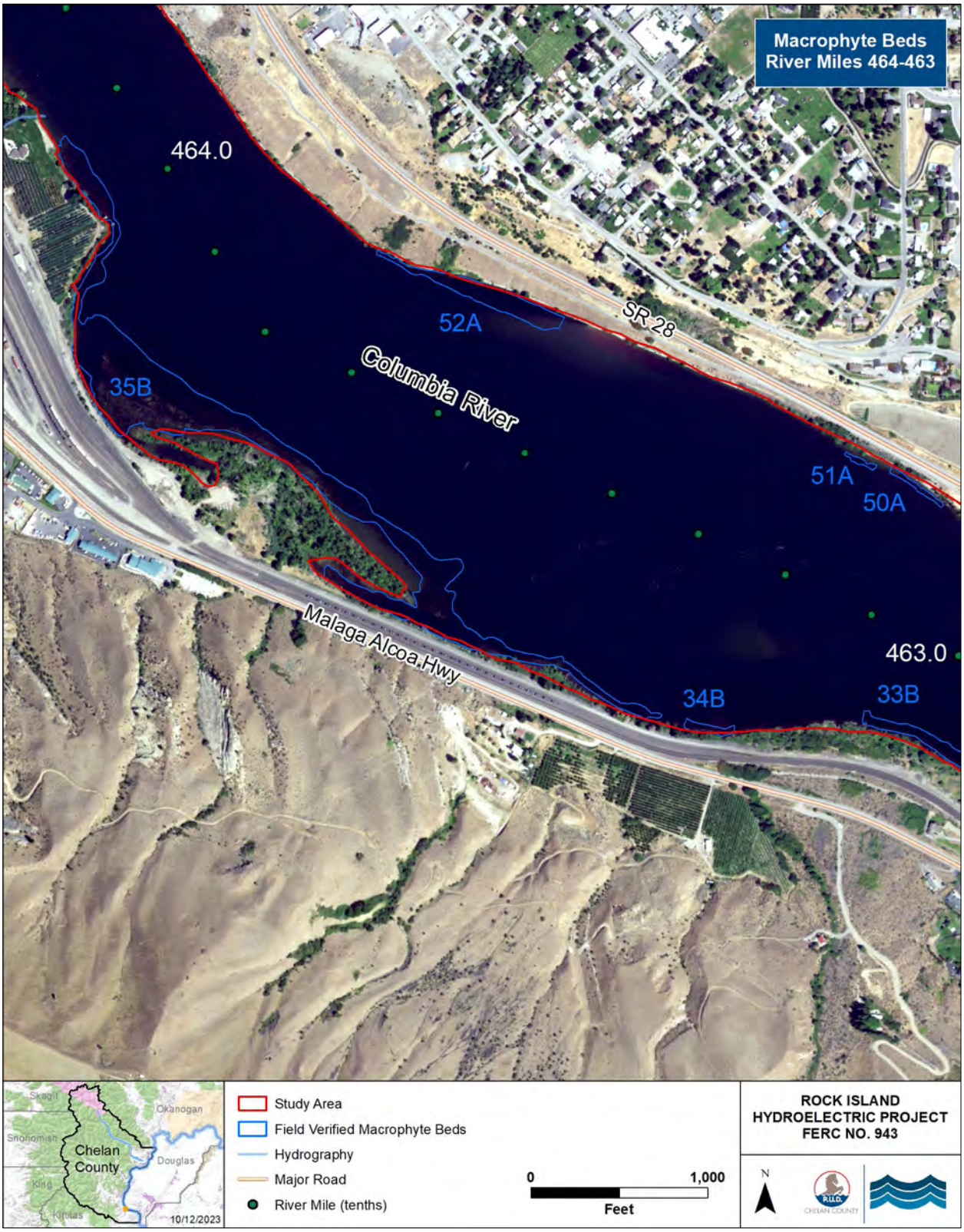


Figure A- 10 Macrophyte Beds at River Miles 464-463

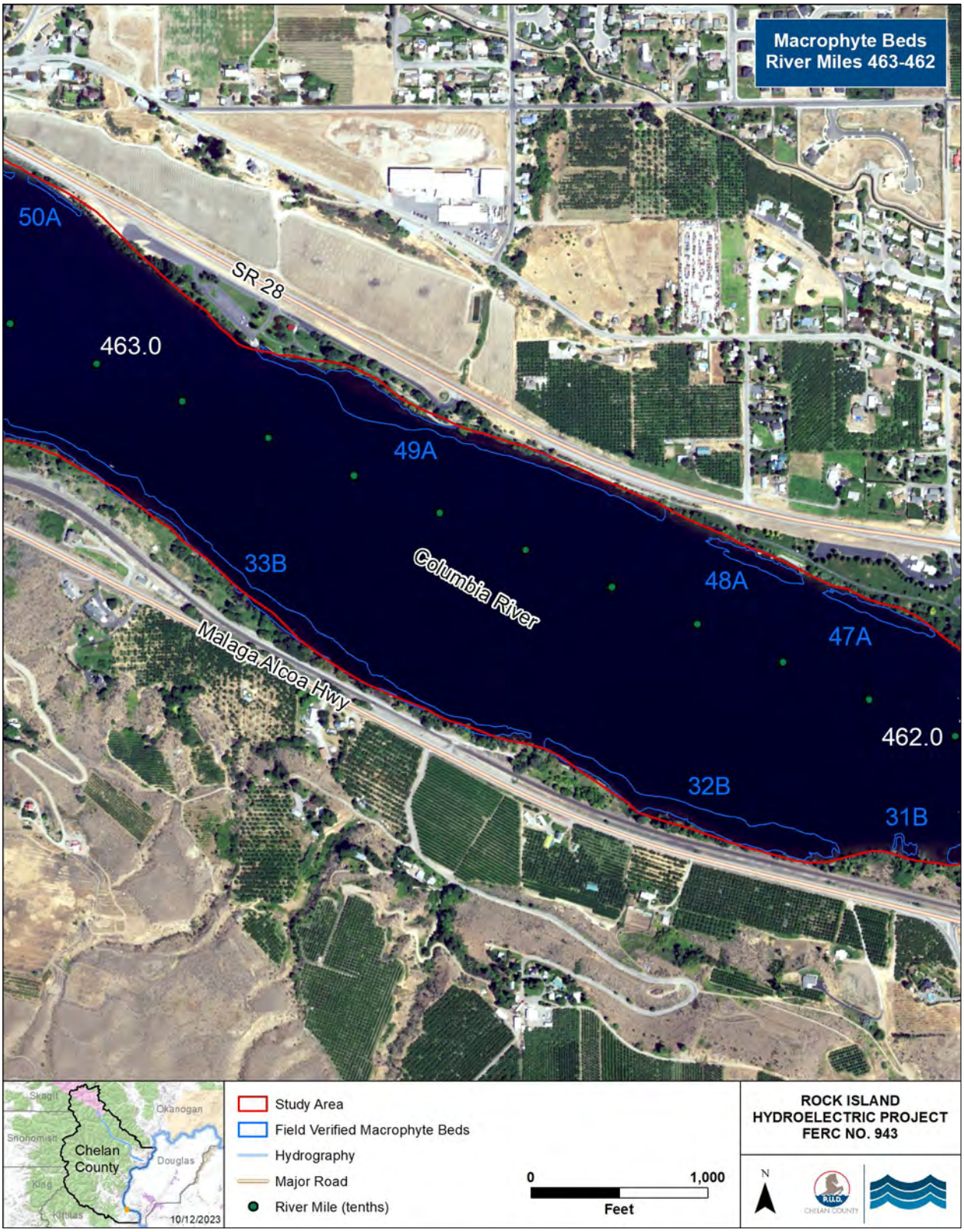


Figure A- 11 Macrophyte Beds at River Miles 463-462

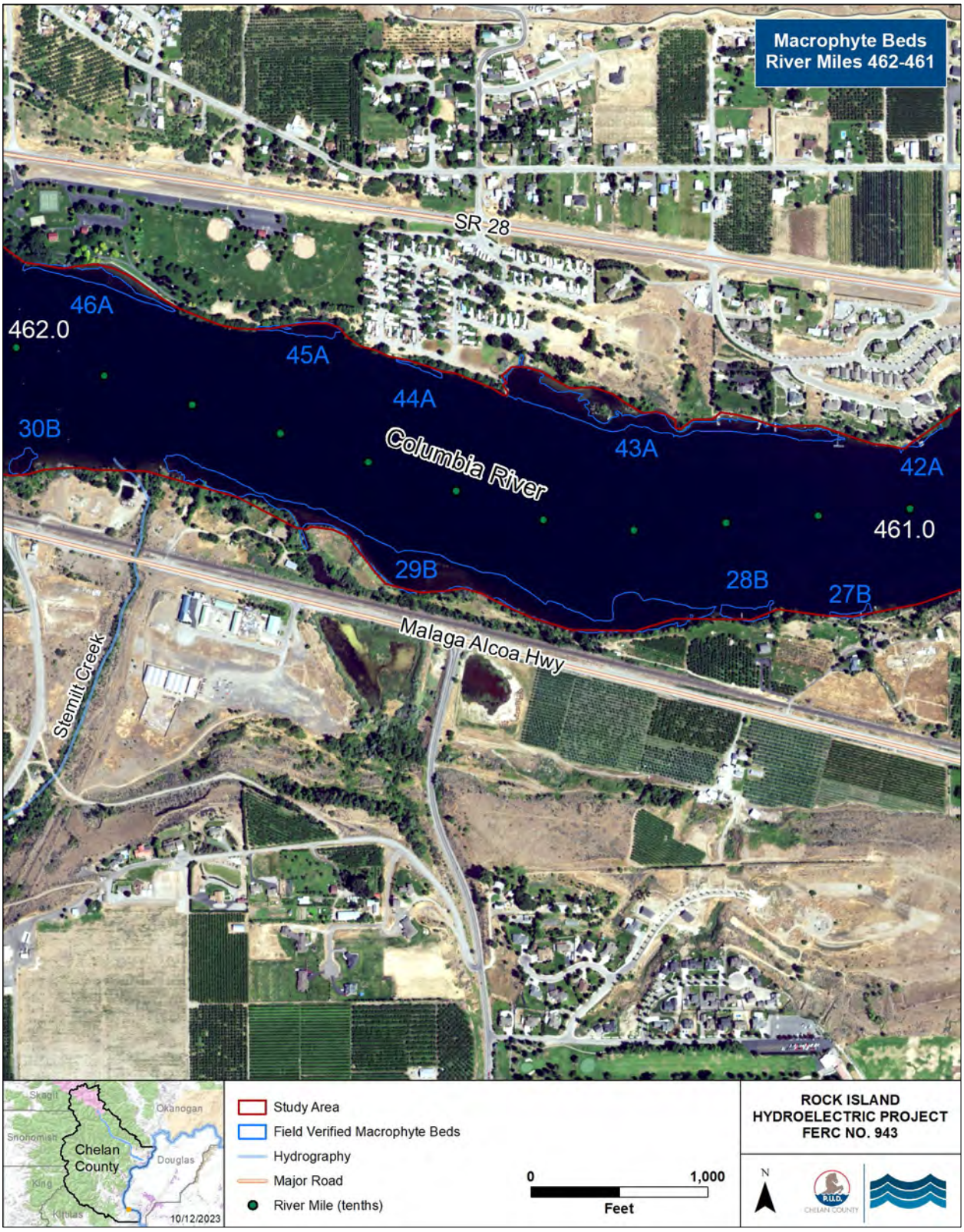


Figure A- 12 Macrophyte Beds at River Miles 462-461

Figure A- 13 Macrophyte Beds at River Miles 461-460

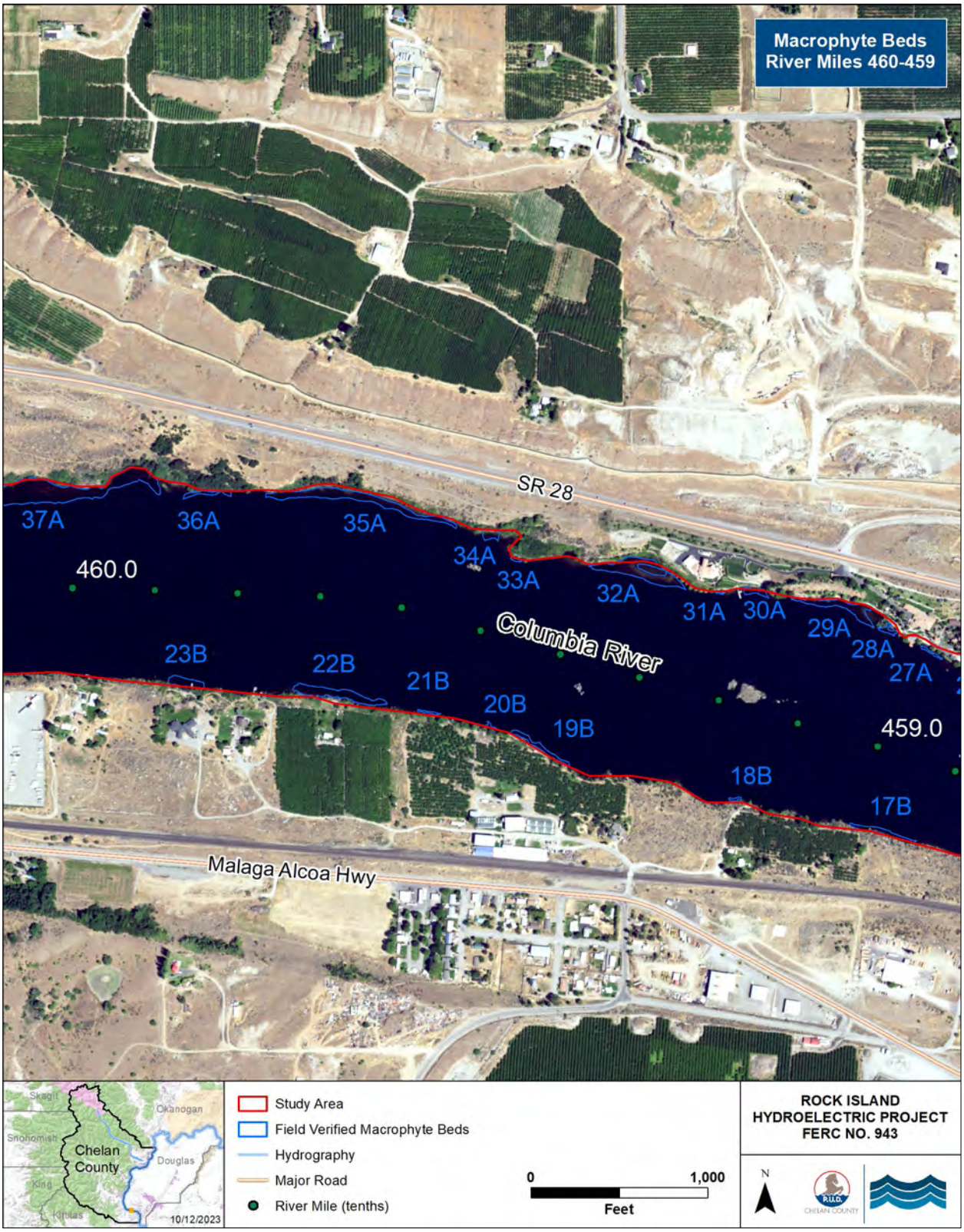


Figure A- 14 Macrophyte Beds at River Miles 460-459

Figure A- 15 Macrophyte Beds at River Miles 459-458

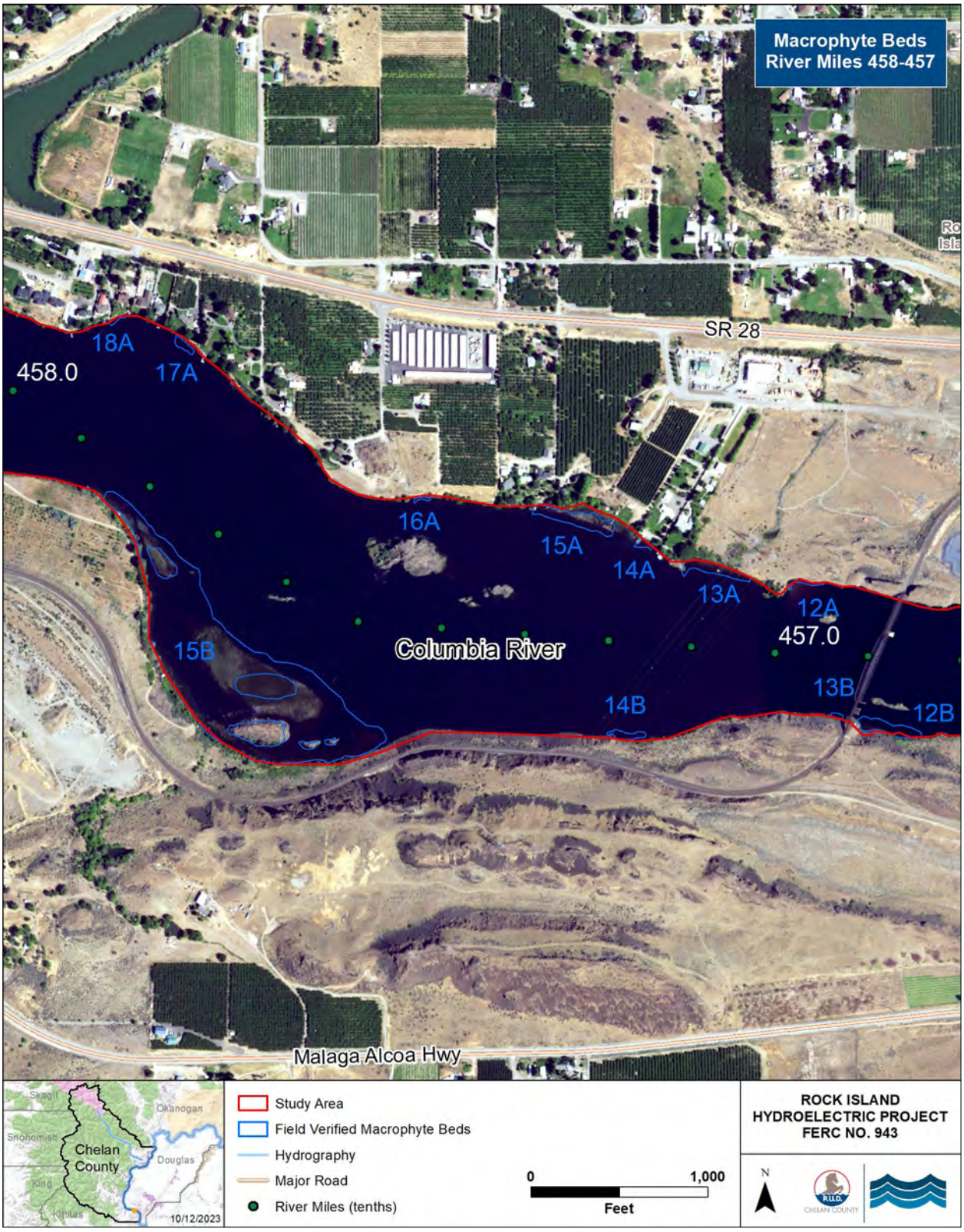


Figure A- 16 Macrophyte Beds at River Miles 458-457

Figure A- 17 Macrophyte Beds at River Miles 457-456

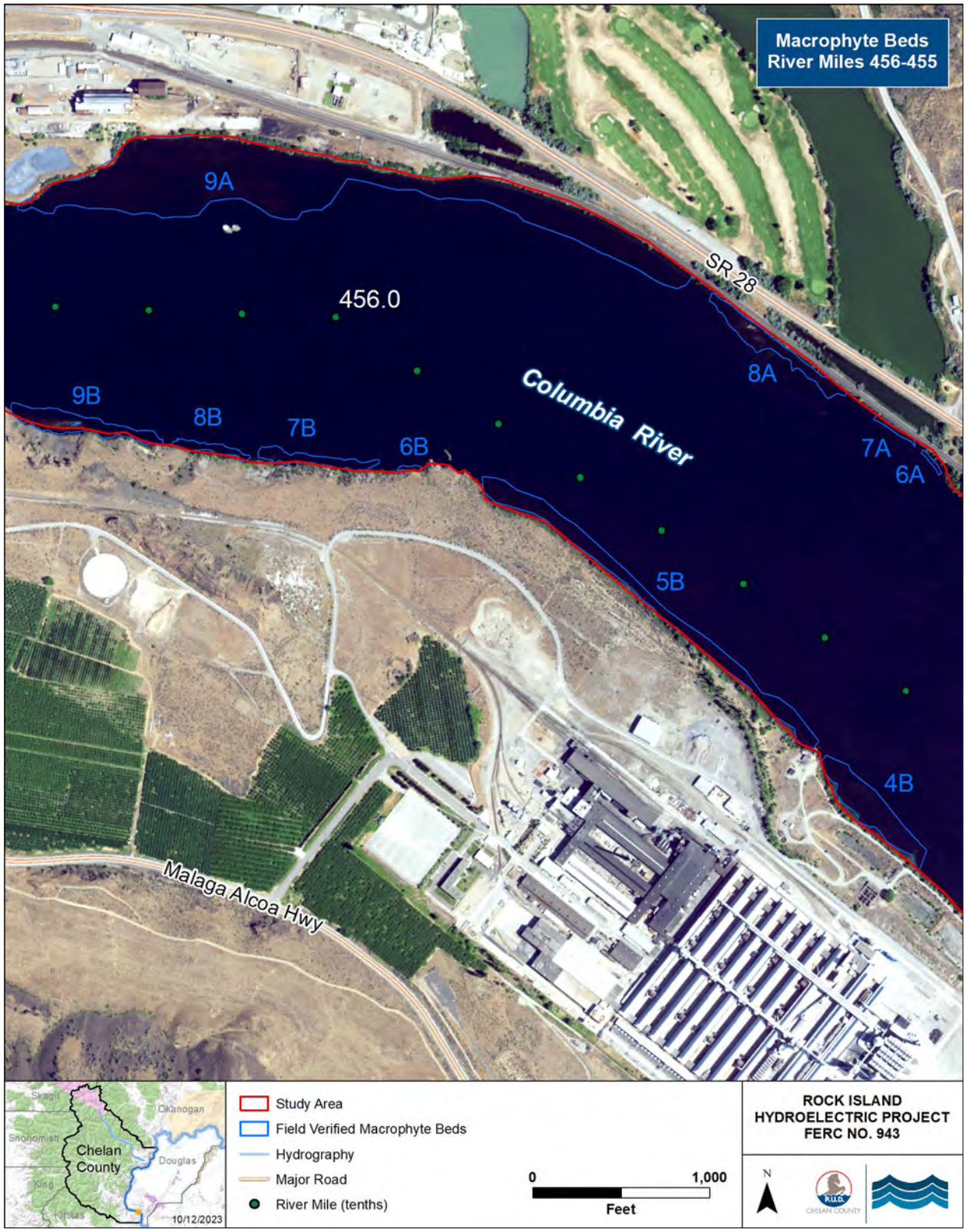


Figure A- 18 Macrophyte Beds at River Miles 456-455

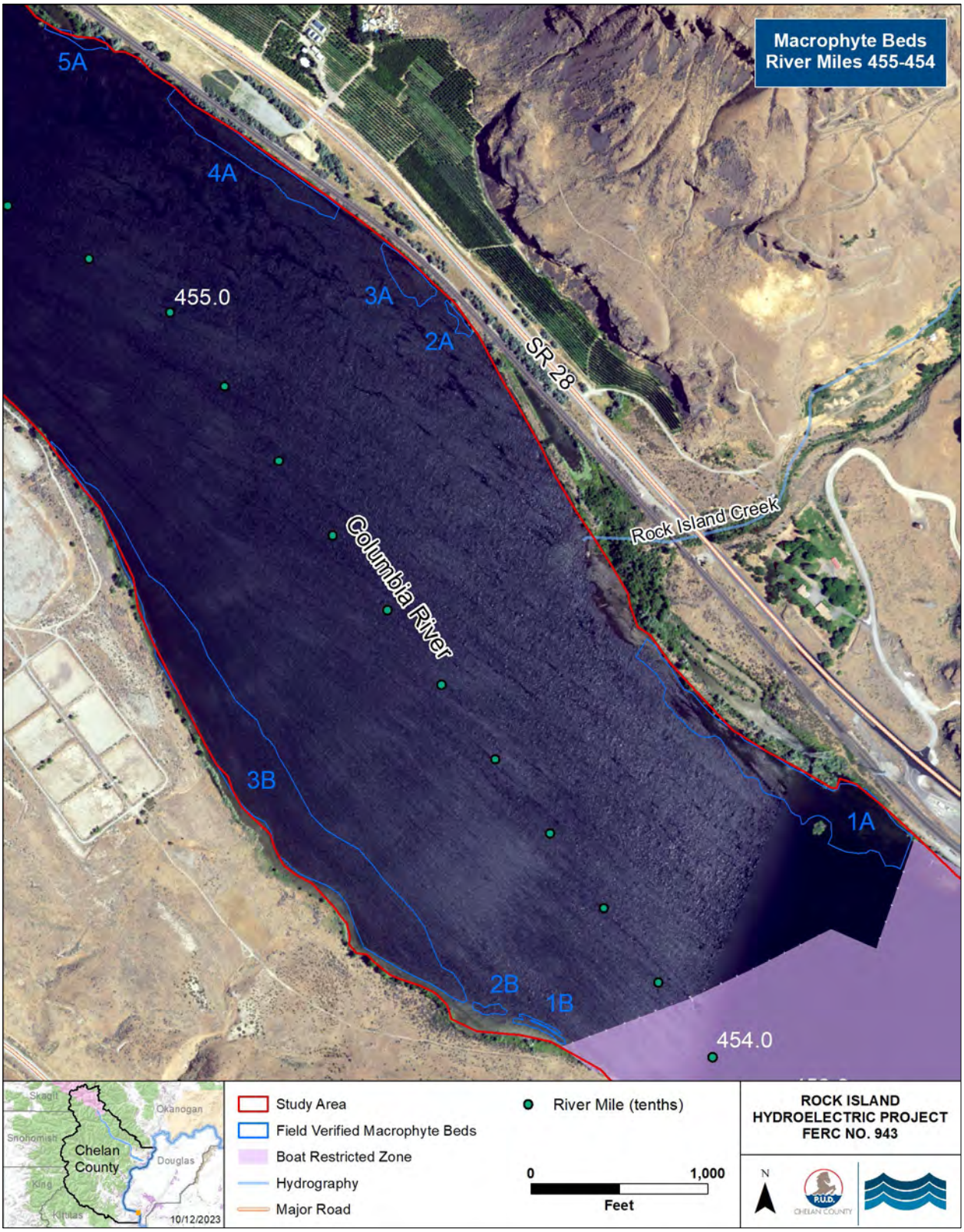


Figure A- 19 Macrophyte Beds at River Miles 455-454

APPENDIX B Macrophyte Bed Data from Field Surveys

2023 SITE ID	ACRES	EURASIAN WATERMILFOIL (*MYRIOPHYLLUM SPICATUM*)	COMMON WATERWEED (*ELODEA CANADENSIS*)	COONTAIL (*CERATOPHYLLUM DEMERSUM*)	WATER STARGRASS (*HETERANTHERA DUBIA*)	CURLY LEAF PONDWEED (*POTAMOGETON CRISPUS*)	WHITE-STEMMED PONDWEED (*POTAMOGETON PRAELONGUS*)	FLAT-STEM PONDWEED (*POTAMOGETON ZOSTERIFORMIS*)	LONGLEAF PONDWEED (*POTAMOGETON NODOSUS*)
1A	17.07	D	D	T	D	X	X		
2A	0.41	D			X	X	X		
3A	2.31	D	X		D	X	X		
4A	6.08	D		X	X	X			
5A	0.80	X	D		T	X	X		
6A	0.17	T	D						
7A	0.33	X	D						
8A	3.40	X	D		T	X	T		
9A	43.49	D	X	T	D	X	T		T
10A	1.71	X	D			X			
11A	0.33	X	D			X			
12A	0.17	X	D	X					
13A	1.00	X	D						
14A	0.15	X	D			T			
15A	1.63	X	D			T			
16A	0.07	D							
17A	0.24	X	D	T					
18A	0.09	X	D						
19A	0.56	D	X		T	X	X		
20A	0.10		D			X			
21A	0.07	X	D			X			
22A	0.04	X	D						
23A	0.81	D	D		X	X			
24A	0.51	X	D						
25A	0.17	X	D						
26A	0.29	D	X			X			
27A	0.07	D	X	X					
28A	0.13	D	X						
29A	0.92	D	X			X			
30A	0.20	D	X			X			
31A	0.01	T	D			X			
32A	1.71	X	D	T	X	X			
33A	0.04	D							
34A	0.25	X	D						
35A	2.05	X	D	T		X	X		

2023 SITE ID	ACRES	EURASIAN WATERMILFOIL (*MYRIOPHYLLUM SPICATUM*)	COMMON WATERWEED (*ELODEA CANADENSIS*)	COONTAIL (*CERATOPHYLLUM DEMERSUM*)	WATER STARGRASS (*HETERANTHERA DUBIA*)	CURLY LEAF PONDWEED (*POTAMOGETON CRISPUS*)	WHITE-STEMMED PONDWEED (*POTAMOGETON PRAELONGUS*)	FLAT-STEM PONDWEED (*POTAMOGETON ZOSTERIFORMIS*)	LONGLEAF PONDWEED (*POTAMOGETON NODOSUS*)
36A	0.26	X	D						
37A	6.69	X	D	T	X	X			
38A	0.01	X	D						
39A	0.15	D							
40A	0.17	D							
41A	0.29	D	X						
42A	0.37	X	D			T			
43A	7.78	X	D	T	T	X		T	
44A	0.32	T	D						
45A	1.23	X	D		X	X	T		
46A	2.11	X	D		T	X			
47A	1.88	X	D	T		X	T		
48A	1.86	X	D		X	X			
49A	10.44	D	X			X	X		
50A	0.50	D	X						
51A	0.25	D	X						
52A	4.21	X	D	X		X	T		
53A	0.07	D	D						
54A	0.22	D	X						
55A	0.40	D	X						
56A	0.69	D	D	T		X			
57A	0.15	D	X						
58A	0.36	D	X						
59A	1.04	D							
60A	6.86	D	D		T	T	T		
61A	0.53	D	D						
62A	0.26	D	D						
63A	1.72	D	X			T	X		
64A	0.78	D	X						
65A	0.15	D	X		T		T		
66A	0.04	D							
67A	0.32	D							
68A	1.20	D							
69A	0.52	D							
70A	0.15	D							

2023 SITE ID	ACRES	EURASIAN WATERMILFOIL (*MYRIOPHYLLUM SPICATUM*)	COMMON WATERWEED (*ELODEA CANADENSIS*)	COONTAIL (*CERATOPHYLLUM DEMERSUM*)	WATER STARGRASS (*HETERANTHERA DUBIA*)	CURLY LEAF PONDWEED (*POTAMOGETON CRISPUS*)	WHITE-STEMMED PONDWEED (*POTAMOGETON PRAELONGUS*)	FLAT-STEM PONDWEED (*POTAMOGETON ZOSTERIFORMIS*)	LONGLEAF PONDWEED (*POTAMOGETON NODOSUS*)
71A	6.18	D	X			X			
72A	4.22	D	X		X	T			
73A	24.27	X	D		X	X	X	T	
74A	0.31	X	X	T		D			
75A	0.42	D	X		X	X			
76A	0.37	D	X			X			
77A	1.22	D	D	D					
78A	0.53	D	X	D		X	X		
79A	0.18	D	X	X					
80A	0.10	D		D					
81A	0.59	X		D					
82A	0.17	D	X	X	T	T	T		
83A	1.72	D	X	T					
1B	0.63	X	X			D			
2B	0.43	T	X			D			
3B	40.92	T	X		X	D			
4B	5.17	T	X		X	D			
5B	8.84	T	X		X	D			
6B	0.14	D	X				X		
7B	1.81	X	D				D		
8B	0.93	X	D	X		D	X		
9B	3.59	D	D	X		D		X	
10B	0.06	D	X			T			
11B	0.08	D							
12B	1.07	D	X	T		X	X		
13B	0.09	X	X				D		
14B	0.36	D				X			
15B	0.33	X	X		X	D			
16B	0.42	X				D			
17B	0.39	D	D	T		X			
18B	0.05	D							
19B	0.38	D	D		X	X			
20B	0.05	X	D			X			
21B	0.06	X	D			X			
22B	1.14	X	D						

2023 SITE ID	ACRES	EURASIAN WATERMILFOIL (*MYRIOPHYLLUM SPICATUM*)	COMMON WATERWEED (*ELODEA CANADENSIS*)	COONTAIL (*CERATOPHYLLUM DEMERSUM*)	WATER STARGRASS (*HETERANTHERA DUBIA*)	CURLY LEAF PONDWEED (*POTAMOGETON CRISPUS*)	WHITE-STEMMED PONDWEED (*POTAMOGETON PRAELONGUS*)	FLAT-STEM PONDWEED (*POTAMOGETON ZOSTERIFORMIS*)	LONGLEAF PONDWEED (*POTAMOGETON NODOSUS*)
23B	0.44	X	D			X			
24B	0.18	X	D			X			
25B	0.07	D	X						
26B	0.48	X	D			X			
27B	0.33	X	D			X	X		
28B	0.94	X	D		X	X			
29B	18.66	X	X	X	X	D			
30B	0.67	D	D			X		X	
31B	0.32		D						
32B	8.83	D	X		X	D		X	
33B	12.47	D	X			D	X	X	
34B	0.63	D							
35B	36.76	D	D	X		D	X	X	
36B	1.43	D	X						
37B	1.86	D	X			X			
38B	2.38	D	X	T	T	D	X	X	
39B	2.90	D	X		T	D	X	X	
40B	0.21	D	X			X			
41B	0.18	D							
42B	0.55	D				D			
43B	0.43	X				D	X		
44B	2.94	X	D			X			
45B	0.80	D	X			X		X	
46B	0.49	D							
47B	0.96	D		T		X	T		
48B	1.95	D	X			X			
49B	0.20	D	X						
50B	0.64	X	X			D			
51B	9.80	D	X	T		X			
52B	0.52	D	X		T				
53B	9.68	D	X		T	X	X		
54B	1.57	D	X						
55B	0.21	D	X						
56B	0.69	D	X						
57B	0.82	D	X	X			X		

2023 SITE ID	ACRES	EURASIAN WATERMILFOIL (*MYRIOPHYLLUM SPICATUM*)	COMMON WATERWEED (*ELODEA CANADENSIS*)	COONTAIL (*CERATOPHYLLUM DEMERSUM*)	WATER STARGRASS (*HETERANTHERA DUBIA*)	CURLY LEAF PONDWEED (*POTAMOGETON CRISPUS*)	WHITE-STEMMED PONDWEED (*POTAMOGETON PRAELONGUS*)	FLAT-STEM PONDWEED (*POTAMOGETON ZOSTERIFORMIS*)	LONGLEAF PONDWEED (*POTAMOGETON NODOSUS*)
58B	0.75	D	X	X					
59B	0.10	D	X						
60B	0.05	D	X	X		T	T		
61B	0.65	D	X	X					
62B	0.07	D	X	X					
63B	0.07	D	X						
64B	0.29	D	X						
65B	0.22	D	T						
66B	0.12	D	T						
67B	0.05	D	T	T		T			
68B	0.09	D	T						
69B	0.03	D	T						
70B	0.19	D	T						
71B	0.05	D	T						
72B	0.06	D	T						
73B	0.19	D	T						
74B	0.35	D	T						
75B	0.33	D	X	T			T		
76B	0.93	D	X						
77B	0.45	D	X						
78B	0.83	D	X						
79B	1.39	D	X						
80B	0.16	D	T						
81B	0.19	X	D			T			
82B	0.19	D	X						
83B	1.89	D	D				T		

Source: EAS field data

Note: Survey data from field-verified macrophyte beds. Occurrences are denoted as dominant (D), occurring (X), and trace (T). No other macrophyte species other than the ones listed were observed.

APPENDIX C Consultation Record

Chelan PUD submitted the draft Macrophytes Study Report to the Fish and Aquatic Technical Working Group (TWG) (see Table C- 1) via email on October 26, 2023 for a 5-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table C- 2 below.

Table C- 1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
Audubon Society	Johnston, Mark
Blue Leaf	Wright, Corey
Blue Leaf	Robichaud, Dave
Bureau of Indian Affairs	Peterson, Harold
Bureau of Indian Affairs	Hatch, Keith
Bureau of Indian Affairs	Lewis, Steve
Chelan County	Sanderson, Julie
Chelan County Public Utility District No. 1	Underwood, Alene
Chelan County Public Utility District No. 1	Truscott, Ben
Chelan County Public Utility District No. 1	Odell, Brian
Chelan County Public Utility District No. 1	Willard, Catherine
Chelan County Public Utility District No. 1	Ulrich, Janel
Chelan County Public Utility District No. 1	Taylor, Kate
Chelan County Public Utility District No. 1	Keller, Lance
Chelan County Public Utility District No. 1	Clark, Laura
Chelan County Public Utility District No. 1	Vanney, Peter
Chelan County Public Utility District No. 1	Hopkins, Scott
Chelan County Public Utility District No. 1	Towey, William
City of Rock Island	Laughlin, Brock
Columbia River Inter-Tribal Fish Commission	Barton, Diane
Columbia River Inter-Tribal Fish Commission	Carter, Julie
Columbia River Inter-Tribal Fish Commission	Miller, Donella
Columbia River Inter-Tribal Fish Commission	Parker, Blaine
Columbia River Inter-Tribal Fish Commission	Porter, Lauri
Columbia River Inter-Tribal Fish Commission	Skiles, Tom
Confederated Tribes and Bands of Yakama Nation	Blodgett, David
Confederated Tribes and Bands of Yakama Nation	Iverson, Tom
Confederated Tribes and Bands of Yakama Nation	Lampman, Ralph
Confederated Tribes and Bands of Yakama Nation	Murdoch, Keely
Confederated Tribes and Bands of Yakama Nation	Rogers, Brandon

ORGANIZATION	NAME
Confederated Tribes of the Colville Reservation	Nine, Bret
Confederated Tribes of the Colville Reservation	Baldwin, Casey
Confederated Tribes of the Colville Reservation	McLellan, Jason
Confederated Tribes of the Colville Reservation	Truscott, Kirk
Confederated Tribes of the Umatilla Indian Reservation	Jackson, Aaron
Confederated Tribes of the Umatilla Indian Reservation	Huber, Audie
Confederated Tribes of the Umatilla Indian Reservation	Hall, Brent
Confederated Tribes of the Umatilla Indian Reservation	Merkle, Carl
Confluence Environmental Company	Doyle, Eric
Environmental Assessment Services	Paulsen, Matt
Four Peaks	Miller, Joe
Four Peaks	Nagel, Leah
Four Peaks	Mugunthan, Pradeep
Golder Associates	Grutter, Paul
Individual	Stuart, Derek
Individual	Hays, Steve
Kearns & West	Hessenius, Angela
Kearns & West	Downing, Jim
Kearns & West	Kennedy, Katy
Kearns & West	Rugani, Kelsey
Kearns & West	Day, Mary
Kleinschmidt Associates	Thompson, Audrey
Kleinschmidt Associates	Deason, Jeff
Kleinschmidt Associates	Steimle, Kai
Kleinschmidt Associates	Keefe, MaryLouise
Kleinschmidt Associates	Denis, Nathalie
Kleinschmidt Associates	Smith, Olivia
National Oceanic and Atmospheric and Administration	Yeager, Justin
National Oceanic and Atmospheric and Administration	Carlon, Scott
Northwest Power and Conservation Council	Horton, Stacy
Northwest Power and Conservation Council	Mounts, Sara
Upper Columbia River Salmon Recovery Board	Niemeyer, Ryan
U.S. Bureau of Reclamation	Hoff, Gina
U.S. Bureau of Reclamation	Archuleta, Shannon
U.S. Fish and Wildlife Service	McKeag, Lizzy
U.S. Fish and Wildlife Service	Romine, Jason
U.S. Fish and Wildlife Service	Muir, Kenneth
U.S. Fish and Wildlife Service	Nelle, R

ORGANIZATION	NAME
U.S. Fish and Wildlife Service	Kokos, Sonja
U.S. Fish and Wildlife Service	Callaway, Tara
U.S. Fish and Wildlife Service	Gale, William
Washington State Department of Ecology	Zimmerman, Breean
Washington State Department of Ecology	Bugica, Kalman
Washington State Department of Ecology	Peterschmidt, Mark
Washington State Department of Ecology	Oreiro, Tyson
Washington State Department of Fish and Wildlife	Murdoch, Andrew
Washington State Department of Fish and Wildlife	Blank, Benjamin
Washington State Department of Fish and Wildlife	Jackson, Chad
Washington State Department of Fish and Wildlife	Burgess, Dave
Washington State Department of Fish and Wildlife	Heironimus, Laura
Washington State Department of Fish and Wildlife	Jewell, Sgt
Washington State Department of Fish and Wildlife	Verhey, Patrick
Washington State Department of Natural Resources	Preston, Cindy
Washington State Department of Natural Resources	Huinker, James
Washington State Parks	Fielding, Andrew
Washington State Parks	Harris, Chelsea

Table C- 2 Comments Received

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
I-2-1	10/30/23	Gina Hoff, U.S. Bureau of Reclamation	Rock Island Relicensing Macrophytes Study Report	No comments, at this time.	Thank you for reviewing the study report.
I-3-1	11/01/23	Steven Hays, Individual	Rock Island Relicensing Macrophytes Study Report	This is a very informative and well written report. I only have a couple of comments: There is no mention of the depth distribution of different species within the macrophyte beds. ELCA (common waterweed) and CEDE (coontail) inhabit the shallow areas, whereas MYSP (Eurasian watermilfoil) and POCR (curly leaf pondweed) are typically associated with depths greater than a few feet. When discussing species dominance, the fact that there is much less shallow habitat area than the deeper water habitat should be mentioned. Conclusions related to whether a species listed as present in the 1984 - 1990 surveys may have disappeared need caution. Those surveys were done without the benefit of a botanist or other plant identification expert and the pondweed family can be difficult to properly identify. It is possible that P. pectinatus, P. richardsonii, and P. pusillus were misidentified during those surveys. That is not to critic those surveys but conclusions about species having disappeared should be made with caution. In 1990, surveys conducted in the Rock Island Reservoir documented 218 acres of macrophyte beds (Chelan PUD 1990). Species documented included Eurasian watermilfoil (Myriophyllum spicatum), curly leaf pondweed (Potamogeton crispus), small pondweed (Potamogeton pusillus), and common waterweed (Elodea canadensis). Two other native species, fennel-leaf pondweed (Potamogeton pectinatus) and Richardson's pondweed (Potamogeton richardsonii) were observed incidentally between 1984 and 1990 (Chelan PUD 1990) but were not observed in 2023. .... Although there is a chance that an incidental species was missed during the 2023 surveys, there is also a possibility that native species incidentally observed 33 years ago have disappeared from the area. Thank you for the opportunity to comment on this report.	Thank you for reviewing the study report. The study report has been updated to provide clarity regarding macrophyte species dominance relative to depth distribution (see Section 6.1). Additionally, Section 6.2 has been updated to include the possibility that some macrophyte species were misidentified in the Chelan PUD 1990 report.

From:	RIRelicensing
To:	"aaronjackson@ctuir.org"; "AHessenius@kearnswest.com"; Alene Underwood; "andrew.fielding@parks.wa.gov"; "Andrew.Murdoch@dfw.wa.gov"; "AudieHuber@ctuir.org"; "Audrey.Thompson@kleinschmidtgroup.com"; "bard@critfc.org"; Ben Truscott; "Benjamin.Blank@dfw.wa.gov"; "bladescodeservices@yahoo.com"; "blod@yakamafish-nsn.gov"; "brenthall@ctuir.org"; "bret.nine@colvilletribes.com"; Brian Odell; "bzim461@ecy.wa.gov"; "carj@critfc.org"; "CarlMerkle@ctuir.org"; "Casey.Baldwin@colvilletribes.com"; Catherine Willard; "chad.jackson@dfw.wa.gov"; "Chelsea.Harris@parks.wa.gov"; "cindy.preston@dnr.wa.gov"; "cwright@lgl.com"; "dave.burgess@dfw.wa.gov"; "dmiller@critfc.org"; "drobichaud@lgl.com"; "DStuart@nhcweb.com"; "elizabeth_mckeag@fws.gov"; "eric.doyle@confenv.com"; "ghoff@usbr.gov"; "Harold.Peterson@bia.gov"; "ivet@yakamafish-nsn.gov"; "James.Huinker@dnr.wa.gov"; Janel Ulrich; "jason.mclellan@colvilletribes.com"; "jason_romine@fws.gov"; "jdowning@kearnswest.com"; "jeff.deason@kleinschmidtgroup.com"; "jmiller@fourpeaksenv.com"; "julie.sanderson@co.chelan.wa.us"; "justin.yeager@noaa.gov"; "kai.steimle@kleinschmidtgroup.com"; "kalman.bugica@ecy.wa.gov"; Kate Taylor; "keith.hatch@indianaffairs.gov"; "kenneth_muir@fws.gov"; "kirk.truscott@colvilletribes.com"; "kkennedy@kearnswest.com"; "krugani@kearnswest.com"; "lamr@yakamafish-nsn.gov"; Lance Keller; Laura Clark; "laura.heironimus@dfw.wa.gov"; "lnagel@fourpeaksenv.com"; "mape461@ecy.wa.gov"; "marylouise.keefe@kleinschmidtgroup.com"; "matt.paulsen@komanholdings.com"; "mbday@kearnswest.com"; "murk@yakamafish-nsn.gov"; "Nathalie.Denis@Kleinschmidtgroup.com"; "oliviasmith23@hotmail.com"; "parb@critfc.org"; "Patrick.Verhey@dfw.wa.gov"; "Paul_Grutter@golder.com"; Peter Vanney; "pmugunthan@fourpeaksenv.com"; "porl@critfc.org"; RIRelicensing; "RD_Nelle@fws.gov"; "rogb@yakamafish-nsn.gov"; "Ryan.niemeyer@ucsrb.org"; "sarchuleta@usbr.gov"; "scott.carlon@noaa.gov"; Scott Hopkins; "sghays51@msn.com"; "shorton@nwcouncil.org"; "skit@critfc.org"; "SMounts@NWCouncil.org"; "Sonja_Kokos@fws.gov"; "stephen.lewis@bia.gov"; "tara_callaway@fws.gov"; "tore461@ecy.wa.gov"; "toxostoma495@gmail.com"; Bill Towey; "william_gale@fws.gov"
Subject:	RE: RI Relicensing Macrophytes Study Report - Comment Opportunity
Date:	Tuesday, October 31, 2023 8:37:38 AM
Attachments:	image001.png

Good morning,

This is a reminder that comments on the Macrophytes Study Report are due **by EOD this Thursday, November 2.**

Click the link to access the document and submit your comments. Again, if you have no comments after your review, we appreciate the submission through the Smart Comment platform of "no comment" as that is helpful for the consultation record.

Thank you,

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Thursday, October 26, 2023 10:17 AM
To: 'aaronjackson@ctuir.org' <aaronjackson@ctuir.org>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; Alene Underwood <Alene.Underwood@chelanpud.org>; 'andrew.fielding@parks.wa.gov' <andrew.fielding@parks.wa.gov>; 'Andrew.Murdoch@dfw.wa.gov' <Andrew.Murdoch@dfw.wa.gov>; 'AudieHuber@ctuir.org' <AudieHuber@ctuir.org>; 'Audrey.Thompson@kleinschmidtgroup.com' <Audrey.Thompson@kleinschmidtgroup.com>; 'bard@critfc.org' <bard@critfc.org>; Ben Truscott <Ben.Truscott@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'blod@yakamafish-nsn.gov' <blod@yakamafish-nsn.gov>; 'brenthall@ctuir.org' <brenthall@ctuir.org>; 'bret.nine@colvilletribes.com' <bret.nine@colvilletribes.com>; Brian Odell <brian.odell@chelanpud.org>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'carj@critfc.org' <carj@critfc.org>; 'CarlMerkle@ctuir.org' <CarlMerkle@ctuir.org>; 'Casey.Baldwin@colvilletribes.com' <Casey.Baldwin@colvilletribes.com>;

Catherine Willard <Catherine.Willard@chelanpud.org>; 'chad.jackson@dfw.wa.gov' <chad.jackson@dfw.wa.gov>; 'Chelsea.Harris@parks.wa.gov' <Chelsea.Harris@parks.wa.gov>; 'cindy.preston@dnr.wa.gov' <cindy.preston@dnr.wa.gov>; 'cwright@lgl.com' <cwright@lgl.com>; 'dave.burgess@dfw.wa.gov' <dave.burgess@dfw.wa.gov>; 'dmiller@critfc.org' <dmiller@critfc.org>; 'drobichaud@lgl.com' <drobichaud@lgl.com>; 'DStuart@nhcweb.com' <DStuart@nhcweb.com>; 'elizabeth_mckeag@fws.gov' <elizabeth_mckeag@fws.gov>; 'eric.doyle@confenv.com' <eric.doyle@confenv.com>; 'ghoff@usbr.gov' <ghoff@usbr.gov>; 'Harold.Peterson@bia.gov' <Harold.Peterson@bia.gov>; 'ivet@yakamafish-nsn.gov' <ivet@yakamafish-nsn.gov>; 'James.Huinker@dnr.wa.gov' <James.Huinker@dnr.wa.gov>; Janel Ulrich <janel.ulrich@chelanpud.org>; 'jason.mclellan@colvilletribes.com' <jason.mclellan@colvilletribes.com>; 'jason_romine@fws.gov' <jason_romine@fws.gov>; 'jdowning@kearnswest.com' <jdowning@kearnswest.com>; 'jeff.deason@kleinschmidtgroup.com' <jeff.deason@kleinschmidtgroup.com>; 'jmiller@fourpeaksenv.com' <jmiller@fourpeaksenv.com>; 'julie.sanderson@co.chelan.wa.us' <julie.sanderson@co.chelan.wa.us>; 'justin.yeager@noaa.gov' <justin.yeager@noaa.gov>; 'kai.steimle@kleinschmidtgroup.com' <kai.steimle@kleinschmidtgroup.com>; 'kalman.bugica@ecy.wa.gov' <kalman.bugica@ecy.wa.gov>; Kate Taylor <Kate.Taylor@chelanpud.org>; 'keith.hatch@indianaffairs.gov' <keith.hatch@indianaffairs.gov>; 'kenneth_muir@fws.gov' <kenneth_muir@fws.gov>; 'kirk.truscott@colvilletribes.com' <kirk.truscott@colvilletribes.com>; 'kkennedy@kearnswest.com' <kkennedy@kearnswest.com>; 'krugani@kearnswest.com' <krugani@kearnswest.com>; 'lamr@yakamafish-nsn.gov' <lamr@yakamafish-nsn.gov>; Lance Keller <Lance.Keller@chelanpud.org>; Laura Clark <Laura.Clark@chelanpud.org>; 'laura.heironimus@dfw.wa.gov' <laura.heironimus@dfw.wa.gov>; 'lnagel@fourpeaksenv.com' <lnagel@fourpeaksenv.com>; 'mape461@ecy.wa.gov' <mape461@ecy.wa.gov>; 'marylouise.keefe@kleinschmidtgroup.com' <marylouise.keefe@kleinschmidtgroup.com>; 'matt.paulsen@komanholdings.com' <matt.paulsen@komanholdings.com>; 'mbday@kearnswest.com' <mbday@kearnswest.com>; 'murk@yakamafish-nsn.gov' <murk@yakamafish-nsn.gov>; 'Nathalie.Denis@Kleinschmidtgroup.com' <Nathalie.Denis@Kleinschmidtgroup.com>; 'oliviasmith23@hotmail.com' <oliviasmith23@hotmail.com>; 'parb@critfc.org' <parb@critfc.org>; 'Patrick.Verhey@dfw.wa.gov' <Patrick.Verhey@dfw.wa.gov>; 'Paul_Grutter@golder.com' <Paul_Grutter@golder.com>; Peter Vanney <Peter.Vanney@chelanpud.org>; 'pmugunthan@fourpeaksenv.com' <pmugunthan@fourpeaksenv.com>; 'porl@critfc.org' <porl@critfc.org>; 'RD_Nelle@fws.gov' <RD_Nelle@fws.gov>; RIRelicensing <RIRelicensing@chelanpud.org>; 'rogb@yakamafish-nsn.gov' <rogb@yakamafish-nsn.gov>; 'Ryan.niemeyer@ucsrb.org' <Ryan.niemeyer@ucsrb.org>; 'sarchuleta@usbr.gov' <sarchuleta@usbr.gov>; 'scott.carlon@noaa.gov' <scott.carlon@noaa.gov>; Scott Hopkins <Scott.Hopkins@chelanpud.org>; 'sghays51@msn.com' <sghays51@msn.com>; 'shorton@nwcouncil.org' <shorton@nwcouncil.org>; 'skit@critfc.org' <skit@critfc.org>; 'SMounts@NWCouncil.org' <SMounts@NWCouncil.org>; 'Sonja_Kokos@fws.gov' <Sonja_Kokos@fws.gov>; 'stephen.lewis@bia.gov' <stephen.lewis@bia.gov>; 'tara_callaway@fws.gov' <tara_callaway@fws.gov>; 'tore461@ecy.wa.gov' <tore461@ecy.wa.gov>; 'toxostoma495@gmail.com' <toxostoma495@gmail.com>; Bill Towey <bill.towey@chelanpud.org>; 'william_gale@fws.gov' <william_gale@fws.gov>
Subject: RI Relicensing Macrophytes Study Report - Comment Opportunity

Good morning,

Here is the link to comment on the Macrophytes Study Report. Click the link to access the document and submit your comments.
If you have no comments after your review, we appreciate the submission through the Smart Comment platform of “no comment” as that is helpful for the consultation record.

Comments are to be submitted by EOD Thursday, November 2, 2023.

Thank you for your participation.

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Rock Island Relicensing Macrophytes Study Report

Chelan County PUD invites stakeholders to provide comments on our draft study report. Please review the document (click "Review Document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City (Required)

State

Washington

ZIP

Email (Required)

Your Comment

Comments can be submitted through an attachment or provided directly in the space below.

Review Document

Insert comments on Rock Island Relicensing Macrophytes Study Report

Upload a File

Uploading a file is optional

You may attach up to five 20 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment please contact the person listed at the bottom of this page.

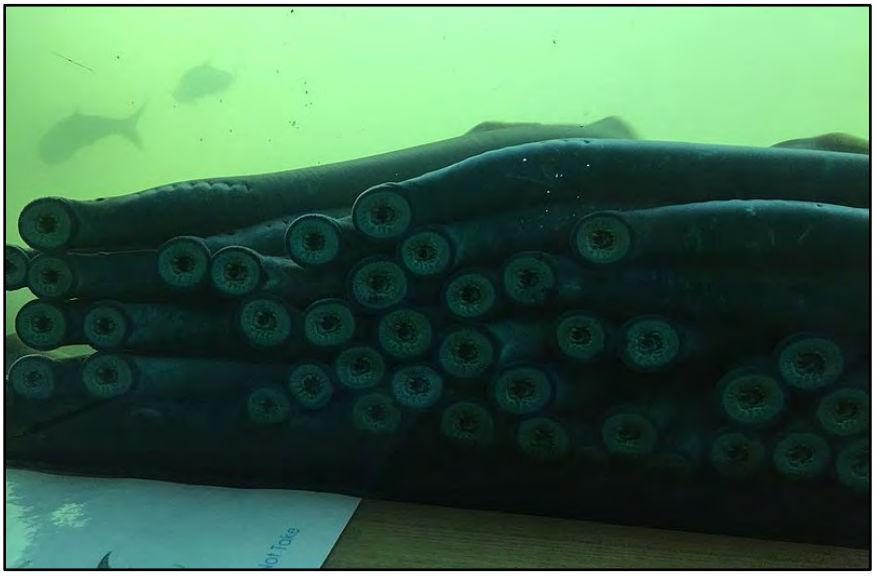
Continue

G.3 ADULT PACIFIC LAMPREY INFRASTRUCTURE ASSESSMENT

ADULT PACIFIC LAMPREY FISHWAY INFRASTRUCTURE ASSESSMENT STUDY PLAN

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943



Source: Lindsey Wise, Portland State University

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

FEBRUARY 2023

ADULT PACIFIC LAMPREY FISHWAY INFRASTRUCTURE ASSESSMENT STUDY PLAN

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

FOUR PEAKS ENVIRONMENTAL
Science & Data Solutions

FEBRUARY 2023

TABLE OF CONTENTS

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TERMS AND ABBREVIATION LIST

C	
Chelan PUD	Public Utility District No. 1 of Chelan County
E	
ESA	Endangered Species Act
F	
FERC	Federal Energy Regulatory Commission
I	
ILP	Integrated Licensing Process
L	
LTWG	Lamprey Technical Workgroup
N	
NGVD 29	National Geodetic Vertical Datum 1929
P	
PAD	Preliminary Application Document
PLCI	Pacific Lamprey Conservation Initiative
PHS	Priority Habitat and Species Program
PTAGIS	Columbia Basin PIT Tag Information System
R	
RM	river mile
Rock Island Project	Rock Island Hydroelectric Project FERC No. 943
S	
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
T	
TWG	technical working group
U	
USFWS	U.S. Fish and Wildlife Service
W	
WDFW	Washington Department of Fish and Wildlife

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Rock Island Project). The Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Project, which will use the Integrated Licensing Process. Chelan PUD intends to implement this study plan in 2023 and include its results in the Pre-Application Document (PAD). Decision criteria for early study plan development and implementation have been designed to match those described in FERC's guidance for applying study criteria in the Integrated Licensing Process[1].

[1] FERC, *A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria* (March 2012). https://www.ferc.gov/sites/default/files/2020-07/guide-study-criteria.pdf

2.0 STUDY GOALS AND OBJECTIVES

This study is based upon the issue statement developed during early engagement that states:

"Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration."

The primary goal of this study is to develop additional information necessary to assess potential project effects on upstream passage of adult Pacific Lamprey at the Rock Island Project. The specific objective of this study is to characterize physical infrastructure conditions within the three fishways at the Rock Island Project that have the potential to affect both upstream passage success and enumeration of adult Pacific Lamprey (*Entosphenus tridentatus*).

3.0 RELEVANT RESOURCE MANAGEMENT GOALS OR PUBLIC INTEREST CONSIDERATIONS

The Pacific Lamprey is a culturally and ecologically important anadromous fish species native to the Columbia River Basin (Clemens et al. 2017). Coastwide declines of Pacific Lamprey led to a petition for listing under the Endangered Species Act (ESA) in 2003. The U.S. Fish and Wildlife Service (USFWS) found that listing was not warranted based on insufficient information on biology, ecological requirements, and particular threats to Pacific Lamprey (USFWS 2004). Conservation and recovery initiatives have since been developed by tribal entities (e.g., CRITFC 2011) and USFWS (2012). In 2012, the Conservation Agreement for Pacific Lamprey Conservation Agreement in the States of Alaska, Washington, Oregon, Idaho, and California was developed by USFWS and tribal partners, with support from 12 regional entities (PLCI 2022). The USFWS has also developed regional implementation plans to protect and conserve Pacific Lamprey, including one for the Upper Columbia River (Grote 2021). The Washington Department of Fish and Wildlife (WDFW) considers Pacific Lamprey to be a Species of Greatest Conservation Need (SGCN) under the State Wildlife Action Plan (SWAP; WDFW 2015) and a Priority Species under the State's Priority Habitat and Species Program (PHS; WDFW 2008). Chelan PUD developed a Pacific Lamprey Management Plan for the Rocky Reach Hydroelectric Project (Chelan PUD 2005); Pacific Lamprey Management Plans were also developed for the Wells and Priest Rapids hydroelectric projects (GPUD 2009; DPUD 2009).

4.0 GEOGRAPHIC SCOPE

The Rock Island Project is located on the Columbia River near the cities of Wenatchee and East Wenatchee in Chelan County and Douglas County, Washington, from river mile (RM) 453.4 to RM 473.7. The study area encompasses the Rock Island adult fishways, shown in Figure 4-1, Figure 4-2, Figure 4-3, and Figure 4-4.

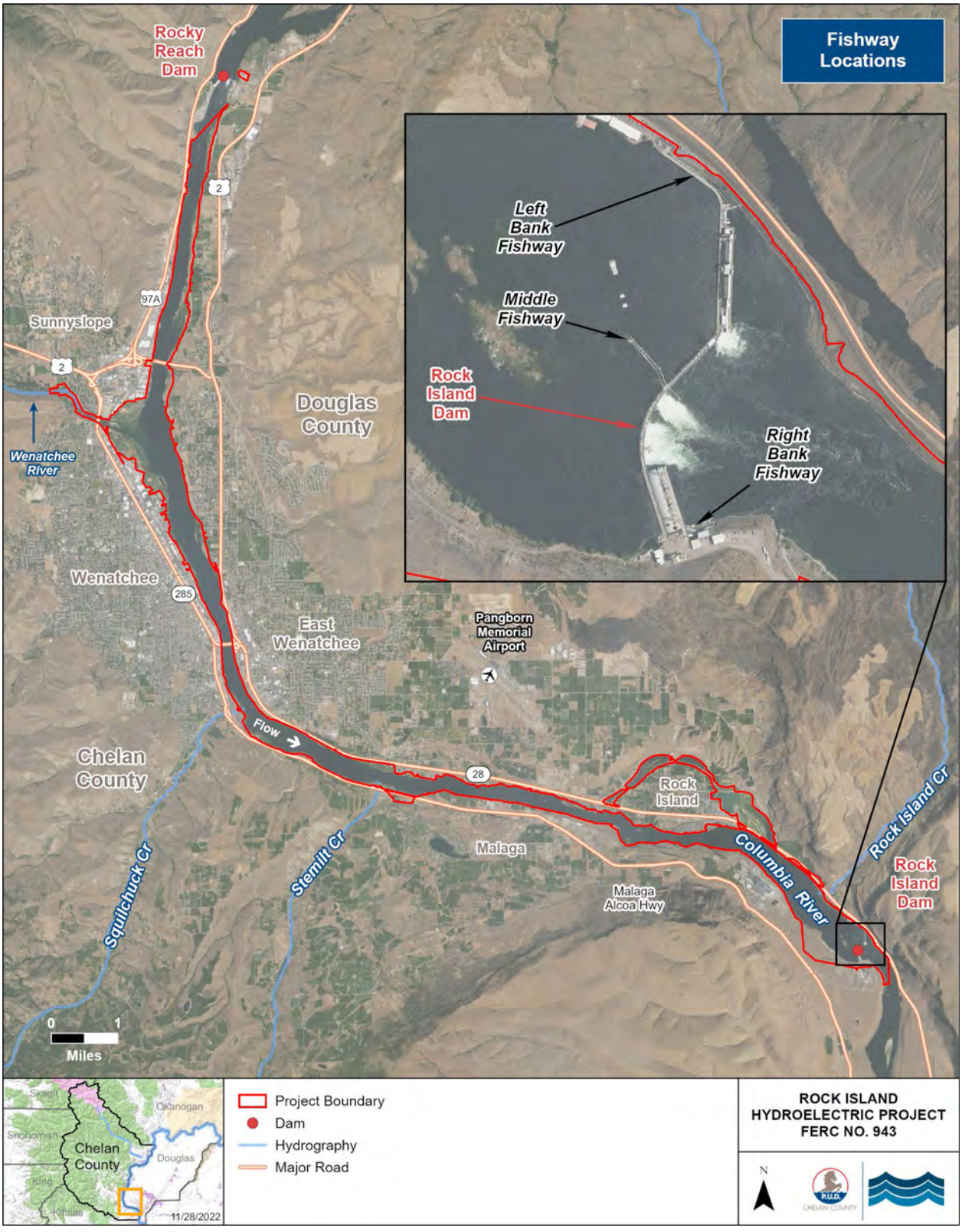
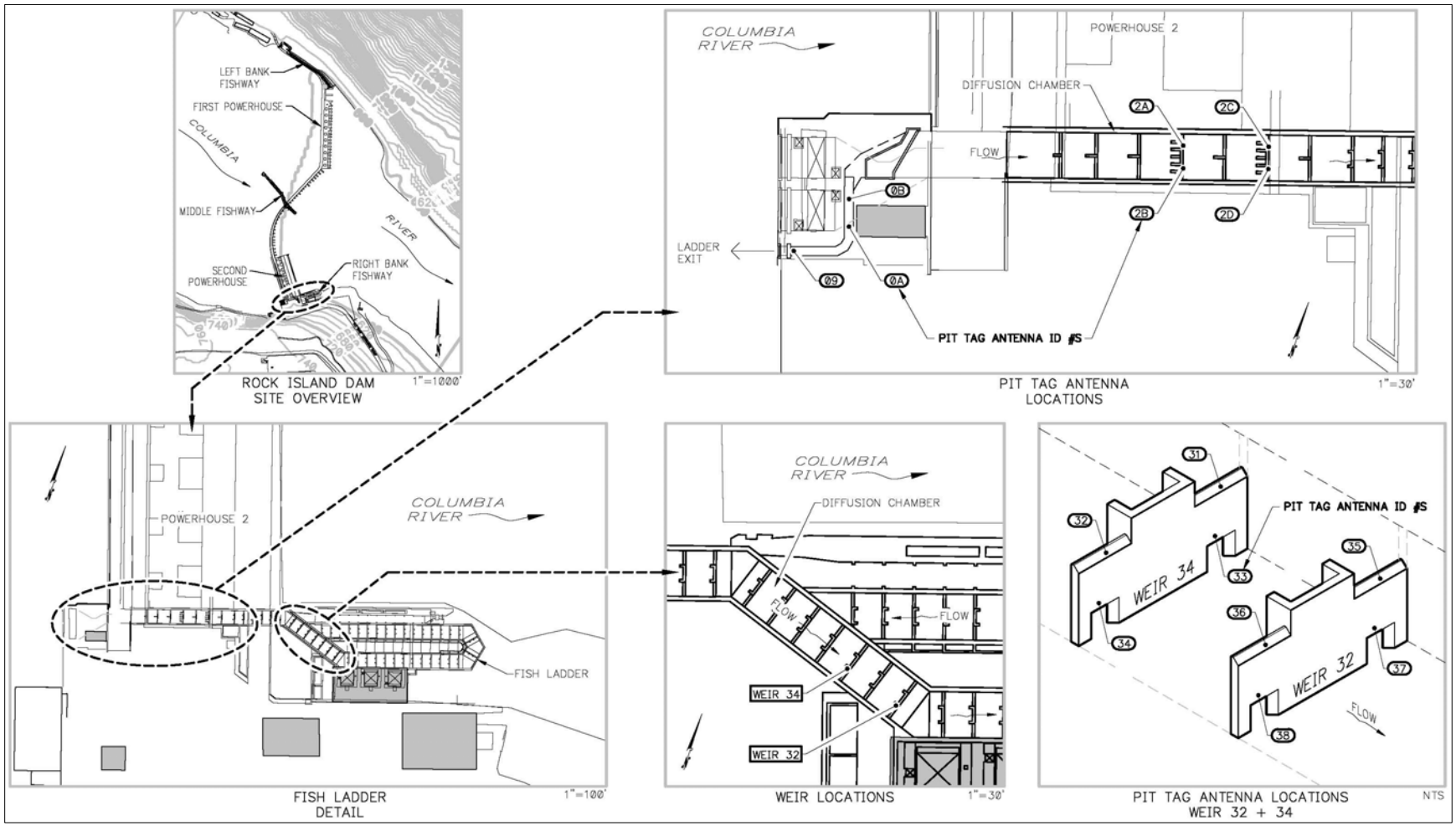
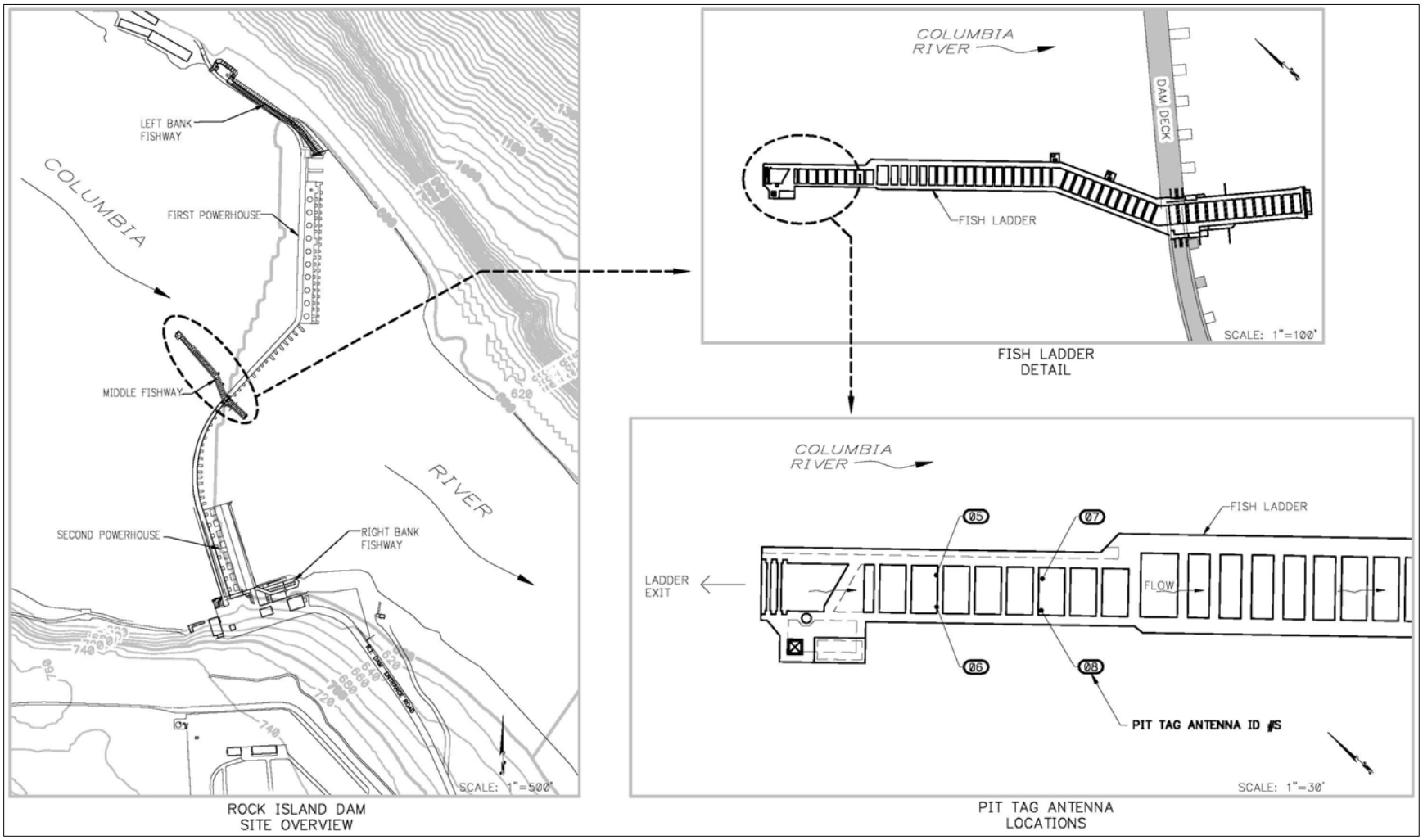


Figure 4-1 Rock Island Dam Fishway Locations



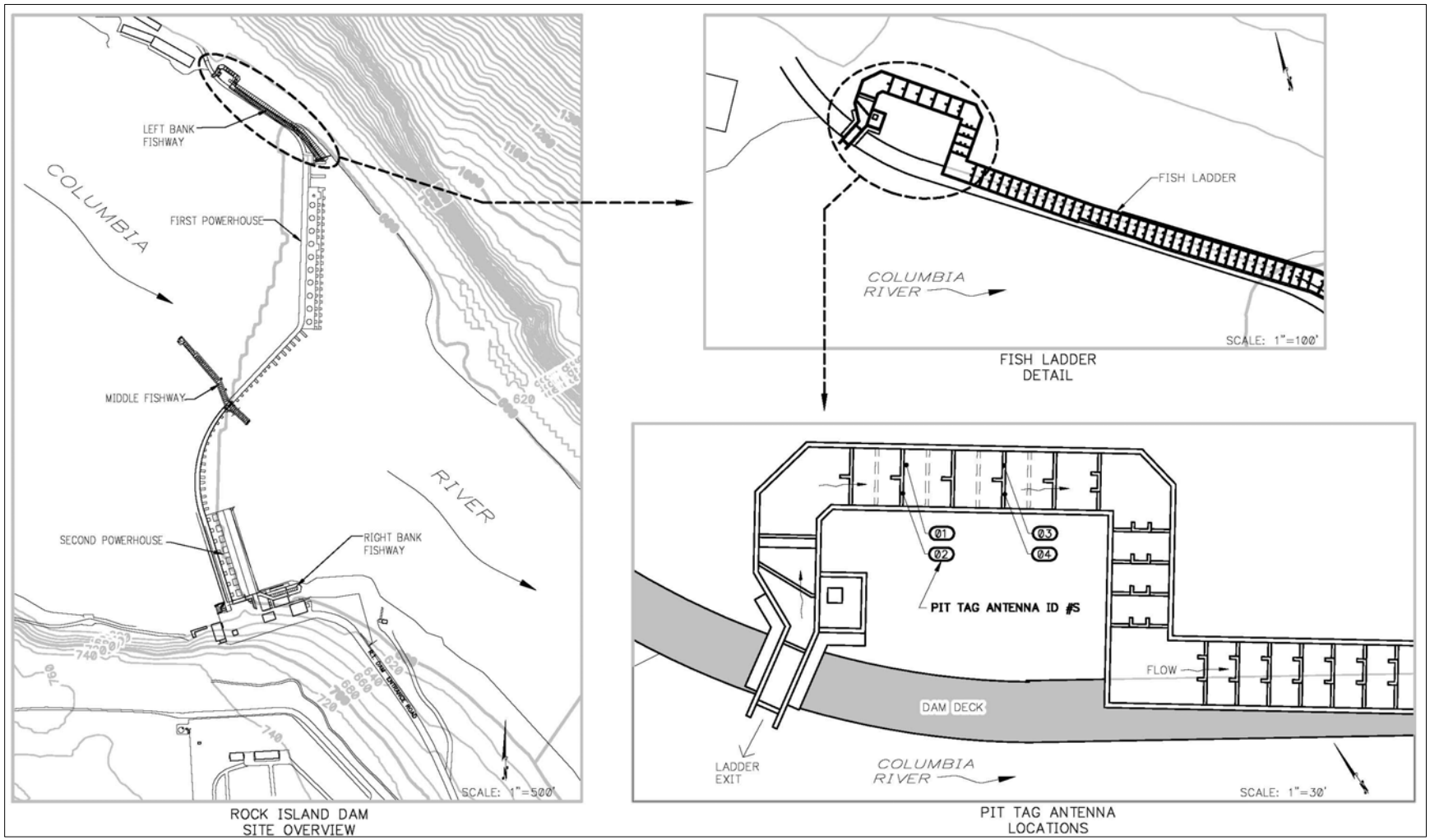
Source: PTAGIS 2022

Figure 4-2 Schematic of the Right Bank Fishway at the Rock Island Dam with Passive Integrated Transponder Arrays Noted.



Source: PTAGIS 2022

Figure 4-3 Schematic of the Middle Fishway at the Rock Island Dam with Passive Integrated Transponder Arrays Noted.



Source: PTAGIS 2022

Figure 4-4 Schematic of the Left Bank Fishway at the Rock Island Dam with Passive Integrated Transponder Arrays Noted.

5.0 EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

Structures and hydrodynamic conditions known to affect passage of adult Pacific Lamprey in fishways of hydroelectric projects have been well studied over the last two decades (Keefer et al. 2012; Clemens et al. 2017; Ackerman et al. 2019). In addition to dozens of passage evaluations at 11 Columbia and Snake River hydroelectric projects (Lê et al. 2020), various assessments of Pacific Lamprey behavior have been conducted to better understand performance across a range of conditions (Mesa et al. 2003; Daigle et al. 2005; Keefer et al. 2010; Keefer et al. 2011; Kirk et al. 2015; Goodman and Reid 2017).

The Pacific Lamprey Conservation Initiative (PLCI) is a collaboration of Native American Tribes, federal, state, municipal and local agencies, and non-governmental organizations working to achieve long-term persistence of Pacific Lamprey, their habitats, and support their traditional tribal use throughout their historical range spanning the West Coast of North America[2]. The Lamprey Technical Workgroup (LTWG), the technical advisory committee of the Pacific Lamprey Conservation Initiative, has developed guidelines on fishway characteristics to facilitate lamprey passage based on the existing body of research (LTWG 2022). Collectively, substantial information exists to inform how various fishway conditions or structures are likely to influence upstream passage of adult Pacific Lamprey.

In 2018, improvements were implemented at the Rock Island Dam fishways based on recommendations from regional experts to improve upstream passage of adult Pacific Lamprey. Weir orifices were evaluated and repaired for potential sharp corner injury (for upstream salmon migration); ladder picket barrier spacing was reduced from 1.0 to 0.625 inches to meet lamprey-specific picket lead spacing recommendations; and entrance gate velocities were reduced from 22:00 to 04:00 from July to October.

Despite the breadth of information on fishways and lamprey behavior, additional information is sought on the influence of the three fishways at Rock Island Dam to adult lamprey passage. Conducting an infrastructure assessment to document the location and extent of steps and sharp edges, grating or picketed leads, and areas of velocity exceeding the swimming speed of lampreys will inform discussions on Pacific Lamprey passage at Rock Island Dam.

[2] https://www.pacificlamprey.org/

6.0 PROJECT NEXUS AND RATIONALE FOR STUDY

Upstream passage of adult Pacific Lamprey at hydroelectric projects can be delayed or obstructed in fishways where lamprey passage was not considered in the original design (Moser et al. 2002). Pacific Lamprey are anguilliform swimmers, often relying on 'burst and attach' movements, velocity refuges, and even climbing on wetted surfaces when available. Because of these characteristics, steps, bulkhead slots, and sharp edges or other 90-degree corners, grating or picketed leads, and areas of velocity exceeding the swimming speed of lampreys can cause delays or obstruction of passage in adult fishways (Keefer et al. 2010, 2011). The current configuration and operation of the Rock Island Dam fishways may therefore delay or reduce upstream passage of adult Pacific Lamprey. This assessment will provide further information to better understand the number and location of specific features in the Project fishways that may influence passage of adult Pacific Lamprey.

7.0 STUDY METHODOLOGY

The Adult Pacific Lamprey Fishway Infrastructure Assessment will include a focused on-site inspection[3] followed by a compilation and interpretation of the observations in a final report (including representative photographs for visual reference). The on-site inspection will focus on the following fishway components and features:

- Entrances: document size and dimensions (e.g., 90-degree corners, bulkhead slots), distance from river bottom, head differential (including any diel or seasonal changes), attraction flows, and estimated water velocity (derived from engineering documentation).
- Collection galleries: document estimated water velocities inside the collection gallery (i.e., portion of fishway between the entrance and series of ascending weirs and pools) and at the inundated portion of the fishway; note size, location, and specifications of any grating, including grating associated with auxiliary water supply or juvenile bypass systems. Any deviations in grating specifications (e.g., broken or lifted corners) will be noted.
- Weirs and orifices: document dimensions and location of orifices, overflow weirs, pools or transition zones, vertical steps, or corners; water velocities in the pools, overflow weirs, and orifices; fishway flooring (e.g., concrete vs. grating) or areas with grating. Surface area characteristics (e.g., material, perforations, etc.) will be noted since they can affect attachment of adult lampreys.
- Count stations: document count station dimensions, velocity, lighting, and picketed leads and specifications, if applicable. Note routes that potentially circumvent enumeration.
- Fishway exits: document dimensions, velocity, and proximity to downstream passage routes, including spill bays and turbine intakes.

Once the fishway infrastructure assessment is completed, a summary of potential areas of concern based on lamprey characteristics and potential fishway obstacles, if any, will be developed (Table 7-1).

[3] Due to safety protocols requiring specific training requirements for entrance and rescue, the on-site inspection will be conducted by CPUD and contracted staff only.

Table 7-1 Summary of Lamprey Characteristics and Potential Fishway Obstacles

LAMPREY CHARACTERISTIC	POTENTIAL FISHWAY OBSTACLE(S)
Mean critical swimming speed of 0.9 meters per second (m/s; 2.8 feet per second [fps]; Mesa et al. 2003).	Velocities at fishway entrances are often 2.1-3.0 m/s (7-10 fps) and 1.8-2.4 m/s (6-8 fps) at submerged orifices. Lampreys can have difficulty negotiating these areas without structures that can be used to their advantage.
"Burst-and-attach" locomotion once velocities reach 0.6 m/s (2.0 fps; Daigle et al. 2005; Keefer et al. 2010).	Velocities that exceed 2.4 to 3.0 m/s (8.2-9.8 fps) likely exceed the ability of adult lampreys to navigate and likely represent a complete barrier.
Limited energetic reserves for migration and spawning (Kirk et al. 2015).	Energy reserves may be depleted for lampreys that repeatedly encounter velocity barriers where burst-and-attach locomotion is required for extended periods.
Nocturnal behavior (Goodman and Reid 2017).	Lighting in fishways or at fish count stations may discourage upstream passage.
Upstream navigation (Porter et al. 2017).	Olfactory cues (e.g., dead fish or artificial compounds) may discourage upstream passage.
Avoidance of high velocities (Keefer et al. 2010).	Potential to become trapped inside of exclusion grating, picketed weirs, and diffusers with gaps that do not limit entry of adult lampreys (e.g., trapped).

Note: Physical dimensions, differentials, attraction flows, and water velocities will be provided where applicable from documented plant hydraulic tables, drawings, and prior studies.

8.0 SCHEDULE, PERIODIC REPORTING, AND ON-GOING CONSULTATION

The Adult Pacific Lamprey Fishway Infrastructure Assessment is anticipated to begin in January 2023 when fishways are dewatered for annual maintenance activities. Draft and final reports will be completed by April and May 2023, respectively.

9.0 LEVEL OF EFFORT AND COST

The fishway infrastructure on-site inspection will be conducted over a period of two to five days at Rock Island Dam during the month of January. On-site inspection, data compilation, interpretation, and reporting is estimated to cost $25,000.

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APPENDIX A CONSULTATION RECORD

Chelan PUD submitted the draft Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan to the Fish and Aquatic Technical Working Group (TWG) (see Table A-1) via email on December 22, 2022 for a 10-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table A-2 below.

Table A-1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
American Rivers	Bridget Moran
Audubon Society	Mark Johnston
Blue Leaf	Dave Robichaud
Blue Leaf	Corey Wright
Bureau of Indian Affairs (BIA)	Keith Hatch
BIA	Stephen Lewis
Cascade Fisheries	Jason Lundgren
Chelan County	Julie Sanderson
Chelan PUD	Alene Underwood
Chelan PUD	Ben Truscott
Chelan PUD	Brian Odell
Chelan PUD	Catherine Willard
Chelan PUD	Janel Ulrich
Chelan PUD	Kate Taylor
Chelan PUD	Lance Keller
Chelan PUD	Marcie Clement
Chelan PUD	Scott Hopkins
Chelan PUD	William Towey
City of Rock Island	Brock Laughlin
Columbia River Inter-Tribal Fish Commission (CRITFC)	Blaine Parker
CRITFC	Carl Merkle
CRITFC	Diane Barton
CRITFC	Julie Carter
CRITFC	Lauri Porter
CRITFC	Tom Skiles
Colville Tribe	Bret Nine
Colville Tribe	Casey Baldwin
Colville Tribe	Douglas Marconi
Colville Tribe	Jason McLellan

ORGANIZATION	NAME
Colville Tribe	Kirk Truscott
Confederated Tribes of the Umatilla Indian Reservation	Audie Huber
Confederated Tribes of the Umatilla Indian Reservation	Brent Hall
Confederated Tribes of the Umatilla Indian Reservation	Aaron Jackson
Confluence Environmental Company	Eric Doyle
DNR	Cindy Preston
DNR	James Huinker
EAS	Cole Lindsey
Ecology	Breean Zimmerman
Ecology	Mark Peterschmidt
Ecology	Tyson Oreiro
Four Peaks	Joe Miller
Four Peaks	Joshua Murauskas
Four Peaks	Leah Nagel
Four Peaks	Pradeep Mugunthan
Golder	Paul Grutter
Individual	Steve Hays
Kearns & West	Angela Hessenius
Kearns & West	Jim Downing
Kearns & West	Katy Kennedy
Kearns & West	Kelsey Rugani
Kearns & West	Mary Beth Day
Kleinschmidt	Audrey Thompson
Kleinschmidt	Jeff Deason
Kleinschmidt	Kai Steimle
Kleinschmidt	MaryLouise Keefe
Kleinschmidt	Nathalie Denis
NOAA	Justin Yeager
NOAA	Scott Carlton
NPCC	Sara Mounts
NPCC	Stacy Horton
UCSRB	Tracy Bowerman
USBR	Gina Hoff
USBR	Shannon Archuleta
USFWS	Jason Romine

ORGANIZATION	NAME
USFWS	Jerrmaine Treadwell
USFWS	Judy Neibauer
USFWS	Kenneth Muir
USFWS	R.D. Nelle
USFWS	Sonja Kokos
USFWS	Tara Callaway
USFWS	William Gale
WA-Parks	Andrew Fielding
WA-Parks	Chelsea Harris
WDFW	Andrew Murdoch
WDFW	Benjamin Blank
WDFW	Chad Jackson
WDFW	Dave Burgess
WDFW	Laura Heironimus
WDFW	Patrick Verhey
Yakama Nation	Brandon Rogers
Yakama Nation	David Blodgett
Yakama Nation	Donella Miller
Yakama Nation	Elaine Harvey
Yakama Nation	Keely Murdoch
Yakama Nation	Ralph Lampman
Yakama Nation	Tom Iverson

Table A-2 Comments Received

Comment #	Comment Date	Name/Entity	Document or Report Name	Stakeholder Comment	Chelan PUD Response
A-1-1	1/05/23	RD Nelle, USFWS Mid-Columbia Fish and Wildlife conservation Office	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	• In section 7, it would be good to add a bullet for Operational Changes. I'd like to see a brief summary of operations and also a summary of expected hydraulics at different settings in the fishways. Ideally, values for entrances, exits, and weir/orifices would be reported.	Anticipated flows or velocity under current FERC permitted operating range (i.e., forebay pool elevation between 609 and 613 ft NGVD 29)will be documented to the extent practicable at entrances, collection galleries, weirs/orifices, count stations, and exits. Values will be based on engineering design documents rather than physical measurements since the evaluation will be conducted when the fishway is dewatered.
A-1-2	1/05/23	RD Nelle, USFWS Mid-Columbia Fish and Wildlife conservation Office	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	• In section 7, they mention that they will document the 90 deg turns at entrances, but I want to clarify that they are also looking at them in the middle of the fishway. The hairpin turns on the left and right bank fishways look like they could be problematic.	All 90 degree turns along the fishway will be documented during the assessment.
A-1-3	1/05/23	RD Nelle, USFWS Mid-Columbia Fish and Wildlife conservation Office	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	• In section 7, the bullet point for weirs and orifices mentions that surface characteristics will be documented. This should be done throughout the entire fishway and not just at weirs/orifices.	Surface characteristics will be documented throughout, including notable conditions that might affect lamprey ability to attach (e.g., degraded, or pitted concrete).
A-1-4	1/05/23	RD Nelle, USFWS Mid-Columbia Fish and Wildlife conservation Office	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	• In section 7, include condition of concrete (e.g., pitting and spalling of concrete)	Surface characteristics will be documented throughout, including notable conditions that might affect lamprey ability to attach (e.g., degraded, or pitted concrete).
A-1-5	1/05/23	RD Nelle, USFWS Mid-Columbia Fish and Wildlife conservation Office	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	• Document the condition and fishway infrastructure with pictures	Infrastructure features will be photographed to document conditions, turning points, etc.
A-2-1	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey	Page 2-1, Line 15/16 changes in text: *"Project operations have the potential to affect use of fishways by adult Pacific Lamprey during upstream migration."*	This Issue Statement was developed by the Fish and Aquatics TWG. It was completed and agreed-upon with stakeholders on July 12, 2022.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
			Fishway Infrastructure Assessment Study Plan		
A-2-2	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 2-1, Line 15 comment: I understand this is one study, but maybe in the introduction you might say that there is a list of studies for lamprey and this addresses x, y, and z, concerns. Please insure looking at effects of pool fluctuations and spill that may occur during adult migration that may cause them to drop back down over the dam. Also, look at the range of pool fluctuations and spills and the potential for stranding adults as water drops to lower levels.	This study is based on the issue statement developed during early engagement by the Fish and Aquatics TWG that states: "Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration." Additional issue statements and potential studies may be discussed further during early engagement and/or during the formal FERC relicensing process.
A-2-3	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 2-1, Line 15 comment: Other life histories can be affected by infrastructure especially downstream moving and rearing juveniles. We know they rear behind Dryden Dam structures, they likely do this in other locations, possibly at Tumwater Dam? But also subadults can be affected during downstream movements, issues and discussions about potential studies address this. It would be good to explain in the Introduction that there are these other issues and that they will be addressed in other studies, so the readers know this is not the only study. Sort of like an overview of the data gaps and how this study addresses just one piece of the list of issues or data gaps	This study is based on the issue statement developed during early engagement by the Fish and Aquatics TWG that states: "Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration." Additional issue statements and potential study plans may be discussed further during early engagement and/or during the formal FERC relicensing process.
A-2-4	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 2-1, Line 16 comment: There were several studies and issues discussed for lamprey. I recall only discussing the idea "of "conversion rates", but rather, the overall passage at the infrastructure. Rates of passage would be part of that. I took a stab at rewording this.	This study is based on the issue statement developed during early engagement by the Fish and Aquatics TWG that states: "Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration." Additional issue statements and potential studies may be discussed further during early engagement and/or during the formal FERC relicensing process.
A-2-5	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 2-1, Line 17 comment: Maybe reword the goal sentence here. The goal is not to address the issue statement, but to develop x, y, and z, types of additional information. (i.e., passage, rate of passage, delay, etc.)	The goal sentence was reworded based on this recommendation.
A-2-6	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway	Page 2-1, Line 18 changes in text: The primary goal of this study is to develop essential additional information necessary to supplement the existing information to address the passage, rates of passage, delay, or ???.	The goal sentence was reworded based on this recommendation.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
			Infrastructure Assessment Study Plan		
A-2-7	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 2-1, Line 18 comment: If this study is to address infrastructure, then address all infrastructure not just the upstream fishways. There is likely adults that get passed downstream over the dam (drop back down). Do you have any idea how much. Please add to this study the other infrastructure at the mainstem dams (i.e. dam, through turbines, through juvenile bypass). Also, other infrastructure associated with the Project included Dryden and Tumwater dams, either add them in to this "infrastructure" study or address them in their own study for adults. Do we know what the passage rate is or are we assuming they have no problems at Dryden? There is likely problems of passing lamprey at Tumwater, both through handling, upstream, and downstream (drop down) movements.	Tumwater Dam, Dryden Dam, and associated fishways and trapping facilities are not Rock Island licensed project works. As such, they are not included in the study.
A-2-8	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 3-1, Line 38 comment: I am also attaching with my comments two documents which may be helpful for Lamprey Conservation that may be helpful. If you can not access them from the shared document tool, I can send them by email One is an Information Resources Document with key online lines to information resources about BMPs, passage, restoration, etc. ; the other is Conservation Recommendations.	Chelan PUD appreciates information from USFWS that will aid in relicensing efforts.
A-2-9	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 4-1, Line 42 comment: If this remains to only be a study for the fish ways, Please add studies about downstream passage, etc....see my comments about other infrastructure and life histories that should be addressed to be able to discuss fish passage and how the project affects lamprey.	This study is based on the issue statement developed during early engagement by the Fish and Aquatics TWG that states: "Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration." Additional issue statements and potential studies may be discussed further during early engagement and/or during the formal FERC relicensing process.
A-2-10	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 5-1, Lines 74-76 comment: Is there reports about how lampreys use the new improvements yet? If so add any information about this would be good to add here. What drove you to make the changes? For example, low numbers passing? or did you find any dead lamprey or injured lamprey? Maybe you have numbers of lamprey that passed through the fishways? You might provide a shore summary of any information or rational here to show either that 1: you are seeing minimal passage and/or 2: you saw an increase, but not much, or just to generally describe what you know about their passage today at your structures.	The District has not studied the efficacy of previously implemented lamprey passage improvements to date, but this study will help identify the effectiveness of lamprey passage generally at the project, including the referenced improvements. Line 73 has been edited to state, "In 2018, improvements were implemented at the Rock Island Dam fishways based on recommendations from regional experts to improve upstream passage of adult Pacific Lamprey."
A-2-11	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult	Page 6-1, Line 89 comment: Also included in this study passage downstream and infrastructure associated that may cause downstream	This study is based on the issue statement developed during early engagement by the Fish and Aquatics TWG that states: "Project

Comment #	Comment Date	Name/Entity	Document or Report Name	Stakeholder Comment	Chelan PUD Response
			Pacific Lamprey Fishway Infrastructure Assessment Study Plan	passage issues around the dam, turbines, juvenile fish sampling/passage structures.	operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration." Additional issue statements and potential studies may be discussed further during early engagement and/or during the formal FERC relicensing process.
A-2-12	1/04/23	Judy Neibauer, USFWS	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	Page 7-1, Line 94 comment: Include downstream moving adults....where might they get stuck if they drop back down over the dam. Include the routes they may travel if entrained over the dam, through the turbines, and through the juvenile bypass. Will need to look at this for subadults moving downstream as well.	This study is based on the issue statement developed during early engagement by the Fish and Aquatics TWG that states: "Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration." Additional issue statements and potential studies may be discussed further during early engagement and/or during the formal FERC relicensing process.
A-3-1	1/12/23[4]	Bryan Mercier, BIA	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	*Section 3.0 Relevant Resource Management Goals or Public Interest Considerations (page 6):* This section highlights numerous plans or public interest considerations emphasizing the management direction of lamprey species. We suggest adding the U.S. Fish and Wildlife Service's Pacific Lamprey 2021 *Regional Implementation Plan for the Upper Columbia Regional Management Unit (Grote 2021)* to this section since the information contained in this document would likely contribute to the infrastructure assessment identified in the Study Plan. Although the mainstem dams in the Columbia River, including the Project, are outside the purview of the Grote (2021) document, it notes that the "combined impacts from the Columbia River dams have greatly reduced the number of adults (lamprey) that can contribute to the tributary adult escapement."	Chelan PUD does not support all the conclusions in the Grote (2021) document, including the conclusions stated in the comment. However, Chelan PUD will include a citation to Grote (2021) in the final study plan, as the document does contain valuable existing information.
A-3-2	1/12/23	Bryan Mercier, BIA	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	*Figure 4-2 (page 9):* Diffusion chambers our delineated in this figure and serve to augment water flow in a fishway and ensure water velocities are in alignment with established criteria for the upstream passage of fish species. Please ensure an assessment of diffusion chambers is specified in Section 7.0 of the Study Plan. In addition, Section 7.0 of the Study Plan discusses the concept of 'collection galleries' in the Project's fishways and their potential effects to Pacific lamprey. To ensure a clear understanding of where these 'collection galleries' are located on the engineering designs for the Project, please note the location of these galleries in Figure 4-2.	The figures used to depict the fishway layout in Section 4 were previously developed for use in PTAGIS and locations of diffusion chambers will be located (confirmed) and evaluated during the assessment. The collection galleries are not easily visible in the existing figures, although a description is now included in line 106 to articulate what is meant by the term (the portion of the fishway upstream from the entrance through the inundated portions of the fishway and weirs).

[4] BIA full comment letter is attached at the end of this Appendix.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
A-3-3	1/12/23	Bryan Mercier, BIA	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	*Section 6.0 Project Nexus and Rationale for Study (page 13):* This section contemplates how "The current configuration and operation of the Rock Island Dam fishways may therefore delay or reduce upstream passage of adult Pacific lamprey. This assessment will provide further information to better understand the number and location of specific features in the Project fishways that may influence passage of adult Pacific lamprey." We feel it is important to highlight that fishways such as those at the Project currently present many challenges to adult upstream passage at hydroelectric projects since they were originally designed for the upstream passage of salmon and steelhead. We therefore recommend the previous statements to read as stated below: *"The current configuration and operation of the Rock Island Dam fishways presents many challenges in deciphering the scope and magnitude of effects to the upstream passage of adult Pacific lamprey. This assessment will provide further information to better understand the number and location of specific features in the Project fishways that influence the passage of adult Pacific lamprey."*	The proposed revision implies project effects ("scope and magnitude of effects"). While the study may identify potential obstacles, there is currently a lack of information on the fishway infrastructure to assert project effects. This study is intended to resolve that lack of knowledge and inform subsequent discussions.
A-3-4	1/12/23	Bryan Mercier, BIA	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	*Section 7.0 Study Methodology (page 14):* The study methodology focuses on many fishway components and features. Specifically, this section notes "weirs and orifices" which may impede Pacific lamprey upstream passage at the Project. Due to the 'burst and attach' mode of locomotion that Pacific lamprey utilize during upstream migration, they typically have trouble navigating and transitioning upstream through these numerous weirs and orifices contained in fishways such as those at the Project. As such, we recommend inserting an additional component to this section which analyzes the potential effect(s) of "transition zones" on Pacific lamprey at the Project.	"Transition zones," or areas in between weirs (pools), was clarified in the final study plan based on this recommendation.
A-3-5	1/12/23	Bryan Mercier, BIA	Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan	We also noted in this section there is no consideration of fishway salvage activities in the Study Plan and its potential effects on lamprey upstream migration at the Project. Typically, fish species including, but not limited to other species such as Pacific lamprey, are salvaged from fishways during winter outages when maintenance activities are conducted. The individuals collected during these outages are either released above the Project or below, depending on the species. Please ensure the potential effects of salvage activities on Pacific lamprey are considered in this section.	This study is based on the issue statement developed during early engagement by the Fish and Aquatics TWG that states: "Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration." Additional issue statements and potential studies may be discussed further during early engagement and/or during the formal FERC relicensing process.
A-3-6	1/12/23	Bryan Mercier, BIA	Rock Island Relicensing Adult Pacific Lamprey	Finally, this section is highlighted by a footnote which describes the context of on-site inspections in the following context, "Due to safety protocols requiring specific training requirements for entrance and	As stated in this plan, and discussed further during the December 19, 2022 Pacific Lamprey TWG Subteam meeting, Chelan PUD determined that safety concerns precluded the option to include outside entities in

Comment #	Comment Date	Name/Entity	Document or Report Name	Stakeholder Comment	Chelan PUD Response
			Fishway Infrastructure Assessment Study Plan	rescue, the on-site inspection will be conducted by CPUD (Chelan PUD) and contracted staff only. As BIA detailed during the December 19, 2022 meeting, on-site inspections of fishways by the Tribes and agencies provide a level of detail and interaction with Chelan PUD staff not provided in documents and photos. We, therefore, strongly encourage on-site inspections of the Project's fishways for all applicable Tribes and agencies. BIA would be willing to attend and complete any necessary training requirements to accommodate our presence at these on-site inspections.	the on-site inspection. Beyond the specific training requirements, Chelan PUD limits entry into potentially hazardous environments, such as the fishways, to the greatest extent possible to limit exposure to potential health and safety hazards. Chelan PUD intends to provide photos and detailed quantitative characterization of conditions observed during the assessment in the assessment report in lieu of providing in-person access to the fishways.
A-4-1	1/04/23	Gina Hoff, USBR	Fishway Infrastructure Assessment Study Plan	I have reviewed the draft Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan, and I have no comments at this time.	Thank you for reviewing the study plan.

Kate Taylor

From: RIRelicensing
Sent: Thursday, December 22, 2022 8:35 AM
To: Marcie Clement; 'jason@ccfeg.org'; 'murk@yakamafish-nsn.gov'; 'bmoran@americanrivers.org'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'tracy.bowerman@ucsrb.org'; 'Andrew.Murdoch@dfw.wa.gov'; 'Patrick.Verhey@dfw.wa.gov'; RIRelicensing; 'Nathalie.Denis@Kleinschmidtgroup.com'; 'Sonja_Kokos@fws.gov'; 'hare@yakamafish-nsn.gov'; 'kai.steimle@kleinschmidtgroup.com'; 'andrew.fielding@parks.wa.gov'; Alene Underwood; 'Audrey.Thompson@kleinschmidtgroup.com'; 'Benjamin.Blank@dfw.wa.gov'; Bill Towey; 'rogb@yakamafish-nsn.gov'; 'brenthall@ctuir.org'; Brian Odell; Catherine Willard; 'chad.jackson@dfw.wa.gov'; 'Chelsea.Harris@parks.wa.gov'; 'cindy.preston@dnr.wa.gov'; 'dave.burgess@dfw.wa.gov'; 'blod@yakamafish-nsn.gov'; 'mild@yakamafish-nsn.gov'; 'James.Huinker@dnr.wa.gov'; 'keith.hatch@indianaffairs.gov'; Lance Keller; 'laura.heironimus@dfw.wa.gov'; 'marylouise.keefe@kleinschmidtgroup.com'; 'lamr@yakamafish-nsn.gov'; 'RD_Nelle@fws.gov'; Scott Hopkins; 'shorton@nwcouncil.org'; 'sghays51@msn.com'; 'ivet@yakamafish-nsn.gov'; 'william_gale@fws.gov'; 'judy_neibauer@fws.gov'; 'jason.mclellan@colvilletribes.com'; 'bret.nine@colvilletribes.com'; 'aaronjackson@ctuir.org'; 'justin.yeager@noaa.gov'; 'porl@critfc.org'; 'Casey.Baldwin@colvilletribes.com'; 'Douglas.Marconi@colvilletribes.com'; 'scott.carlon@noaa.gov'; 'mape461@ecy.wa.gov'; 'skit@critfc.org'; 'pmugunthan@fourpeaksenv.com'; 'ghoff@usbr.gov'; 'cwright@lgl.com'; 'drobichaud@lgl.com'; 'AudieHuber@ctuir.org'; 'jmiller@fourpeaksenv.com'; 'SMounts@NWCouncil.org'; 'tore461@ecy.wa.gov'; 'AHessenius@kearnswest.com'; 'krugani@kearnswest.com'; 'Paul_Grutter@golder.com'; 'eric.doyle@confenv.com'; 'mbday@kearnswest.com'; 'jdowning@kearnswest.com'; 'carj@critfc.org'; Ben Truscott; 'kenneth_muir@fws.gov'; 'toxostoma495@gmail.com'; Janel Ulrich; Kate Taylor; 'sarchuleta@usbr.gov'; 'julie.sanderson@co.chelan.wa.us'; 'bladescodeservices@yahoo.com'; 'bard@critfc.org'; 'parb@critfc.org'; 'lnagel@fourpeaksenv.com'; 'kkennedy@kearnswest.com'; 'stephen.lewis@bia.gov'; 'jmurauskas@fourpeaksenv.com'; 'jeff.deason@kleinschmidtgroup.com'; 'cole.lindsey@easbio.com'; 'CarlMerkle@ctuir.org'; 'jason_romine@fws.gov'; 'jerrmaine_treadwell@fws.gov'; 'tara_callaway@fws.gov'
Subject: RI Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan-Comment Opportunity

Good morning,

Here is the link to comment on the Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan.
Click the link to access the document and submit your comments.

Comments are to be submitted by EOD Friday, January 6, 2023.

Thank you for your participation.

Kate Taylor
Licensing & Compliance Specialist
Chelan PUD
[M] 509-899-5555

Kate Taylor

From: RIRelicensing
Sent: Wednesday, January 4, 2023 8:44 AM
To: RIRelicensing; Marcie Clement; 'jason@ccfeg.org'; 'murk@yakamafish-nsn.gov'; 'bmoran@americanrivers.org'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'tracy.bowerman@ucsrb.org'; 'Andrew.Murdoch@dfw.wa.gov'; 'Patrick.Verhey@dfw.wa.gov'; 'Nathalie.Denis@Kleinschmidtgroup.com'; 'Sonja_Kokos@fws.gov'; 'hare@yakamafish-nsn.gov'; 'kai.steimle@kleinschmidtgroup.com'; 'andrew.fielding@parks.wa.gov'; Alene Underwood; 'Audrey.Thompson@kleinschmidtgroup.com'; 'Benjamin.Blank@dfw.wa.gov'; Bill Towey; 'rogb@yakamafish-nsn.gov'; 'brenthall@ctuir.org'; Brian Odell; Catherine Willard; 'chad.jackson@dfw.wa.gov'; 'Chelsea.Harris@parks.wa.gov'; 'cindy.preston@dnr.wa.gov'; 'dave.burgess@dfw.wa.gov'; 'blod@yakamafish-nsn.gov'; 'mild@yakamafish-nsn.gov'; 'James.Huinker@dnr.wa.gov'; 'keith.hatch@indianaffairs.gov'; Lance Keller; 'laura.heironimus@dfw.wa.gov'; 'marylouise.keefe@kleinschmidtgroup.com'; 'lamr@yakamafish-nsn.gov'; 'RD_Nelle@fws.gov'; Scott Hopkins; 'shorton@nwcouncil.org'; 'sghays51@msn.com'; 'ivet@yakamafish-nsn.gov'; 'william_gale@fws.gov'; 'judy_neibauer@fws.gov'; 'jason.mclellan@colvilletribes.com'; 'bret.nine@colvilletribes.com'; 'aaronjackson@ctuir.org'; 'justin.yeager@noaa.gov'; 'porl@critfc.org'; 'Casey.Baldwin@colvilletribes.com'; 'Douglas.Marconi@colvilletribes.com'; 'scott.carlon@noaa.gov'; 'mape461@ecy.wa.gov'; 'skit@critfc.org'; 'pmugunthan@fourpeaksenv.com'; 'ghoff@usbr.gov'; 'cwright@lgl.com'; 'drobichaud@lgl.com'; 'AudieHuber@ctuir.org'; 'jmiller@fourpeaksenv.com'; 'SMounts@NWCouncil.org'; 'tore461@ecy.wa.gov'; 'AHessenius@kearnswest.com'; 'krugani@kearnswest.com'; 'Paul_Grutter@golder.com'; 'eric.doyle@confenv.com'; 'mbday@kearnswest.com'; 'jdowning@kearnswest.com'; 'carj@critfc.org'; Ben Truscott; 'kenneth_muir@fws.gov'; 'toxostoma495@gmail.com'; Janel Ulrich; Kate Taylor; 'sarchuleta@usbr.gov'; 'julie.sanderson@co.chelan.wa.us'; 'bladescodeservices@yahoo.com'; 'bard@critfc.org'; 'parb@critfc.org'; 'lnagel@fourpeaksenv.com'; 'kkennedy@kearnswest.com'; 'stephen.lewis@bia.gov'; 'jmurauskas@fourpeaksenv.com'; 'jeff.deason@kleinschmidtgroup.com'; 'cole.lindsey@easbio.com'; 'CarlMerkle@ctuir.org'; 'jason_romine@fws.gov'; 'jerrmaine_treadwell@fws.gov'; 'tara_callaway@fws.gov'
Subject: RE: RI Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan - Comment Opportunity

Good morning,

Reminder to please review and provide comments for the RI Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan by end of day Friday this week.

Thank you,

Kate Taylor
Licensing & Compliance Specialist

Search Comment Items

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan

Chelan County PUD invites stakeholders to provide comments on our draft study plan. Please review the document (click "review document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

Your Comment

Comments can be submitted through an attachment or provided directly in the space below.

Review Document

Insert comments on Rock Island Relicensing Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan

Upload File

Uploading a file is optional

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment, please contact the person listed at the bottom of this page.

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United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
Northwest Regional Office
911 Northeast 11th Avenue
Portland, Oregon 97232

January 12, 2023

IN REPLY REFER TO:
NATURAL RESOURCES
ROCK ISLAND HYDROELECTRIC PROJECT

Ben Truscott
Licensing and Natural Science Project Manager
Public Utility District No. 1 Chelan County
327 N. Wenatchee Avenue
Wenatchee, Washington 98801

Dear Mr. Truscott:

Thank you for the opportunity to provide comments on the December 2022 Adult Pacific Lamprey Fishway Infrastructure Assessment Study Plan (Study Plan) for the Rock Island Hydroelectric Project (FERC No. 943) (Project), owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD).

As you are aware, the Bureau of Indian Affairs (BIA) has been intimately involved in the preliminary stages of relicensing the Project and will continue to be an active participant as Chelan PUD utilizes the Federal Energy Regulatory Commission's Integrated Licensing Process (ILP) in pursuit of a new operating license for the Project. The BIA's mission is to enhance the quality of life, to promote economic opportunity, and to carry out the responsibility to protect and improve the trust assets of American Indians, Indian tribes and Alaska Natives. In this instance, we assist in minimizing the impact of the Project on tribal trust resources in close coordination with the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation) and the Confederated Tribes of the Colville Reservation, collectively the Tribes.

BACKGROUND

As summarized in the Study Plan, it is based on an issue statement developed during the "early engagement stage" of relicensing that states:

"*Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration. The primary goal of this study is to develop essential additional information necessary to supplement the existing information to address the issue statement. The specific objective of this study is to characterize physical infrastructure conditions within the three fishways at the Project that have the potential to affect both upstream passage success and enumeration of adult Pacific Lamprey (Entospshenus tridentatus)"* (page 5).

As recently as December 19, 2022, the BIA and the Tribes attended a Pacific lamprey technical work group meeting to provide comments on the draft version of the Study Plan and chart a course for its implementation in 2023. The BIA and the Tribes provided numerous verbal comments on the Study Plan during the December 19, 2022 meeting. While we recognize the

challenges of incorporating numerous comments and objectives into a study plan at such an early phase of relicensing, the BIA does not fully understand the decision-making process for Chelan PUD's incorporation of comments and additional objectives into subsequent drafts of study plans for the Project, including the subject Study Plan. We highlight the importance of this issue and early implementation of studies since FERC's ILP guidelines entail expedited and truncated timelines for study plan development and implementation. Therefore, early identification of Project impacts on tribal trust resources entailing a clear step-wise process for the incorporation of comments is a high priority to the BIA, and impacts to the Pacific lamprey is no exception.

As your Study Plan discusses and references, the FERC record for hydroelectric projects is replete with information describing how the current distribution of Pacific lamprey in the Columbia River and its tributaries extends to Chief Joseph Dam and to Hells Canyon Dam on the Snake River. Although adult lamprey counting at mainstem Columbia and Snake River hydroelectric facilities has generally improved in recent years, population trends still indicate troubling trends, and effects to Pacific lamprey resulting from the operation and maintenance of the Project need to be factored into this equation. The former distribution of lamprey was likely broader than anadromous salmonids due to the ability of lamprey to cling to rocks and pass around slides or falls. Lastly, Pacific lamprey were and still are highly regarded culturally and religiously by Native American tribes. Former lamprey abundance provided tribal fishing opportunities throughout Columbia River Basin tributaries.

To make a more complete Study Plan for the assessment of the fishway infrastructure at the Project for Pacific lamprey, we offer the following comments and recommendations contained herein for your consideration:

SPECIFIC COMMENTS

Section 3.0 Relevant Resource Management Goals or Public Interest Considerations (page 6): This section highlights numerous plans or public interest considerations emphasizing the management direction of lamprey species. We suggest adding the U.S. Fish and Wildlife Service's *Pacific Lamprey 2021 Regional Implementation Plan for the Upper Columbia Regional Management Unit* (Grote 2021) to this section since the information contained in this document would likely contribute to the infrastructure assessment identified in the Study Plan. Although the mainstem dams in the Columbia River, including the Project, are outside the purview of the Grote (2021) document, it notes that the "combined impacts from the Columbia River dams have greatly reduced the number of adults (lamprey) that can contribute to the tributary adult escapement."

Figure 4-2 (page 9): Diffusion chambers our delineated in this figure and serve to augment water flow in a fishway and ensure water velocities are in alignment with established criteria for the upstream passage of fish species. Please ensure an assessment of diffusion chambers is specified in Section 7.0 of the Study Plan. In addition, Section 7.0 of the Study Plan discusses the concept of 'collection galleries' in the Project's fishways and their potential effects to Pacific lamprey. To ensure a clear understanding of where these 'collection galleries' are located on the engineering designs for the Project, please note the location of these galleries in Figure 4-2.

Section 6.0 Project Nexus and Rationale for Study (page 13): This section contemplates how "The current configuration and operation of the Rock Island Dam fishways may therefore delay or reduce upstream passage of adult Pacific lamprey. This assessment will provide further information to better understand the number and location of specific features in the Project fishways that may influence passage of adult Pacific lamprey." We feel it is important to highlight that fishways such as those at the Project currently present many challenges to adult upstream passage at hydroelectric projects since they were originally designed for the upstream passage of salmon and steelhead. We therefore recommend the previous statements to read as stated below:

"*The current configuration and operation of the Rock Island Dam fishways presents many challenges in deciphering the scope and magnitude of effects to the upstream passage of adult Pacific lamprey. This assessment will provide further information to better understand the number and location of specific features in the Project fishways that influence the passage of adult Pacific lamprey*."

Section 7.0 Study Methodology (page 14): The study methodology focuses on many fishway components and features. Specifically, this section notes "weirs and orifices" which may impede Pacific lamprey upstream passage at the Project. Due to the 'burst and attach' mode of locomotion that Pacific lamprey utilize during upstream migration, they typically have trouble navigating and transitioning upstream through these numerous weirs and orifices contained in fishways such as those at the Project. As such, we recommend inserting an additional component to this section which analyzes the potential effect(s) of "transition zones" on Pacific lamprey at the Project.

We also noted in this section there is no consideration of fishway salvage activities in the Study Plan and its potential effects on lamprey upstream migration at the Project. Typically, fish species including, but not limited to other species such as Pacific lamprey, are salvaged from fishways during winter outages when maintenance activities are conducted. The individuals collected during these outages are either released above the Project or below, depending on the species. Please ensure the potential effects of salvage activities on Pacific lamprey are considered in this section.

Finally, this section is highlighted by a footnote which describes the context of on-site inspections in the following context, "Due to safety protocols requiring specific training requirements for entrance and rescue, the on-site inspection will be conducted by CPUD (Chelan PUD) and contracted staff only. As BIA detailed during the December 19, 2022 meeting, on-site inspections of fishways by the Tribes and agencies provide a level of detail and interaction with Chelan PUD staff not provided in documents and photos. We, therefore, strongly encourage on-site inspections of the Project's fishways for all applicable Tribes and agencies. BIA would be willing to attend and complete any necessary training requirements to accommodate our presence at these on-site inspections.

SUMMARY COMMENTS

The BIA looks forward to continued coordination with Chelan PUD, Tribes, and resource agencies in the finalization and implementation of the Study Plan. Please ensure any relevant consultation with the Tribes has been completed prior to the finalization of the Study Plan.

Our comments reflect the information available at the time of this review and may be revised in the event additional information become available in the final implementation of the Study Plan.

If you have questions or concerns, please contact Steve Lewis, Regional Hydropower Program Manager, at (503) 231-6711or stephen.lewis@bia.gov.

Sincerely,

Bryan K. Mercier, Regional Director

Bryan Mercier
Northwest Regional Director

cc: Ralph Lampman, Yakama Nation
Kirk Truscott, Colville Tribes
Patrick Verhey, WDFW
Laura Heironimus, WDFW
Jennifer Frozena, Solicitor's Office

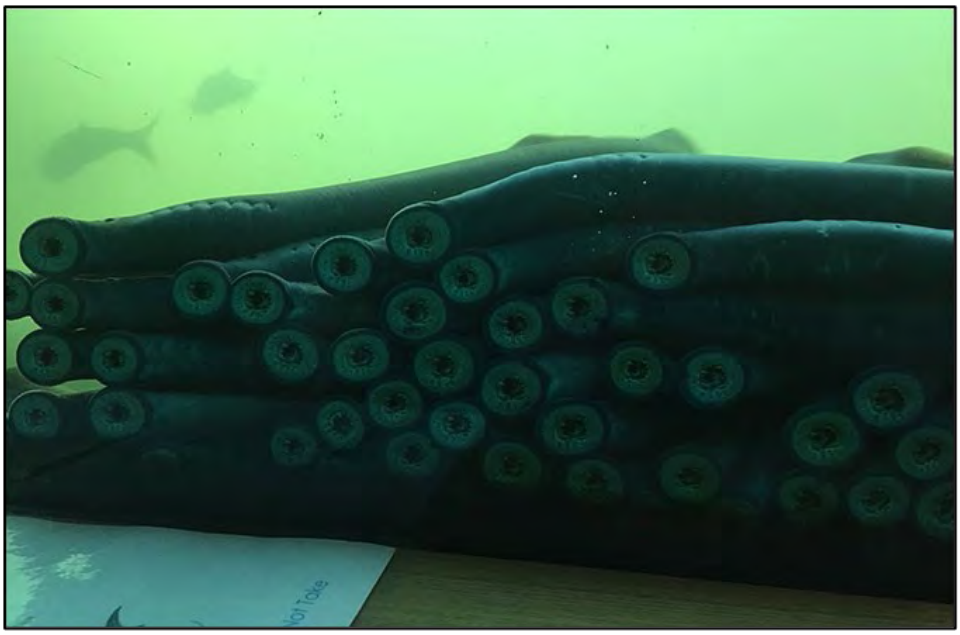
LITERATURE CITED:

Grote, Ann. 2021. Pacific Lamprey Regional Implementation Plan for the Upper Columbia Regional Management Unit. Submitted to the Conservation Team September 2, 2021. Primary Author: Ann Grote, U.S. Fish and Wildlife Service. 24pp.

ADULT PACIFIC LAMPREY INFRASTRUCTURE ASSESSMENT REPORT

ROCK ISLAND HYDROELECTRIC PROJECT

FERC No. 943



Source: Lindsey Wise, Portland State University

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

June 2023

ADULT PACIFIC LAMPREY INFRASTRUCTURE ASSESSMENT REPORT

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

FOUR PEAKS ENVIRONMENTAL SCIENCE & DATA SOLUTIONS
338 S. MISSION STREET
WENATCHEE, WA 98801

June 2023

TABLE OF CONTENTS

LIST OF FIGURES

TERMS AND ABBREVIATIONS

A	
AWS	attraction water supply
C	
Chelan PUD	Public Utility District No. 1 of Chelan County
F	
FERC	Federal Energy Regulatory Commission
I	
ILP	Integrated Licensing Process
L	
LTWG	Lamprey Technical Working Group
P	
PH2	Powerhouse 2
PIT	passive integrated transponder
R	
RL	river left (left side of the river if looking downstream)
RM	river mile
RR	river right (right side of river if looking downstream)
Rock Island Project	Rock Island Hydroelectric Project FERC No. 943

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Rock Island Project; Federal Energy Regulatory Commission [FERC] Project No. 943). The Rock Island Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Rock Island Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Rock Island Project, which will use the Integrated Licensing Process (ILP). Chelan PUD intends to incorporate the findings of this report in the Pre-Application Document, which will be filed with FERC and distributed to relicensing participants when the ILP commences in late 2023.

This study, which was developed in consultation with the Fish & Aquatic Technical Work Group, was conducted in support of the Rock Island Project relicensing, as described in the Adult Lamprey Infrastructure Assessment Study Plan (Four Peaks 2023). This report presents findings from the assessment conducted in early 2023.

1.1 Background Information

Structures and hydrodynamic conditions known to affect passage of adult Pacific Lamprey (*Entosphenus tridentatus*) in fishways of hydroelectric projects have been well studied over the last two decades (Keefer et al. 2012; Clemens et al. 2017; Ackerman et al. 2019). In addition to dozens of passage evaluations at 11 Columbia and Snake River hydroelectric projects (Lê et al. 2020), various assessments of Pacific Lamprey behavior have been conducted to better understand performance across a range of conditions (Mesa et al. 2003; Daigle et al. 2005; Keefer et al. 2010 and 2011; Kirk et al. 2015; Goodman and Reid 2017).

The Pacific Lamprey Conservation Initiative is a collaboration of Native American Tribes; federal, state, municipal, and local agencies; and non-governmental organizations working to achieve long-term persistence of Pacific Lamprey, their habitats, and support their traditional tribal use throughout their historical range spanning the West Coast of North America. The Lamprey Technical Workgroup (LTWG), the technical advisory committee of the Pacific Lamprey Conservation Initiative, has developed guidelines on fishway characteristics to facilitate lamprey passage based on the existing body of research (LTWG 2022). Collectively, substantial information exists to inform how various fishway conditions or structures are likely to influence upstream passage of adult Pacific Lamprey.

In 2018, Chelan PUD implemented improvements at the Rock Island Dam fishways. Weir orifices were evaluated and repaired for potential sharp corner injury (for upstream salmon migration); fishway picket barrier spacing was reduced from 1 to 0.625 in. to meet lamprey-specific picket lead spacing recommendations; and entrance gate differentials were reduced (to a target of 1.0 ft) from 22:00 to 04:00 from July to October.

Despite the breadth of information on fishways and lamprey behavior, the Adult Pacific Lamprey Infrastructure Assessment Study Plan was implemented by Chelan PUD to better understand the influence of the three fishways at Rock Island Dam to adult lamprey passage. This infrastructure assessment report documents the location and extent of steps and sharp edges, grating or picketed leads, and areas of velocity exceeding the swimming speed of lampreys to inform evaluation of Pacific Lamprey passage at Rock Island Dam.

2.0 STUDY GOALS AND OBJECTIVES

The Adult Pacific Lamprey Infrastructure Assessment Study was based upon the issue statement developed during early engagement that states:

> *"Project operations have the potential to affect adult Pacific Lamprey fishway conversion rates during upstream migration."*

The primary goal of the study was to develop additional information necessary to supplement the existing information to address the issue statement. The specific objective of the study was to characterize physical infrastructure conditions within the three fishways at the Rock Island Project that have the potential to affect both upstream passage success and enumeration of adult Pacific Lamprey.

3.0 GEOGRAPHIC SCOPE

The Rock Island Project is located on the Columbia River near the cities of Wenatchee and East Wenatchee in Chelan County and Douglas County, Washington, from river mile (RM) 453.4 to RM 473.7. The study area encompassed the Rock Island Dam adult fishways, shown in Figure 3-1, Figure 3-2, Figure 3-3, and Figure 3-4.

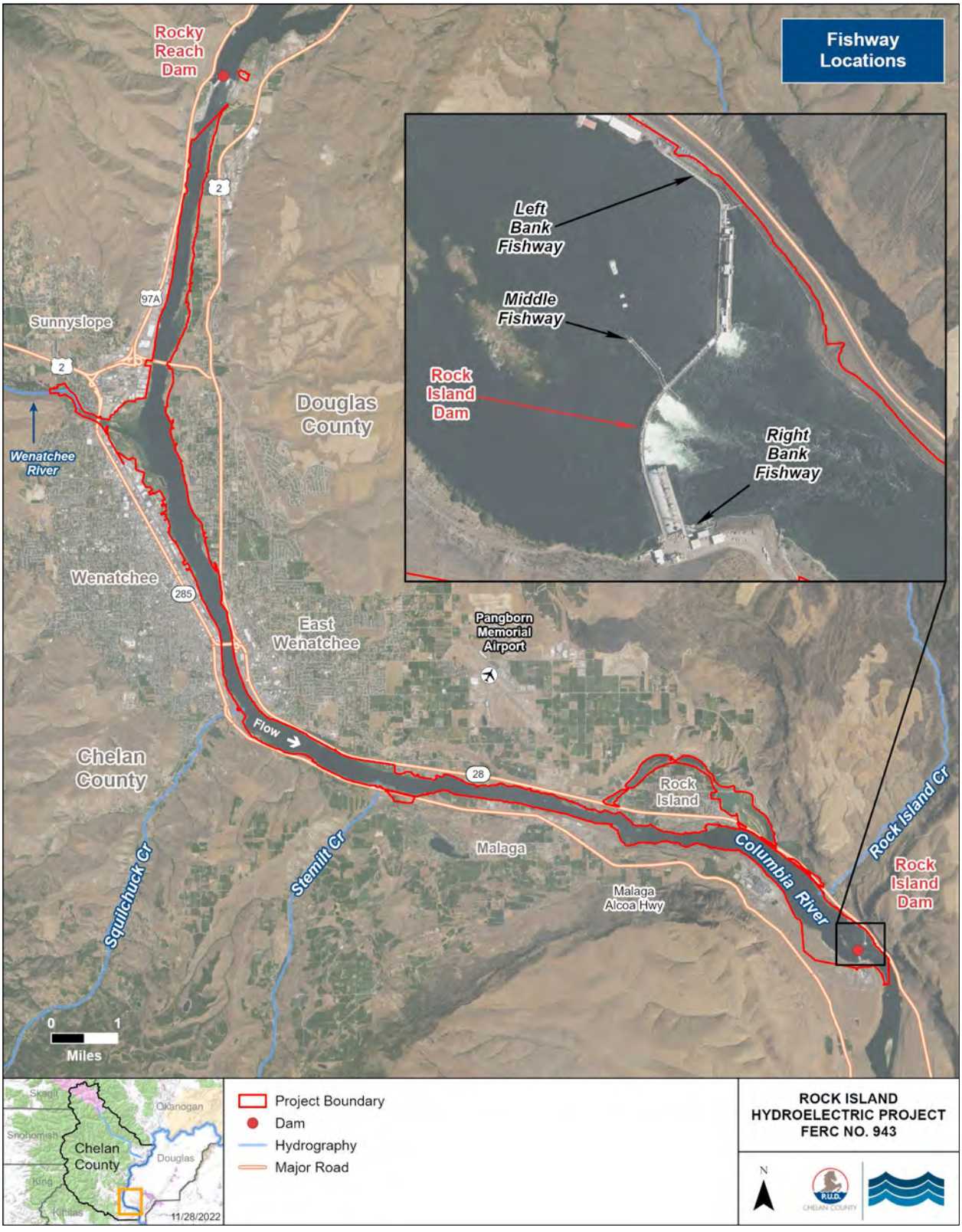


Figure 3-1 Rock Island Dam Fishway Locations

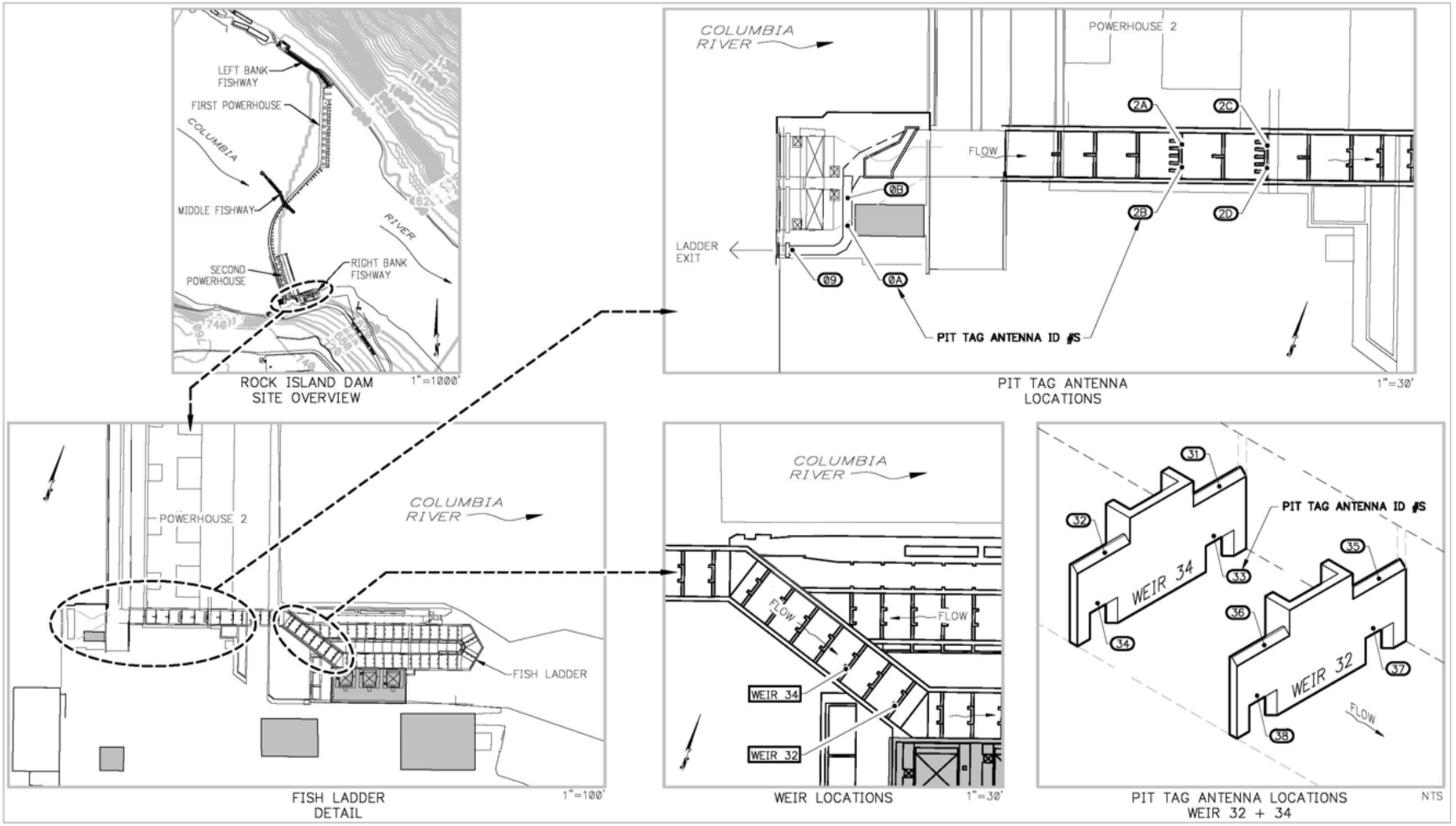


Figure 3-2 Schematic of the Right Bank Fishway at the Rock Island Dam with Passive Integrated Transponder Arrays Noted

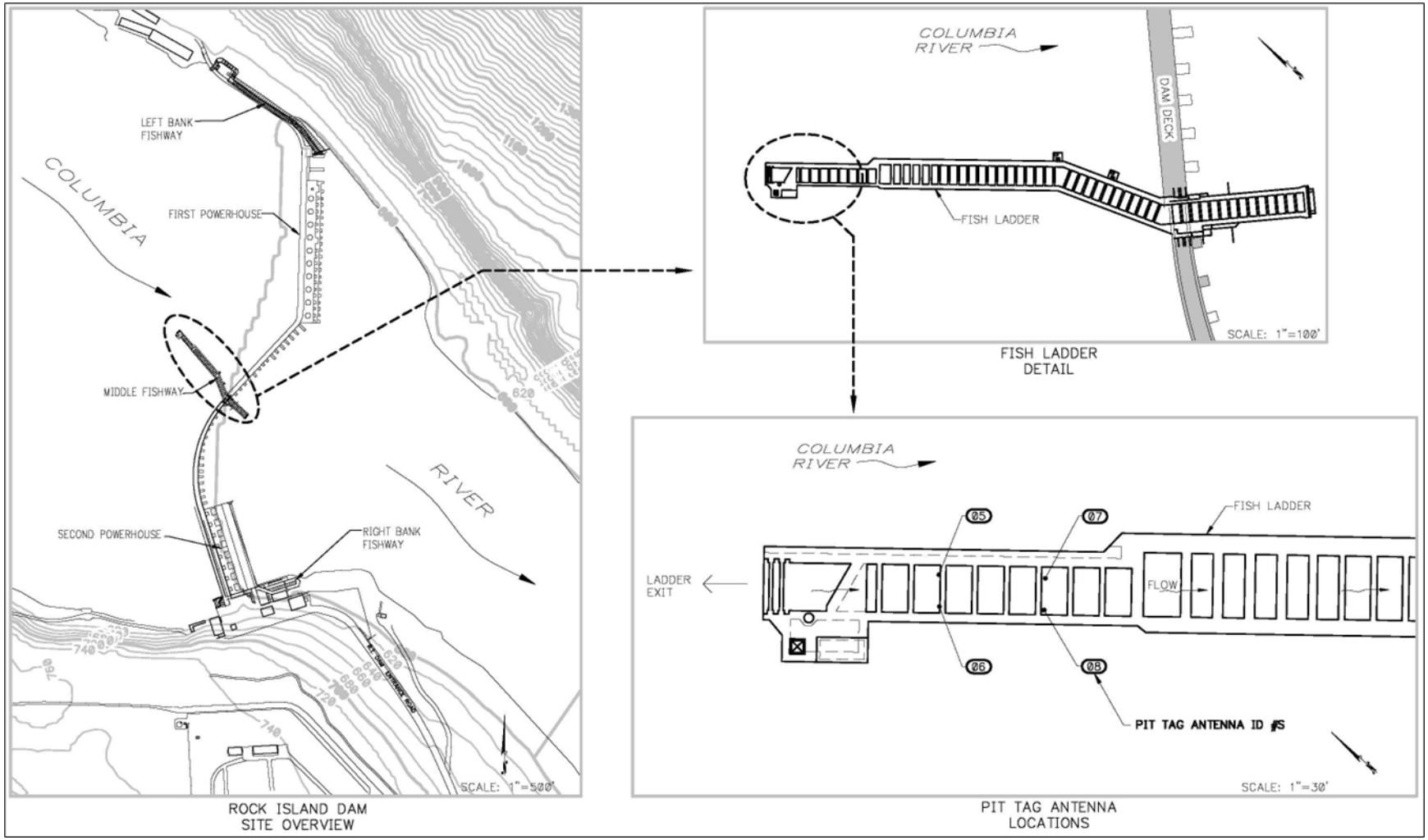


Figure 3-3 Schematic of the Middle Fishway at the Rock Island Dam with Passive Integrated Transponder Arrays Noted

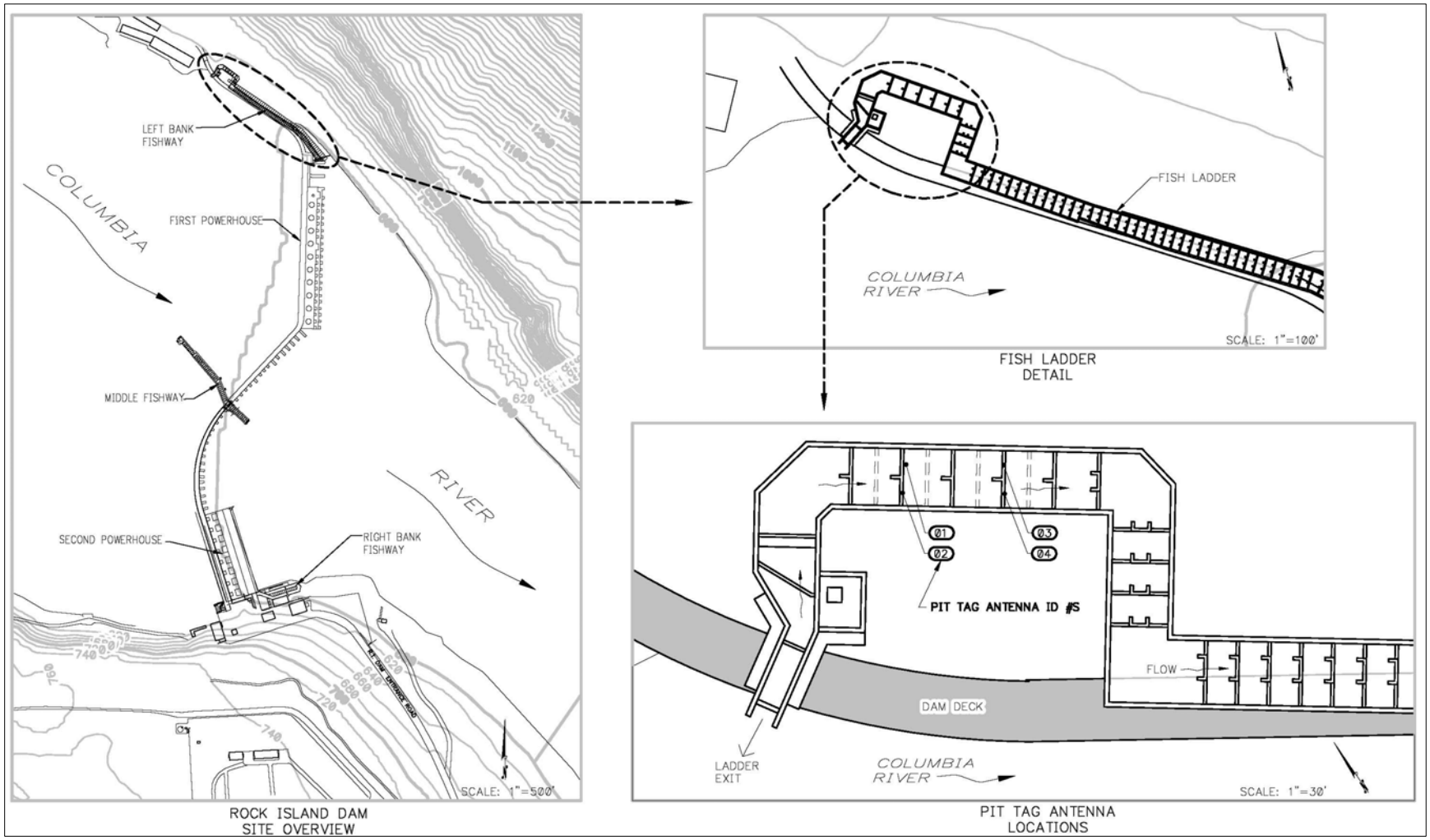


Figure 3-4 Schematic of the Left Bank Fishway at the Rock Island Dam with Passive Integrated Transponder Arrays Noted

4.0 METHODS

The Adult Pacific Lamprey Fishway Infrastructure Assessment included a focused on-site inspection[1] followed by a compilation and interpretation of the observations (including representative photographs for visual reference). The on-site inspection focused on the following fishway components and features:

- Entrances: document size and dimensions (e.g., 90-degree corners, bulkhead slots), distance from river bottom, head differential (including any diel or seasonal changes), attraction flows, and estimated water velocity (derived from engineering documentation).
- Collection galleries: document estimated water velocities inside the collection gallery and at the inundated portion of the fishway; note size, location, and specifications of any grating, including grating associated with attraction water supply or juvenile bypass systems. Any deviations in grating specifications (e.g., broken or lifted corners) were noted.
- Weirs and orifices: document dimensions and location of orifices, overflow weirs, pools, vertical steps or corners; water velocities in the pools, overflow weirs, and orifices; fishway flooring (e.g., concrete vs. grating) or areas with grating. Surface area characteristics (e.g., material, perforations, etc.) were noted.
- Count stations: document count station dimensions, velocity, lighting, and picketed leads and specifications, if applicable. Routes that could potentially allow Pacific Lamprey to circumvent enumeration were noted.
- Fishway exits: document dimensions, velocity, and proximity to downstream passage routes, including spill bays and turbine intakes.

Once the fishway infrastructure assessment was completed, a summary of potential areas of concern based on lamprey characteristics and potential fishway obstacles was developed.

[1] For safety reasons the on-site inspection was conducted by Chelan PUD and contracted staff only.

5.0 RESULTS

The fishway infrastructure assessment was conducted on three dates, each spanning roughly 6 to 8 hours of inspection and covering all infrastructure from the fishway entrances to the exits during the annual dewatering period for routine maintenance. The right fishway was inspected on January 12, 2023, followed by the middle fishway on January 17, 2023, and the left fishway on February 15, 2023. Findings from each fishway are presented individually, starting at the downstream most portion and moving toward the exit. Additional information to supplement the visual inspection was obtained from design drawings and Chelan PUD engineers.

5.1 Left Fishway

5.1.1 Entrance and Collection Galleries

The left fishway includes two 4-feet-wide entrances with slotted gates. A head differential of 1.0 to 1.5 ft is maintained at the fishway entrances. There is attraction water supply (AWS) grating on the fishway floor immediately upstream of the entrance, approximately 16.5-feet-wide by 17 ft in length with a 1.25 in. bar and a 1.18 in. spacing between bars (Figure 5-1 panel A)[2]. This grating is comprised of 12 panels with limited potential attachment points for adult lamprey. The primary source of AWS is supplied to the entrance through these grates. Additional AWS is introduced on the river right (right side of the river if looking downstream; RR) side of the fishway in 13 locations, with the most upstream location in Pool 11, through chimneys (vertically oriented channel) with diffuser panels oriented with the bars facing 45 degrees to the wall face. The paneling for these chimneys have 0.25 in. bar with 1 in. gaps[3]. Vertically-oriented concrete panels with 1 to 2 in. gaps run from Weir 1 to Weir 30 (see Section 5.1.2), beginning 15 ft after the fishway entrance (Figure 5-1 panels A and B; Figure 5-2 panel A). The panels exist above the solid concrete wall on the river left (left side of the river if looking downstream; RL) side of the fishway and have water flowing through them at all times of the year, potentially allowing fish to volitionally move between the fishway and the standing pool along the river bank (Figure 5-1 panel A). At higher tailrace water levels, it is possible that all the vertical panels are inundated, though typical water levels likely restrict inundation to the first 19 weirs. The panels were engineered to improve the structural integrity of the fishway. There is a relief gate in the downstream end of the standing pool outside

[2] AWS grating dimensions in the lower left fishway were not measured during the inspection, as the area was inaccessible. Technical drawings of the fishway indicate the dimensions provided.
[3] Diffuser panel bar dimensions in the lower left fishway were not measured during the inspection, as the area was inaccessible. Technical drawings of the fishway indicate the dimensions provided.

of the fishway that remains closed under normal flow conditions. The first 11 weirs upstream of the entrance do not have orifices (i.e., overflow weirs), though these weirs are inundated throughout the season (Figure 5-1 panel C).

Notes:

Panel A: Channel alongside the lower fishway and associated concrete panels with vertical slots on river right; Panel B: Vertical slots above solid fishway wall on River Right side; Panel C: Example of weirs in Lower Fishway (Pools 1-11).

Figure 5-1 Technical Drawing and Photos of the Left Fishway Entrance

5.1.2 Overflow Section and Flow Regulation

The overflow section of the left fishway includes 58 weirs and pools, followed by a flow regulation section that consists of six baffles and pools immediately downstream of the count station and fishway exit. Water depth over the crest of the overflow weirs is maintained at 1.0 to 1.2 ft. Overflow weirs have two 15 in. by 15 in. orifices. Moving upstream, Weirs 12 and 13 are vertically stepped approximately 20 in., varying slightly along the weir due to variation in substrate deposition. After weir 14, the floor of the fishway transitions from concrete to substrate. From weirs 14-36, the concrete footings for the weir panels were laid into the existing bedrock. As a result, the floor in this portion of the fishway is primarily bedrock, with partial concrete floor present in weirs 19 and 21 (Figure 5-2 panel B). The bedrock floor has greater variability in the surface compared to fishway floor constructed of concrete. The fishway floor in Pools 17 and 18 slopes inward from RR, creating a variable depth within the pool. The fishway typically remains

inundated throughout the entire season through Weir 18. Two orifices are present in each weir beginning at Weir 14 and continuing upstream to Weir 53. These orifices are located away from the fishway walls and are elevated (i.e., perched) at variable heights throughout the fishway, ranging from 12 in. to 4.5 ft (Figure 5-2 panel E). Vertical bulkhead slots along the fishway wall (between Weirs 14 and 58) create a discontinuity in the wall surface. Water velocity is approximately 7.9 ft/s through the submerged orifices and 2.9 ft/s over the crest of the weirs in the overflow section of the fishway[4].

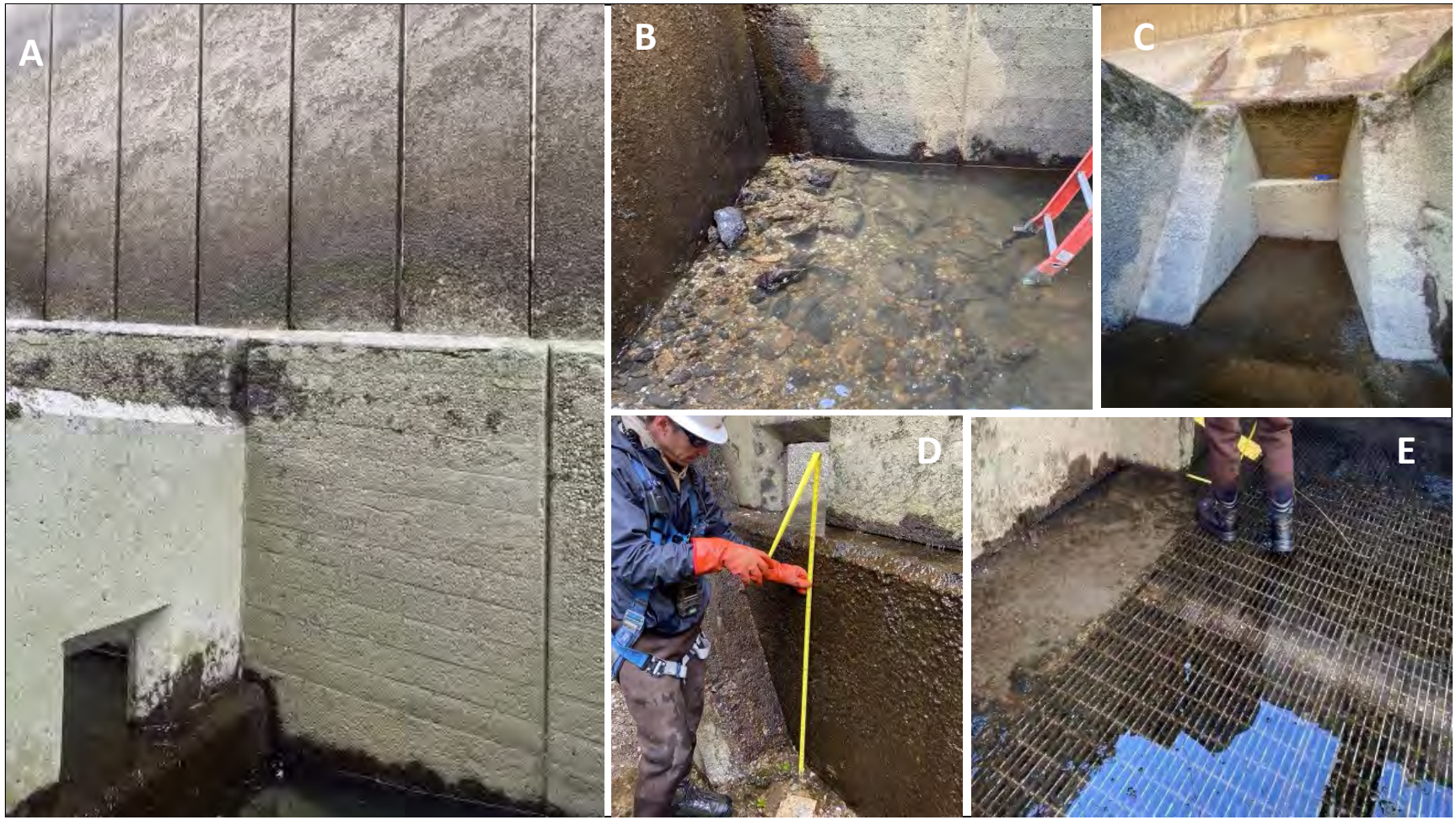
Most of the river right (right side of the river if looking downstream; RR) fishway walls between Weirs 32 and 58 are sloped and have bulkhead slots on the fishway wall immediately downstream of the orifice that are roughly 5 to 15-inches-wide and 3.5 to 4-inches-deep, creating a discontinuity in the wall surface. Pools 36, 40, 44, and 48 have large outcroppings on the RR side that are triangularly shaped, with a large slot in the angled wall (generally 60-inches-wide by 89-inches-deep and 101-inches-tall; Figure 5-2 panel C). There are two unscreened pipes on the RL fishway wall in Pools 30 and 51 that are roughly 6 and 4 in. in diameter, respectively. The termination of these pipes could not be determined during the assessment, but likely present a dead-end route. Pool 53 is more than double the area of the other pools in this fishway and includes two 102-inches-long by 63-inches-wide structures that extend from the floor of the fishway to above the water line on the RR side.

The fishway also makes a 90 degree turn at this pool before continuing to the remainder of the overflow weirs. A ramped depression downstream of Weir 54 creates an 8 in. perch moving upstream. Bulkhead slots exist along the walls from Weirs 54 to 57 that are 2-inches-deep and 7-inches-wide. Weir 56 has a cap on top of the overflow portions of the weir that adds approximately 6 in. in height to the overflow portion of the weir. Weir 58 is not flush with the cut out in the floor of the fishway, creating a discontinuity in the floor surface, including a step downstream of the weir that is 2 in. high.

The flow regulation section begins above Weir 58 and includes diffuser grating that is 109-inches-wide by 170-inches-long. The diffuser grating is 22 in. from the walls and has 0.25 in. bars with 1 in. spacing between bars with limited potential attachment points for adult lamprey (Figure 5-2 panel D). The baffles in the flow regulation section have rectangular orifices that that are oriented

[4] Values presented are calculated based on dimensions measured during the assessment, and assuming 1.0 ft water depth over the crest of the overflow weirs.

vertically and horizontally, where orifice orientation alternates every other baffle. The dimensions of these orifices are generally 36 in. by 20 in. for both orientation types (36-inches-wide by 20-inches-tall for horizontal orientation, and 36-inches-tall by 20-inches-wide for vertical orientation). Vertically oriented orifices are not flush with the wall and perched 14 in. from the floor. Horizontal orifices are flush with the wall and perched 26-30 in. from the floor. The second and fourth baffles have passive integrated transponder (PIT) antennas around the orifice on the upstream side.



Notes:

Panel A: 1 to 2 in. slots between panels to allow for water to flow out of the fishway above weirs; Panel B: Substrate on the floor of the fishway; Panel C: One of four outcroppings on the river right side of the fishway; Panel D: an example of a perched orifice in the overflow section; Panel E: Grating in the diffusion chamber.

Figure 5-2 Overflow Section and Flow Regulation of Left Fishway

5.1.3 Count Station

The count station is located above the pool created by the sixth baffle. The picketed lead immediately downstream of the count station is a 0.5 in. bar with 0.625 in. spacing (Figure 5-3 panel A). There are two partially covered drains flush with the flooring at the bottom of the picketed lead, leading to the upstream side of the trash rack. The drains are covered on the upstream side, creating a dead end approximately 2 ft upstream.

The count station is elevated 39 in. from the fishway floor (Figure 5-3 panel B). There is a bulkhead slot on both sides of the entrance to the window, with channels that are 5-inches-wide and 2.5-inches-deep, creating a discontinuous surface. There is a gap along the edge of the flooring that is roughly 4-inches-wide and 2-inches-long and a gap between the wall and the ceiling that is 1.75-inches-wide, both potentially allowing lampreys to circumvent the count station window. There is another gap between the wall and ceiling of counting channel, potentially allowing lamprey to bypass the count station window (Figure 5-3 panel C). The only artificial lighting in the fishway is from the viewing area of the count station.

Notes:

Panel A: Picketed lead prior to counting station; Panel B: Perched entrance to count station; Panel C: Counting window and channel - red arrow shows gap between wall and ceiling of counting channel where lamprey could potentially avoid the counting station.

Figure 5-3 Count Station of Left Fishway

5.1.4 Fishway Exit

The fishway exit is roughly 32-feet-long. There is fine sediment built up on the floor of the fishway exit. The trash rack panels measure roughly 80-inches-wide by 80-inches-tall and have 0.25 in. bar with 0.5 in. gaps (Figure 5-4 panel A). There are four total panels in a 2 x 2 configuration. Brush strips are installed along panel edges to cover the gap between the panel and wall, although the brush strips only cover gaps on the bottom two panels (Figure 5-4 panel B). Gaps in the areas that do not have brush strips are roughly 1 to 1.5-inches-wide. There are drains with perforated covers immediately below the trash racks.

Notes:
Panel A: Trash racks near the exit of the counting station; Panel B: Gap along the edge of the trash rack; Panel C: Fishway exit to the forebay.

Figure 5-4 Left Fishway Exit

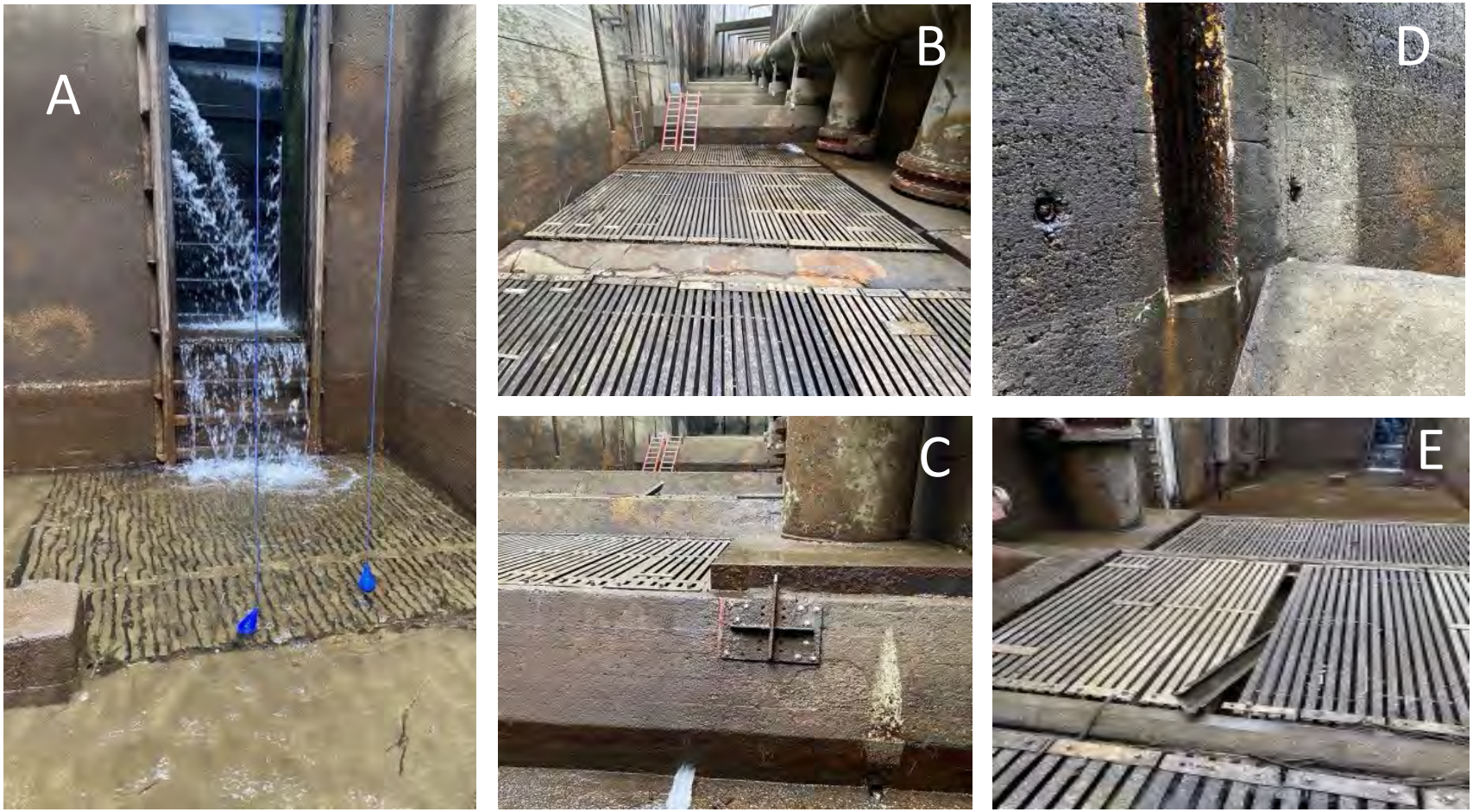
5.2 Middle Fishway

5.2.1 Entrance and Collection Galleries

The middle fishway has two entrances that are approximately 4-feet-wide and 2-feet-wide. A head differential of 1.0 to 1.5 ft is maintained at the fishway entrances. There is grating immediately upstream of the downstream most entrance that measures 116 in. by 128 in. with 2 in. bar and 1 in. gap between bars with limited potential attachment points for adult lamprey (Figure 5-5 panel A). Along the downstream side of this grate (closest to the entrance), there are 4 to 6 in. gaps that

provide an entry point into an area below the grating. The collection gallery has two remnant radiotelemetry bulbs on the RR wall and old stilling wells on RL wall that interrupt an otherwise continuous wall surface. One stilling well has a 1.5 in. opening on its side. The remainder of the stilling well has no place to exit, creating a potential dead-end route.

There is AWS grating on the fishway floor immediately upstream of the entrance (Figure 5-5 panels B, C, and E). There are five locations with grates, all located in the pools between Weir 2 and Weir 6. The first three grates are level with the entrance floor, and the last two grates are stair-stepped between weirs (Figure 5-5 panel B). The grating all has limited potential attachment points for adult lamprey. The first step is 11.5 in. vertically up from the floor before a 34.5 in. ramped section of the step, varying slightly from the following steps (Figure 5-5 panel C). The second and third steps are 18-inches-tall and ramped at an approximately 75-degree angle. Although these stair steps are comparatively shorter in height than weirs in the overflow section, they require adult lampreys to swim over the top since there are no orifices. Each of the five locations where attraction flows are introduced through the floor of the fishway include 12 panels roughly 99 in. by 13.5 in. with 2 in. bar and 1 in. spacing with limited potential attachment points for adult lamprey. The total grated area is 178 in. by 99 in. and is located approximately 60 in. from wall to grate on the RL side. Gaps slightly greater than 1 in. exist throughout the grating where panels meet. There is roughly a 1.5 in. gap on the RR and RL sides of the grates between the panels and the concrete floor. One section of paneling had broken since the last annual fishway maintenance period (January 2022). Chelan PUD maintenance mechanics were preparing to repair the broken section of paneling as the assessment was being conducted (Figure 5-5 panel E). At the first overflow weir, a bulkhead slot on the RL side starts at the top of the overflow crest, creating a discontinuous wall surface (Figure 5-5 panel D).



Notes:

Panel A: Entrance and associated grating; Panel B: AWS grates; Panel C: Stair step system leading up to first overflow weirs; Panel D: Bulkhead slot; Panel E: Broken AWS grate.

Figure 5-5 Entrance and Collection Galleries of Middle Fishway

5.2.2 Overflow Section and Flow Regulation

The overflow section of the middle fishway includes 34 weirs and pools, followed by a flow regulation section that consists of six baffles and pools immediately downstream of the count station and fishway exit. Water depth over the crest of the overflow weir is maintained at 1.0 to 1.2 ft. Weirs include one overflow section that extends from the overflow barrier that rises 27 in. above the overflow section to the fishway wall and a single orifice that generally measures 15 x 15 in. The orifices in each weir vary slightly by location, described below. A prominent observation in the overflow section were eight bulkhead slots along both fishway walls between Weirs 17 and 25 that ranged from 4- to 9-inches-wide and had depths that ranged from 3 to 4 in. (Figure 5-6 panel A). These slots create a discontinuous wall surface from the top of the overflow section of the weir to above the water level. Weirs 26 to 39 have paneled overflow barriers that consist of sections that are 9 in. by 64 in., stacked three high, creating a 27-inches-high overflow barrier (Figure 5-6 panel B). The panels are secured with angle iron that runs perpendicular to the weir. On the downstream side, bolts protrude from the weir, varying in length but all less than 4-inches-long. Large amounts of algae were also noted in many parts of the fishway (Figure 5-6 panel C). Water velocity is calculated at 7.9 ft/s through the submerged orifices and 2.9 ft/s over the crest of the weirs in the overflow section of the fishway[5].

Features identified in this section that were not commonly found throughout the fishway include some orifices on weirs that were not flush with the wall, a pull gate on one of the weirs, non-alternating orifices, and two large pipes (that supply AWS to the fishway entrance) that are partially submerged. There were two large discontinuities in the RL wall that were 56-inches-wide by 56-inches-high by 46-inches-deep and 66-inches-wide by 67-inches-high by 50-inches-deep (Figure 5-6 panel D). Other notable features included varying orifice sizes, including one that measured 15-inches-tall by 7.5-inches-wide (compared to others throughout the fishway that are approximately 15 x 15 in.). PIT-tag readers also create a set of discontinuities, as some create lips or gaps around orifices as well as overhanging surfaces at the top of the weir (Figure 5-6 panels E and F).

The top of the overflow section contains a diffusion chamber with floor grating that has limited potential attachment points for adult lamprey. The grate on the floor of the pool measures 8 ft by 14 ft 2 in. and is 5 in. from each side wall. This grate has a 0.25 in. bar with 1 in. gaps. There is a

[5] Values presented are calculated based on dimensions measured during the assessment, and assuming a 1 ft head differential between fishway pools.

bulkhead slot in the diffusion chamber on RR that is 9-inches-wide and 4-inches-deep, creating a discontinuity in the wall surface. The baffles that create the flow regulation section each have two orifices, with alternating orifice orientation (rectangular orifices that that are oriented vertically and horizontally, where orifice orientation alternates every other baffle), and measure 36 in. by 21 in. Vertically oriented orifices are not flush with the wall and perched 14 in. from the floor. Horizontal orifices are flush with the wall and perched 20.5 in. from the floor. There are holes in each baffle (approximately 3 in. in diameter) flush with floor below the perched orifices that allow the baffle area to drain when dewatered. Concrete in this section was observed to have a large, patched area in the fourth pool of the section, and roughened areas in the second pool, creating depressions that are 2- to 3-inches-deep.

Notes:
Panel A: Bulkhead slot; Panel B: Paneled overflow diversion; Panel C: Algae on overflow weir; Panel D: Large discontinuity in fishway wall; Panels E and F: PIT tag readers.

Figure 5-6 Overflow Section and Flow Regulation of Middle Fishway

5.2.3 Count Station

The middle fishway count station is located immediately before the fishway exit. The pool downstream of the count window has orifices that are perched 14 in. off the floor, located 38.5 in. from the wall (Figure 5-7 panel A). The picketed lead used to direct fish into the counting window has 0.5 in. bar with 0.625 in. spacing (Figure 5-7 panel B). There are two uncovered drains flush with the flooring at the bottom of the picketed lead, leading to the upstream side of the trash rack. The drains are covered on the upstream side, creating a dead end approximately 2 ft upstream. The only

artificial lighting in the fishway is from the viewing area of the count station. There is an approximately 32 in. step preceding the viewing window channel. There are gaps (1 to 3 in.) between the walls, floor, and top of the window channel and the adjacent fishway structure that may allow adult Pacific Lamprey to bypass the count station. A bulkhead slot (5-inches-wide and 2.5-inches-deep) immediately preceding the middle fishway count station creates a discontinuous surface entering the count station (Figure 5-7 panels C, D, E, F).

Notes:

Panel A: Orifice for baffle that creates the pool before count window; Panel B: Picketed lead before count station; Panel C: Gap between floor and entrance to window channel; Panel D: Bulkhead slot at window entrance; Panel E: Gap between wall and channel ceiling; Panel F: Gap between window ceiling and entrance gate.

Figure 5-7 Count Station of Middle Fishway

5.2.4 Fishway Exit

The middle fishway exit is roughly 32-feet-long. The walls and floor surfaces within the exit area are smooth and do not exhibit any rough patches in the concrete. The trash racks are composed of roughly 80 in. by 80 in. panels that have a 0.25 in. bar with 0.5 in. gaps (Figure 5-8). Brush strips are installed to reduce gaps where trash rack panels meet the existing fishway structure. One panel does not have a brush strip installed on the upper half of the panel, creating a 2 in. gap. Otherwise, there is a 0 to 1 in. gap between trash rack panels and existing fishway structure.

Figure 5-8 Trash Racks in Exit Area, Gaps and Brushing Shown

5.3 Right Fishway

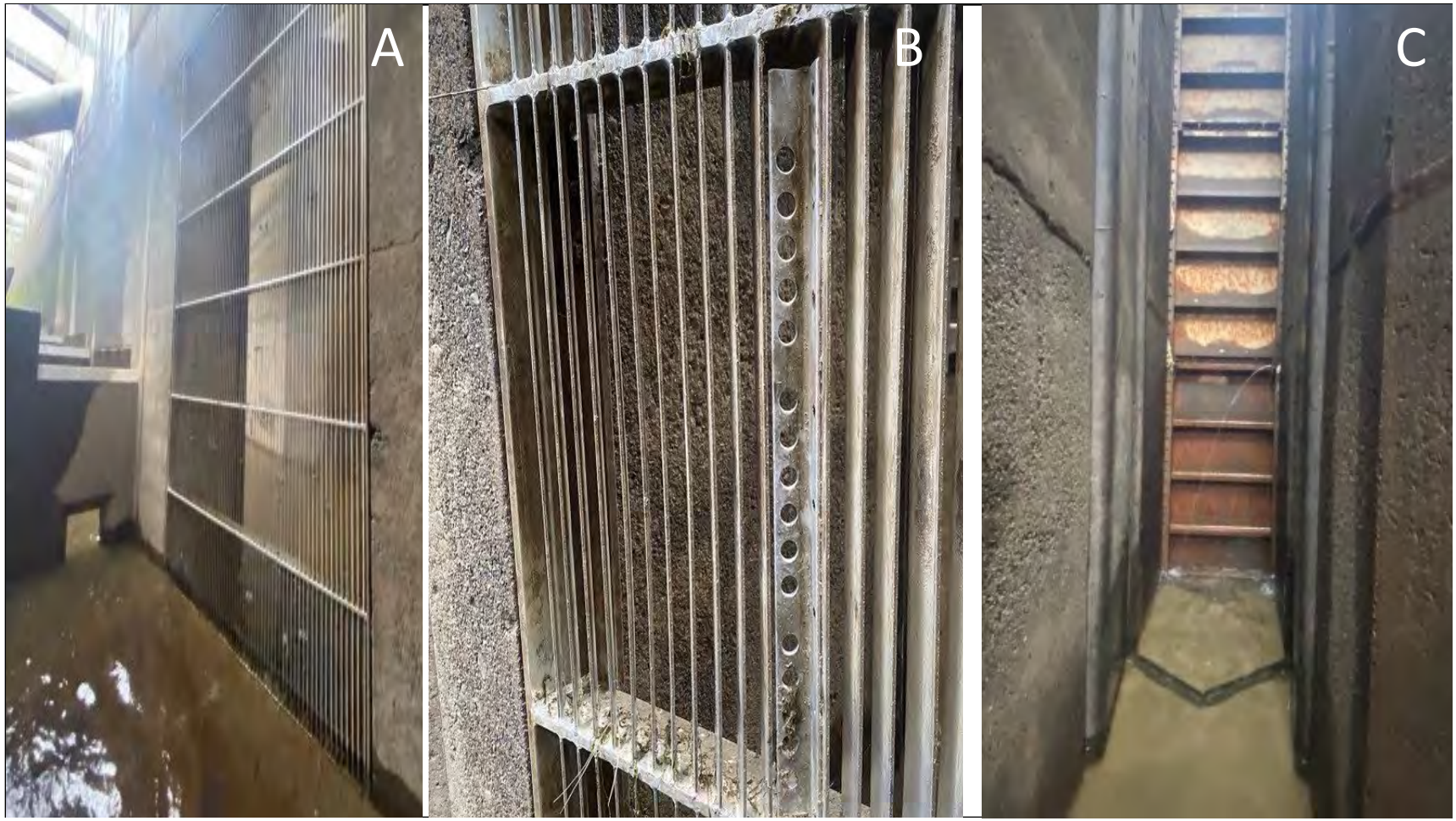
5.3.1 Entrance and Collection Galleries

The right fishway entrance has five entrances that are 3.5-feet-wide by 29-feet-high (Figure 5-9 panel C). Transportation channels connect the entrances to the collection gallery, where the transportation channels converge at the bottom of the overflow section. A head differential of 1.0 to 1.5 ft is maintained at the fishway entrances. Grating panels for AWS are located along the wall of the RL side of the collection gallery, consisting of a 0.625 in. bar with 1 in. gaps and roughly 1 in. gap between grating and concrete on perimeters with limited potential attachment points for adult lamprey (Figure 5-9 panel A). This grating is inspected annually and has been repaired in places (Figure 5-9 panel B).

All entrances to the right fishway are located adjacent to Powerhouse 2 (PH2). Two entrances are collocated near RL of PH2 (left powerhouse entrances), two entrances are collocated near RR of PH2 (right powerhouse entrances), and one entrance is located approximately 190 ft. downstream along the right bank (tailrace entrance). There are remnant wing gates near the entrance (now fixed in an open position) that create 1 to 3 in. openings that lead to dead ends that go back approximately 1 ft toward the pivot point of the gate. In recent years, the furthest entrance toward the RL side of the left powerhouse entrances has been permanently closed. Monthly flow readings have been recorded in the transportation channel between the collection gallery and the left powerhouse entrance, yielding velocities of 2.5 to 3.4 ft/s in the transport channel from April to October in 2021 (Skiles and Scheer 2021).

In the transportation channel leading to the left powerhouse entrances, there are many expansion joints that create a discontinuity in the wall and floor surface, and a drain with thick-gauged grating. This grate had roughly 1 in. bar with 2.5 in. spacing. The grate was roughly 2.5-feet-wide by 2.5-feet-long. This drain is closed throughout the year, only opened to dewater the fishway, but creates a potential dead-end route when the fishway is in operation. There is also an unused stilling well that creates discontinuity along the smooth wall on the RL of the transportation channel. All holes in the stilling well are covered.

The other two transportation channels (leading to the tailrace and right powerhouse entrances) typify many of the same features found in the left powerhouse entrance transportation channel. Expansion joints and stilling wells are found in these transportation channels. Surface roughness conditions are consistent throughout the transportation channels, where the walls and floor of the entrances are generally smooth.



Notes:
Panel A: Attraction water supply grates in the collection gallery; Panel B: Repair to attraction water supply grating: Panel C: One entrance to right fishway.

Figure 5-9 Entrance and Collection Galleries of Right Fishway

5.3.2 Overflow Section and Flow Regulation

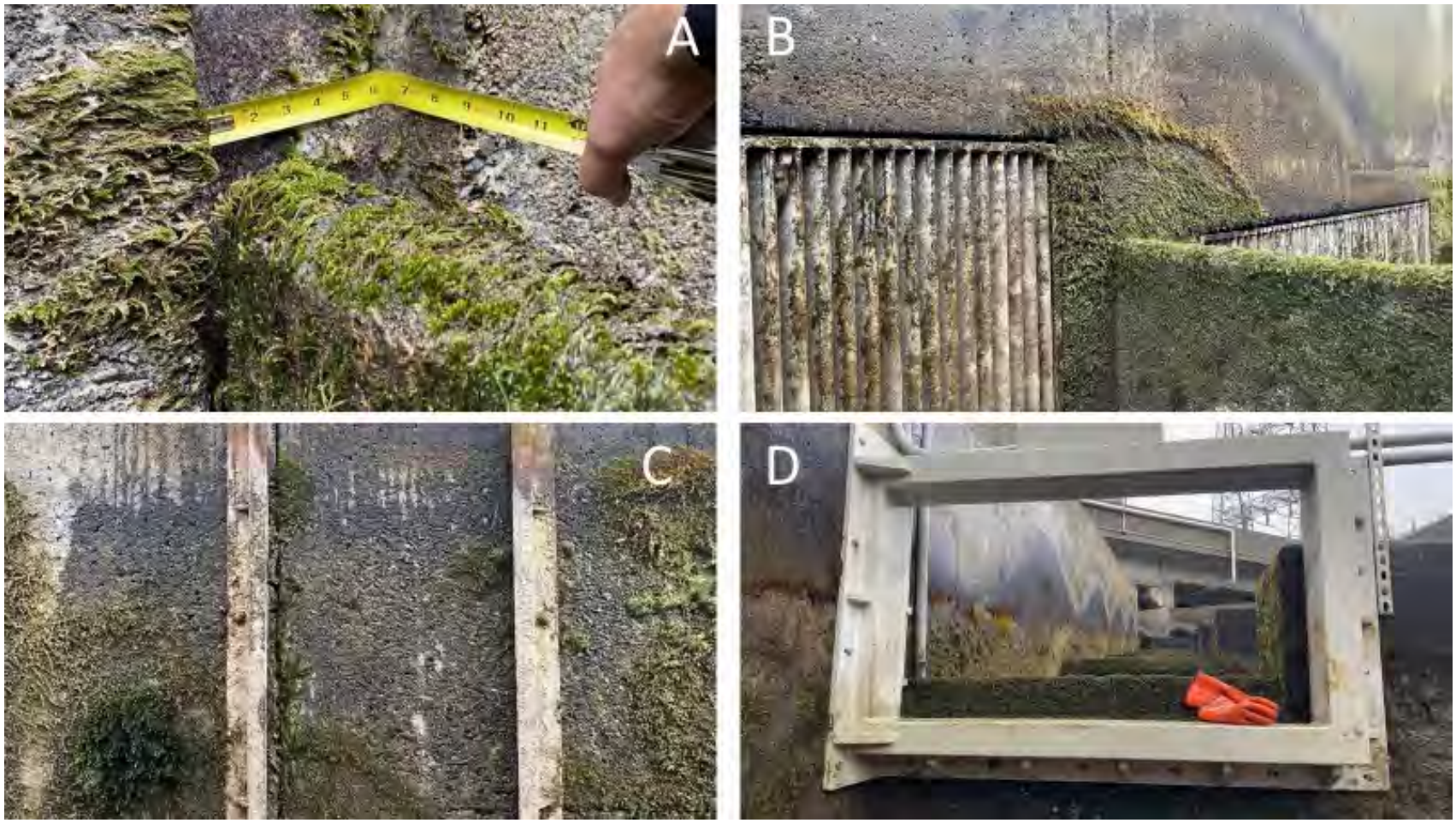
The overflow section of the right fishway includes 44 weirs and pools, followed by a flow regulation section that consists of 5 baffles and pools immediately downstream of the count station and fishway exit. Water depth over the crest of the overflow weir is maintained at 1.0 to 1.2 ft. Overflow weirs have two orifices that measure 15 by 15 in. Bulkhead slots are persistent throughout the fishway and are roughly 4-inches-deep and 6- to 9-inches-wide (Figure 5-10 panel A). There are gaps between the bulkhead slot and the weir, ranging from 1 to 2 in. The overflow section also had large amounts of algae growing on many of the surfaces. Localized roughened concrete surfaces exist along floors, walls, and weirs of the fishway. Other discontinuities were caused by expansion joints located throughout the fishway that were 2-inches-wide and 1-inch-deep. Water velocity is approximately 7.9 ft/s through the submerged orifices and 2.5 ft/s over the crest of the weirs in the overflow section of the fishway[6].

Attraction water supply grating is present from the collection gallery to weir 20, as each pool has a section of grating on the RL wall, approximately 95-inches-wide by 59-inches-long. The grating is a 0.25 in. bar with approximately 1 in. gaps with limited potential attachment points for adult lamprey (Figure 5-10 panel B). The perimeter gap around these grates is typically very small although some larger gaps around 1 in. exist in a few locations. There is angle iron present at the top of three weirs, introducing a perpendicular obstacle at the top of the weir and along the wall (Figure 5-10 panel C). There are obtuse angles within pools in the fishway walls (both RL and RR) that are created as the fishway changes direction. Angle iron with bolts (remnants from pikeminnow traps) exist at and below the water line in several pools in the overflow section and can be found on both sides of the fishway. Angle iron protrudes up to 2 in. from the wall, where bolts used to secure the angle iron vary in length, ranging from 1 - 2 in. PIT-tag readers in this section protrude out perpendicular to the weir roughly 8 in., creating a potential obstacle at Weirs 31 and 33 (Figure 5-10 panel D). The diffusion chamber is located at the top of the overflow section, where flows enter through the grating in the floor. This grate has a 0.625 in. bar with 1 in. gaps, measuring 171-inches-wide by 96-inches-long.

The baffles that create the flow regulation section each have two orifices, with alternating orifice orientation (rectangular orifices that that are oriented vertically and horizontally, where orifice orientation alternates every other baffle), and measure 36 in. by 20.5 in. Vertically oriented orifices

[6] Values presented are calculated based on dimensions measured during the assessment, and assuming a 1 ft head differential between fishway pools.

are not flush with the wall and perched 14 in. from the floor. Horizontal orifices are flush with the wall and perched 20.5 in. from the floor. There are holes in each baffle (approximately 3 in. in diameter) flush with floor below the perched orifices that allow the baffle area to drain when dewatered. Other observations include bulkhead slots (particularly on RL) and roughened concrete surfaces.



Notes:

Panel A: Bulkhead slot at the top of an overflow weir; Panel B: Attraction water supply grating seen in pools 1-20; Panel C: Remnant Pike Minnow trap hardware; Panel D: PIT tag reader overhanging on overflow section.

Figure 5-10 Overflow Section and Flow Regulation of Right Fishway

5.3.3 Count Station

The picketed lead used to direct fish to the window has a 0.5 in. bar with 0.625 in. gaps, with a gap that is 1 to 2 in. between the wall and grate on the RR side (Figure 5-11 panel A). The surface of the walls and floor in the pool prior to the entrance are rough and may prohibit attachment of adult lampreys (Figure 5-11 panel B). The fishway floor entering the count window area is elevated 24 in. from the floor and ramped in this section (Figure 5-11 panel C). All floor and wall surfaces are in good condition at the counting window. There is a gap between the wall directly over the window and the top of concrete slab structure that forms the ceiling to keep fish in the view of the window. This gap is roughly 2-inches-wide, creating an opportunity for lampreys to avoid the window. Two bulkhead slots that are 5.5-inches-wide and 2.5-inches-deep exist on the downstream side of the window. The window emits artificial light.

Notes:
Panel A: Trash rack grating and gap; Panel B: Surface roughness leading to entrance (tick marks represent 1 in.); Panel C: Entrance to counting station.

Figure 5-11 Count Station of Right Fishway

5.3.4 Fishway Exit

The fishway exit is roughly 43-feet-long. Unlike the other fishways, this fishway exit is narrow (5-feet-wide) and has a turn in it where it initially heads south before turning directly upstream to the forebay. The trash racks are composed of roughly 80 in. by 80 in. panels that have a 0.25 in. bar with 0.5 in. gaps. Brush strips are installed to reduce gaps where trash rack panels meet the existing fishway structure. Some areas do not have brush strips installed. In areas around the trash

racks that have brush strips, gaps between concrete and grating are 0 - 1.5 in. In areas without brush strips, there are gaps of approximately 1 - 4 in. (Figure 5-12 panels A and B).

There are roughened concrete surfaces in the exit area. There are six lights on the RL wall above the water line that run continuously (Figure 5-12 panel C). The lights are sufficient to illuminate a large portion of the water column from the viewing window to the exit. There are PIT arrays in the exit that create a trapezoidal shape that protrudes perpendicularly off both the RR and RL side walls.

Notes:
Panels A and B: Trash racks and associated gaps (tick marks in panel A represent 1 in.); Panel C: One of six lights used in fishway exit.

Figure 5-12 Right Fishway Exit

6.0 CONCLUSION

Within adult fishways, there are specific features to consider for adult Pacific Lamprey. Lamprey use anguilliform locomotion, which is typically not well suited for high velocity water or high-water turbulence (Moser and Mesa 2009, Reid and Goodman 2016). Due to this mode of locomotion, lampreys use burst-and-attach swimming to pass areas exceeding their optimal swimming speed and can also vertically climb to overcome certain obstacles (Reinhardt et al. 2008; Kemp et al. 2009). Utilizing guidelines developed by the LTWG (2022), this study identified fishway features known to potentially affect adult lamprey passage.

During the assessment, features identified include perched orifices, overhanging surfaces in passage areas (i.e., protruding PIT tag arrays), and discontinuous surfaces in high velocity areas in all three fishways. Other areas that were more localized and fishway-specific included the presence of continuously operated artificial light, dead-end routes, and 90 degree turns in the fishway. Passage routes that potentially allow lamprey to circumvent the count stations were also identified. Conversely, some areas were found to be consistent with recommendations from the LTWG (2022), such as orifices flush with the fishway floor and overflow weirs with water velocity well within the swimming capabilities of adult Pacific Lamprey.

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Appendix A Consultation Record

Chelan PUD submitted the draft Adult Pacific Lamprey Fishway Infrastructure Assessment Study Report to the Fish and Aquatic Technical Working Group (TWG) (see Table A- 1) via email on May 18, 2023 for a 10-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table A- 2 below.

Table A- 1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
American Rivers	Bridget Moran
Audubon Society	Mark Johnston
Blue Leaf	Dave Robichaud
Blue Leaf	Corey Wright
Bureau of Indian Affairs (BIA)	Keith Hatch
BIA	Stephen Lewis
Cascade Fisheries	Jason Lundgren
Chelan County	Julie Sanderson
Chelan PUD	Alene Underwood
Chelan PUD	Ben Truscott
Chelan PUD	Brian Odell
Chelan PUD	Catherine Willard
Chelan PUD	Janel Ulrich
Chelan PUD	Kate Taylor
Chelan PUD	Lance Keller
Chelan PUD	Marcie Clement
Chelan PUD	Scott Hopkins
Chelan PUD	William Towey
City of Rock Island	Brock Laughlin
Columbia River Inter-Tribal Fish Commission (CRITFC)	Blaine Parker
CRITFC	Carl Merkle
CRITFC	Diane Barton
CRITFC	Julie Carter
CRITFC	Lauri Porter
CRITFC	Tom Skiles
Colville Tribe	Bret Nine
Colville Tribe	Casey Baldwin
Colville Tribe	Douglas Marconi
Colville Tribe	Jason McLellan

ORGANIZATION	NAME
Colville Tribe	Kirk Truscott
Confederated Tribes of the Umatilla Indian Reservation	Audie Huber
Confederated Tribes of the Umatilla Indian Reservation	Brent Hall
Confederated Tribes of the Umatilla Indian Reservation	Aaron Jackson
Confluence Environmental Company	Eric Doyle
DNR	Cindy Preston
DNR	James Huinker
EAS	Cole Lindsey
Ecology	Breean Zimmerman
Ecology	Mark Peterschmidt
Ecology	Tyson Oreiro
Four Peaks	Joe Miller
Four Peaks	Joshua Murauskas
Four Peaks	Leah Nagel
Four Peaks	Pradeep Mugunthan
Golder	Paul Grutter
Individual	Steve Hays
Kearns & West	Angela Hessenius
Kearns & West	Jim Downing
Kearns & West	Katy Kennedy
Kearns & West	Kelsey Rugani
Kearns & West	Mary Beth Day
Kleinschmidt	Audrey Thompson
Kleinschmidt	Jeff Deason
Kleinschmidt	Kai Steimle
Kleinschmidt	MaryLouise Keefe
Kleinschmidt	Nathalie Denis
NOAA	Justin Yeager
NOAA	Scott Carlton
NPCC	Sara Mounts
NPCC	Stacy Horton
UCSRB	Tracy Bowerman
USBR	Gina Hoff
USBR	Shannon Archuleta
USFWS	Jason Romine

ORGANIZATION	NAME
USFWS	Jerrmaine Treadwell
USFWS	Judy Neibauer
USFWS	Kenneth Muir
USFWS	R.D. Nelle
USFWS	Sonja Kokos
USFWS	Tara Callaway
USFWS	William Gale
WA-Parks	Andrew Fielding
WA-Parks	Chelsea Harris
WDFW	Andrew Murdoch
WDFW	Benjamin Blank
WDFW	Chad Jackson
WDFW	Dave Burgess
WDFW	Laura Heironimus
WDFW	Patrick Verhey
Yakama Nation	Brandon Rogers
Yakama Nation	David Blodgett
Yakama Nation	Donella Miller
Yakama Nation	Elaine Harvey
Yakama Nation	Keely Murdoch
Yakama Nation	Ralph Lampman
Yakama Nation	Tom Iverson

Table A- 2 Comments Received

Comment #	Comment Date	Name/Entity	Document or Report Name	Stakeholder Comment	Chelan PUD Response
A-1-1	5/24/23	Gina Hoff, US Bureau of Reclamation	Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report	No comment at this time. Thank you, Gina Hoff	Thank you for reviewing the study plan.
A-2-1	5/26/23	Sara Mounts, NPCC	Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report	We have no comment.	Thank you for reviewing the study plan.
A-3-1	6/02/23	Shelby Fowler, USFWS	Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report	I'd like to see more discussion on the floor diffuser grating. It's not clear to me without additional drawings/photos if there are attachment areas through the diffusers.	Most diffuser grating had limited surface areas that appeared sufficient for attachment points for adult lampreys. The study report has been updated to provide clarity (see lines 105; 166; 216; 225 – 226; 232-233; 274; 325-326; and 368-369).
A-4-1	6/22/23	James Huinker, DNR	Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report	I did not have any comments on the Relicensing Adult Pacific Lamprey Infrastructure Assessment Report and apologize for my delayed response.	Thank you for reviewing the study plan.

RIRelicensing

From: RIRelicensing
Sent: Wednesday, May 24, 2023 8:35 AM
To: 'aaronjackson@ctuir.org'; 'AHessenius@kearnswest.com'; Alene Underwood; 'andrew.fielding@parks.wa.gov'; 'Andrew.Murdoch@dfw.wa.gov'; 'AudieHuber@ctuir.org'; 'Audrey.Thompson@kleinschmidtgroup.com'; 'bard@critfc.org'; Ben Truscott; 'Benjamin.Blank@dfw.wa.gov'; 'bladescodeservices@yahoo.com'; 'blod@yakamafish-nsn.gov'; 'bmoran@americanrivers.org'; 'brenthall@ctuir.org'; 'bret.nine@colvilletribes.com'; Brian Odell; 'bzim461@ecy.wa.gov'; 'carj@critfc.org'; 'CarlMerkle@ctuir.org'; 'Casey.Baldwin@colvilletribes.com'; Catherine Willard; 'chad.jackson@dfw.wa.gov'; 'Chelsea.Harris@parks.wa.gov'; 'cindy.preston@dnr.wa.gov'; 'cwright@lgl.com'; 'dave.burgess@dfw.wa.gov'; 'dmiller@critfc.org'; 'drobichaud@lgl.com'; 'DStuart@nhcweb.com'; 'eric.doyle@confenv.com'; 'ghoff@usbr.gov'; 'hare@yakamafish-nsn.gov'; 'Harold.Peterson@bia.gov'; 'ivet@yakamafish-nsn.gov'; 'James.Huinker@dnr.wa.gov'; Janel Ulrich; 'jason.mclellan@colvilletribes.com'; 'jason@ccfeg.org'; 'jason_romine@fws.gov'; 'jdowning@kearnswest.com'; 'jeff.deason@kleinschmidtgroup.com'; 'jerrmaine_treadwell@fws.gov'; 'jmiller@fourpeaksenv.com'; 'jmurauskas@fourpeaksenv.com'; 'judy_neibauer@fws.gov'; 'julie.sanderson@co.chelan.wa.us'; 'justin.yeager@noaa.gov'; 'kai.steimle@kleinschmidtgroup.com'; 'kalman.bugica@ecy.wa.gov'; Kate Taylor; 'keith.hatch@indianaffairs.gov'; 'kenneth_muir@fws.gov'; 'kirk.truscott@colvilletribes.com'; 'kkennedy@kearnswest.com'; 'krugani@kearnswest.com'; 'lamr@yakamafish-nsn.gov'; Lance Keller; Laura Clark; 'laura.heironimus@dfw.wa.gov'; 'lnagel@fourpeaksenv.com'; 'mape461@ecy.wa.gov'; 'marylouise.keefe@kleinschmidtgroup.com'; 'matt.paulsen@komanholdings.com'; 'mbday@kearnswest.com'; 'murk@yakamafish-nsn.gov'; 'Nathalie.Denis@Kleinschmidtgroup.com'; 'parb@critfc.org'; 'Patrick.Verhey@dfw.wa.gov'; 'Paul_Grutter@golder.com'; Peter Vanney; 'pmugunthan@fourpeaksenv.com'; 'porl@critfc.org'; 'RD_Nelle@fws.gov'; 'renata.rollins.env@colvilletribes.com'; 'rogb@yakamafish-nsn.gov'; 'sarchuleta@usbr.gov'; 'scott.carlon@noaa.gov'; Scott Hopkins; 'sghays51@msn.com'; 'shorton@nwcouncil.org'; 'skit@critfc.org'; 'SMounts@NWCouncil.org'; 'Sonja_Kokos@fws.gov'; 'stephen.lewis@bia.gov'; 'tara_callaway@fws.gov'; 'tore461@ecy.wa.gov'; 'toxostoma495@gmail.com'; 'tracy.bowerman@ucsrb.org'; Bill Towey; 'william_gale@fws.gov'
Subject: RE: RI Relicensing Adult Pacific Lamprey Infrastructure Assessment Report - Comment Opportunity

Good morning,

This is a reminder that comments on the Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report are due by **end of day next Friday, June 2.**
Click the link to access the document and submit your comments. Again, if you have no comments after your review, we appreciate the submission through the Smart Comment platform of “no comment” as that is helpful for the consultation record.

Thank you,

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Thursday, May 18, 2023 1:24 PM
To: 'aaronjackson@ctuir.org' <aaronjackson@ctuir.org>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; Alene Underwood <Alene.Underwood@chelanpud.org>;

'andrew.fielding@parks.wa.gov' <andrew.fielding@parks.wa.gov>; 'Andrew.Murdoch@dfw.wa.gov' <Andrew.Murdoch@dfw.wa.gov>; 'AudieHuber@ctuir.org' <AudieHuber@ctuir.org>; 'Audrey.Thompson@kleinschmidtgroup.com' <Audrey.Thompson@kleinschmidtgroup.com>; 'bard@critfc.org' <bard@critfc.org>; Ben Truscott <Ben.Truscott@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'blod@yakamafish-nsn.gov' <blod@yakamafish-nsn.gov>; 'bmoran@americanrivers.org' <bmoran@americanrivers.org>; 'brenthall@ctuir.org' <brenthall@ctuir.org>; 'bret.nine@colvilletribes.com' <bret.nine@colvilletribes.com>; Brian Odell <brian.odell@chelanpud.org>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'carj@critfc.org' <carj@critfc.org>; 'CarlMerkle@ctuir.org' <CarlMerkle@ctuir.org>; 'Casey.Baldwin@colvilletribes.com' <Casey.Baldwin@colvilletribes.com>; Catherine Willard <Catherine.Willard@chelanpud.org>; 'chad.jackson@dfw.wa.gov' <chad.jackson@dfw.wa.gov>; 'Chelsea.Harris@parks.wa.gov' <Chelsea.Harris@parks.wa.gov>; 'cindy.preston@dnr.wa.gov' <cindy.preston@dnr.wa.gov>; 'cwright@lgl.com' <cwright@lgl.com>; 'dave.burgess@dfw.wa.gov' <dave.burgess@dfw.wa.gov>; 'dmiller@critfc.org' <dmiller@critfc.org>; 'drobichaud@lgl.com' <drobichaud@lgl.com>; 'DStuart@nhcweb.com' <DStuart@nhcweb.com>; 'eric.doyle@confenv.com' <eric.doyle@confenv.com>; 'ghoff@usbr.gov' <ghoff@usbr.gov>; 'hare@yakamafish-nsn.gov' <hare@yakamafish-nsn.gov>; 'Harold.Peterson@bia.gov' <Harold.Peterson@bia.gov>; 'ivet@yakamafish-nsn.gov' <ivet@yakamafish-nsn.gov>; 'James.Huinker@dnr.wa.gov' <James.Huinker@dnr.wa.gov>; Janel Ulrich <janel.ulrich@chelanpud.org>; 'jason.mclellan@colvilletribes.com' <jason.mclellan@colvilletribes.com>; 'jason@ccfeg.org' <jason@ccfeg.org>; 'jason_romine@fws.gov' <jason_romine@fws.gov>; 'jdowning@kearnswest.com' <jdowning@kearnswest.com>; 'jeff.deason@kleinschmidtgroup.com' <jeff.deason@kleinschmidtgroup.com>; 'jerrmaine_treadwell@fws.gov' <jerrmaine_treadwell@fws.gov>; 'jmiller@fourpeaksenv.com' <jmiller@fourpeaksenv.com>; 'jmurauskas@fourpeaksenv.com' <jmurauskas@fourpeaksenv.com>; 'judy_neibauer@fws.gov' <judy_neibauer@fws.gov>; 'julie.sanderson@co.chelan.wa.us' <julie.sanderson@co.chelan.wa.us>; 'justin.yeager@noaa.gov' <justin.yeager@noaa.gov>; 'kai.steimle@kleinschmidtgroup.com' <kai.steimle@kleinschmidtgroup.com>; 'kalman.bugica@ecy.wa.gov' <kalman.bugica@ecy.wa.gov>; Kate Taylor <Kate.Taylor@chelanpud.org>; 'keith.hatch@indianaffairs.gov' <keith.hatch@indianaffairs.gov>; 'kenneth_muir@fws.gov' <kenneth_muir@fws.gov>; 'kirk.truscott@colvilletribes.com' <kirk.truscott@colvilletribes.com>; 'kkennedy@kearnswest.com' <kkennedy@kearnswest.com>; 'krugani@kearnswest.com' <krugani@kearnswest.com>; 'lamr@yakamafish-nsn.gov' <lamr@yakamafish-nsn.gov>; Lance Keller <Lance.Keller@chelanpud.org>; Laura Clark <Laura.Clark@chelanpud.org>; 'laura.heironimus@dfw.wa.gov' <laura.heironimus@dfw.wa.gov>; 'lnagel@fourpeaksenv.com' <lnagel@fourpeaksenv.com>; 'mape461@ecy.wa.gov' <mape461@ecy.wa.gov>; 'marylouise.keefe@kleinschmidtgroup.com' <marylouise.keefe@kleinschmidtgroup.com>; 'matt.paulsen@komanholdings.com' <matt.paulsen@komanholdings.com>; 'mbday@kearnswest.com' <mbday@kearnswest.com>; 'murk@yakamafish-nsn.gov' <murk@yakamafish-nsn.gov>; 'Nathalie.Denis@Kleinschmidtgroup.com' <Nathalie.Denis@Kleinschmidtgroup.com>; 'parb@critfc.org' <parb@critfc.org>; 'Patrick.Verhey@dfw.wa.gov' <Patrick.Verhey@dfw.wa.gov>; 'Paul_Grutter@golder.com' <Paul_Grutter@golder.com>; Peter Vanney <Peter.Vanney@chelanpud.org>; 'pmugunthan@fourpeaksenv.com' <pmugunthan@fourpeaksenv.com>; 'porl@critfc.org' <porl@critfc.org>; 'RD_Nelle@fws.gov' <RD_Nelle@fws.gov>; 'renata.rollins.env@colvilletribes.com' <renata.rollins.env@colvilletribes.com>; RIRelicensing <RIRelicensing@chelanpud.org>; 'rogb@yakamafish-nsn.gov' <rogb@yakamafish-nsn.gov>; 'sarchuleta@usbr.gov' <sarchuleta@usbr.gov>; 'scott.carlon@noaa.gov' <scott.carlon@noaa.gov>; Scott Hopkins <Scott.Hopkins@chelanpud.org>; 'sghays51@msn.com' <sghays51@msn.com>; 'shorton@nwcouncil.org' <shorton@nwcouncil.org>; 'skit@critfc.org' <skit@critfc.org>; 'SMounts@NWCouncil.org' <SMounts@NWCouncil.org>; 'Sonja_Kokos@fws.gov' <Sonja_Kokos@fws.gov>; 'stephen.lewis@bia.gov' <stephen.lewis@bia.gov>; 'tara_callaway@fws.gov' <tara_callaway@fws.gov>; 'tore461@ecy.wa.gov' <tore461@ecy.wa.gov>; 'toxostoma495@gmail.com' <toxostoma495@gmail.com>; 'tracy.bowerman@ucsrb.org' <tracy.bowerman@ucsrb.org>; Bill Towey <bill.towey@chelanpud.org>; 'william_gale@fws.gov' <william_gale@fws.gov>
Subject: RI Relicensing Adult Pacific Lamprey Infrastructure Assessment Report - Comment Opportunity

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Thank you for your participation.

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report

Chelan County PUD invites stakeholders to provide comments on our draft study report. Please review the document (click "Review Document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

Your Comment

Comments can be submitted through an attachment or provided directly in the space below.

Review Document

Insert comments on Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report

Upload A File

"Uploading a file is optional"

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment please contact the person listed at the bottom of this page.

Continue »

From: Sara Mounts
To: RIRelicensing
Subject: [External] RE: RI Relicensing Adult Pacific Lamprey Infrastructure Assessment Report - Comment Opportunity
Date: Thursday, May 18, 2023 2:12:22 PM
Attachments: image001.png

We have no comment.

Thank you,

Sara Mounts
NW Power and Conservation Council
WA State Office: (360) 816-1172 | www.nwcouncil.org

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Thursday, May 18, 2023 1:24 PM
To: 'aaronjackson@ctuir.org' <aaronjackson@ctuir.org>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; Alene Underwood <Alene.Underwood@chelanpud.org>; 'andrew.fielding@parks.wa.gov' <andrew.fielding@parks.wa.gov>; 'Andrew.Murdoch@dfw.wa.gov' <Andrew.Murdoch@dfw.wa.gov>; 'AudieHuber@ctuir.org' <AudieHuber@ctuir.org>; 'Audrey.Thompson@kleinschmidtgroup.com' <Audrey.Thompson@kleinschmidtgroup.com>; 'bard@critfc.org' <bard@critfc.org>; Ben Truscott <Ben.Truscott@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'blod@yakamafish-nsn.gov' <blod@yakamafish-nsn.gov>; 'bmoran@americanrivers.org' <bmoran@americanrivers.org>; 'brenthall@ctuir.org' <brenthall@ctuir.org>; 'bret.nine@colvilletribes.com' <bret.nine@colvilletribes.com>; Brian Odell <brian.odell@chelanpud.org>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'carj@critfc.org' <carj@critfc.org>; 'CarlMerkle@ctuir.org' <CarlMerkle@ctuir.org>; 'Casey.Baldwin@colvilletribes.com' <Casey.Baldwin@colvilletribes.com>; Catherine Willard <Catherine.Willard@chelanpud.org>; 'chad.jackson@dfw.wa.gov' <chad.jackson@dfw.wa.gov>; 'Chelsea.Harris@parks.wa.gov' <Chelsea.Harris@parks.wa.gov>; 'cindy.preston@dnr.wa.gov' <cindy.preston@dnr.wa.gov>; 'cwright@lgl.com' <cwright@lgl.com>; 'dave.burgess@dfw.wa.gov' <dave.burgess@dfw.wa.gov>; 'dmiller@critfc.org' <dmiller@critfc.org>; 'drobichaud@lgl.com' <drobichaud@lgl.com>; 'DStuart@nhcweb.com' <DStuart@nhcweb.com>; 'eric.doyle@confenv.com' <eric.doyle@confenv.com>; 'ghoff@usbr.gov' <ghoff@usbr.gov>; 'hare@yakamafish-nsn.gov' <hare@yakamafish-nsn.gov>; 'Harold.Peterson@bia.gov' <Harold.Peterson@bia.gov>; 'ivet@yakamafish-nsn.gov' <ivet@yakamafish-nsn.gov>; 'James.Huinker@dnr.wa.gov' <James.Huinker@dnr.wa.gov>; Janel Ulrich <janel.ulrich@chelanpud.org>; 'jason.mclellan@colvilletribes.com' <jason.mclellan@colvilletribes.com>; 'jason@ccfeg.org' <jason@ccfeg.org>; 'jason_romine@fws.gov' <jason_romine@fws.gov>; 'jdowning@kearnswest.com' <jdowning@kearnswest.com>; 'jeff.deason@kleinschmidtgroup.com' <jeff.deason@kleinschmidtgroup.com>; 'jerrmaine_treadwell@fws.gov'

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Subject: [External Sender] RI Relicensing Adult Pacific Lamprey Infrastructure Assessment Report - Comment Opportunity

Good afternoon,

Here is the link to comment on the Rock Island Relicensing Adult Pacific Lamprey Infrastructure Assessment Report. Click the link to access the document and submit your comments.
If you have no comments after your review, we appreciate the submission through the Smart Comment platform of “no comment” as that is helpful for the consultation record.

Comments are to be submitted by EOD Friday, June 2, 2023.

Thank you for your participation.

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

From: Hoff, Gina M
To: RIRelicensing
Cc: Hauser, Teresa A
Subject: Re: [EXTERNAL] RI Relicensing Adult Pacific Lamprey Infrastructure Assessment Report - Comment Opportunity
Date: Tuesday, May 23, 2023 5:35:23 PM
Attachments: image001.png

ATTENTION: This email is from GHoff@usbr.gov. Are you expecting this?
If not, please forward it to our Phishing Hole. Thank You!

Good afternoon,

Thank you, for the opportunity to review and provide comments on the subject matter document. I have taken the time to review the Adult Pacific Lamprey Infrastructure Assessment Report, and I have no comments at this time, on the draft report. Thank you and enjoy the evening. G

Gina M Hoff - Water Quality Specialist/AIS Coordinator
Bureau of Reclamation - Columbia-Cascades Area Office
1917 Marsh Rd.
Yakima, WA 98901-2058
509-573-8044 - Office
509-978-9355 - Cell

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Thursday, May 18, 2023 1:24 PM
To: 'aaronjackson@ctuir.org' <aaronjackson@ctuir.org>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; alene.underwood@chelanpud.org <alene.underwood@chelanpud.org>; 'andrew.fielding@parks.wa.gov' <andrew.fielding@parks.wa.gov>; 'Andrew.Murdoch@dfw.wa.gov' <Andrew.Murdoch@dfw.wa.gov>; 'AudieHuber@ctuir.org' <AudieHuber@ctuir.org>; 'Audrey.Thompson@kleinschmidtgroup.com' <Audrey.Thompson@kleinschmidtgroup.com>; Dianne Barton <bard@critfc.org>; Ben Truscott <Ben.Truscott@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'blod@yakamafish-nsn.gov' <blod@yakamafish-nsn.gov>; 'bmoran@americanrivers.org' <bmoran@americanrivers.org>; 'brenthall@ctuir.org' <brenthall@ctuir.org>; Bret Nine <bret.nine@colvilletribes.com>; Brian Odell <brian.odell@chelanpud.org>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'carj@critfc.org' <carj@critfc.org>; 'CarlMerkle@ctuir.org' <CarlMerkle@ctuir.org>; 'Casey.Baldwin@colvilletribes.com' <Casey.Baldwin@colvilletribes.com>; Catherine Willard <Catherine.Willard@chelanpud.org>; Jackson, Chad S (DFW) <chad.jackson@dfw.wa.gov>; 'Chelsea.Harris@parks.wa.gov' <Chelsea.Harris@parks.wa.gov>; 'cindy.preston@dnr.wa.gov' <cindy.preston@dnr.wa.gov>; 'cwright@lgl.com' <cwright@lgl.com>; 'dave.burgess@dfw.wa.gov' <dave.burgess@dfw.wa.gov>; 'dmiller@critfc.org' <dmiller@critfc.org>; 'drobichaud@lgl.com' <drobichaud@lgl.com>; 'DStuart@nhcweb.com' <DStuart@nhcweb.com>; 'eric.doyle@confenv.com' <eric.doyle@confenv.com>; Hoff, Gina M <GHoff@usbr.gov>; 'hare@yakamafish-nsn.gov' <hare@yakamafish-nsn.gov>; Peterson, Harold S <Harold.Peterson@bia.gov>; 'ivet@yakamafish-nsn.gov' <ivet@yakamafish-nsn.gov>; 'James.Huinker@dnr.wa.gov' <James.Huinker@dnr.wa.gov>; Janel Ulrich

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Laura Clark
Licensing & Compliance Specialist
Chelan PUD

G.4 WHITE STURGEON POPULATION INDEXING STUDY PLAN AND STUDY REPORT

WHITE STURGEON POPULATION INDEXING STUDY PLAN

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943

Source: Wright, CD (2021)

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY

327 N. WENATCHEE AVENUE

WENATCHEE, WA 98801

JUNE 2022

WHITE STURGEON Population Indexing STUDY PLAN

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

BLUE LEAF ENVIRONMENTAL
A MEMBER OF THE LGL GROUP OF COMPANIES
LGL

JUNE 2022

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1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Project). The Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Project, which will utilize the Integrated Licensing Process (ILP). Chelan PUD intends to implement this study plan in 2022 and include its results in the Pre-Application Document (PAD). Decision criteria for early study plan development and implementation have been designed to match those described in FERC's guidance for applying study criteria in the ILP[1] .

[1] FERC, *A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria* (March 2012). https://www.ferc.gov/sites/default/files/2020-07/guide-study-criteria.pdf

2.0 STUDY GOALS AND OBJECTIVES

The primary goal of this study is to determine the status and characterize the population of White Sturgeon (*Acipenser transmontanus*) in the Rock Island Reservoir. This characterization of the population is expected to provide information on population size and ability to achieve natural recruitment allowing for a self-sustaining population. The specific objectives of this initial population assessment are:

- Capture and mark (PIT tag) as many White Sturgeon as reasonably possible in an initial setline fishing session.
- Obtain biometrics including length, girth, weight, origin (through scute removal patterns), as well as age, sex, and stage of maturation from captured wild adults.
- Follow-up initial setline fishing session(s) with recapture of as many previously marked White Sturgeon as reasonably possible to allow statistical determination of population size.

3.0 RELEVANT RESOURCE MANAGEMENT GOALS OR PUBLIC INTEREST CONSIDERATIONS

White Sturgeon is not listed as a threatened or endangered species under the U.S. Endangered Species Act within the Columbia River, Washington. The White Sturgeon is a listed as a Species of Greatest Conservation Need (SGCN) by the Washington Department of Fish and Wildlife (WDFW) under the State Wildlife Action Plan (SWAP). SGCN-classified species include both those with and without legal protection status under the Federal or State Endangered Species programs, as well as game species with low populations. The White Sturgeon is also a Priority Species under the WDFW Priority Species and Habitat Program (WDFW 2021).

4.0 GEOGRAPHIC SCOPE

The Project is located on the Columbia River near the cities of Wenatchee and East Wenatchee in Chelan County and Douglas County, Washington, from river mile (RM) 453.4 to RM 473.7 (NMFS 2002). The study area encompasses the Rock Island Reservoir, excluding the boat restriction zones in the forebay of Rock Island Dam and the tailrace of Rocky Reach Dam.

The study area is depicted in Figure 4-1.

Figure 4-1 White Sturgeon Population Indexing Study Area

5.0 EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

There is little known about the status of the White Sturgeon population in the Rock Island Reservoir. There are only two known historic population assessments performed in the Rock Island Reservoir. A single WDFW stock assessment was performed during 1998 when 95 setlines were fished and only four sturgeon were captured, ranging from 144-192 cm FL (DeVore et al. 2000). With only one sampling period and few recaptures a population size estimate was not possible.

The wild population of White Sturgeon in the Rocky Reach Reservoir immediately upstream of the Project was assessed during the Rocky Reach pre-relicensing studies (2001-2002), and additionally during the 2014 acoustic tagging efforts. Result from these studies estimated the wild population to be 75 adults (95% CI: 38-151; Wright et al. 2015). The population of wild White Sturgeon immediately downstream of the Rock Island Project in the Wanapum Reservoir was estimated during pre-relicensing studies (2001 and 2002) at 551 individuals (95% CI: 314-1460; Golder 2003). Both the Wanapum and Rocky Reach reservoirs have had minimal detected natural recruitment. Both reservoirs have larger surface areas than the Rock Island reservoir, and therefore presumably more available habitat. Consequently, the abundance of wild White Sturgeon in the Rock Island reservoir is likely to be similar or less than these adjacent populations.

In addition to the wild White Sturgeon population, there are two sources of hatchery origin White Sturgeon in the Rock Island reservoir.

1) The Columbia River Inter-Tribal Fish Commission (CRITFC) released 20,600 hatchery origin juvenile White Sturgeon in the Rock Island Reservoir in 2003. Many of these sturgeon have emigrated to downstream reservoirs. During 2017 and 2018, WDFW opened a retention fishery in attempt to remove these CRITFC-released hatchery origin sturgeon, with minimal genetic diversity, from the Wanapum and Priest Rapids reservoirs. Prior to this removal effort, CRITFC-released sturgeon comprised up to 90% of the catch during adult White Sturgeon indexing efforts in the Wanapum reservoir (Golder 2011). It is likely that many of the brood-year (BY) 2002 CRITFC-released hatchery origin sturgeon remain in the Rock Island reservoir.
2) The second source of hatchery origin White Sturgeon is downstream emigrants from hatchery supplementation efforts in the Rocky Reach (Chelan PUD) and Wells (Douglas PUD) reservoirs, which were released annually beginning in 2011. As of 2021, the total number of hatchery origin White Sturgeon released into the Rocky Reach reservoir was 35,460. Acoustic tracking efforts estimate that as much as 9.5% of the Rocky Reach population has emigrated into the Rock Island reservoir over time (Robichaud et al. 2021).

6.0 PROJECT NEXUS AND RATIONALE FOR STUDY

White Sturgeon are a large, long-lived native fish in the Columbia River. Historic population levels of White Sturgeon have declined within the past 150 years due to many anthropogenic factors including overharvest, pollution, dam construction, and habitat alteration (Hilebrand et al. 2016). Historically, and prior to the development of the hydropower system, White Sturgeon were likely to move relatively long distances within the Columbia River between spawning, feeding, and overwintering areas as demonstrated by genetic similarities over large areas, and little to no genetic divergence from adjacent isolated populations (Schreier et al. 2013). Although some upstream use of fish ladders at dams is documented, it is relatively rare. Ladders are designed for salmonids and do not effectively allow for upstream movements of sturgeon, resulting in net downstream movements of populations over time and effectively isolating populations between impoundments (Parsley et al. 2007). Project construction and operation have fragmented the White Sturgeon population in the Rock Island reservoir. This study will provide information to assess how fragmentation may have affected White Sturgeon population demographics (i.e., age and size structure, genetic diversity, and abundance) and natural recruitment.

7.0 STUDY METHODOLOGY

In general, setline fishing and mark-recapture methods will be used to determine population demographics such as abundance, size, age structure, and origin.

7.1 Setlines

The capture of White Sturgeon will be conducted using setlines comprised of a 183 m (600 ft) mainline, anchored at both ends, with 40 circle hooks spread evenly; a method adapted from Elliott and Beamesderfer (1990). Similar techniques are used by WDFW as well as Oregon Department of Fish and Wildlife for annual stock assessments and have also been used in the mid and upper Columbia River for sturgeon population monitoring programs. Eight or more setlines will be deployed each day and retrieved the following day (approximately 18-hour soak time). A mixture of circle hook sizes (12/0, 14/0, and 16/0) will be used. Thirteen of each hook size with a randomly selected 14th hook size will deployed on each setline. All circle hooks will be barbed. Hooks will be baited with pickled squid from the Gilmore Fish Smokehouse (Dallesport, WA). The date, time, coordinates, and the minimum and maximum depth of each setline will be recorded.

At least two setline fishing sessions will be conducted, each being comprised of approximately 72 sample locations. Each session will be comprised of a minimum of five days of fishing at randomly determined sites throughout the Rock Island reservoir. One of the goals of the randomized fishing efforts will be to collect an unbiased sample from which population demographics can be determined. The goal of the first session (June) will be to mark as many wild White Sturgeon as possible. An additional session may be conducted to supplement the random sampling with 3-5 days of targeted fishing in areas of known or perceived abundance. If the number of marked sturgeon is still below target, additional randomized or targeted fishing days could be conducted. The goal of the second session (late August/early September) will be to randomly sample from the population to further contribute to the demographic analyses, and to recapture fish marked during the previous sessions.

7.2 Fish Handling

White Sturgeon captured will be scanned for a PIT tag (BioMark Model HPR Lite Reader) and measured for fork length (cm), girth (cm), and weight (kg). Girth will be measured directly behind the pectoral fins. Each sturgeon captured will be examined for removed scutes (indicating hatchery origin), and the location and pattern of removed scutes will be documented. All sturgeon captured without a PIT tag will be implanted with a new tag (BioMark Model HPT12) on the left dorsal side, just posterior of the head. Wild fish without hatchery scute mark patterns will have the second left lateral scute removed to mark it as having a PIT tag. No additional scutes will be

removed from fish with previous scute marks. A DNA sample will be taken from all sturgeon captured (small fin clip from a pelvic fin) and preserved on Whatman sheets for DNA processing. DNA samples will be processed and archived by the CRITFC Hagerman Genetics Laboratory. All injuries or abnormalities (e.g., stunted, or missing fins) will be documented. All fish captured will be released near their capture location immediately after measurements (and other processing, see below) are completed. The hook size that each sturgeon was captured on will also be noted.

White Sturgeon large enough that they cannot be loaded into the boat by hand will be placed in a 2.5 m by 1.0 m stretcher and raised into the boat using a winch and davit. Once in the boat, fresh river water will be pumped through the stretcher during sampling. Fork length and girth will be measured in the stretcher. A biopsy will be performed on all presumed wild-origin White Sturgeon (i.e., no hatchery scute patterns) and a subset (up to five fish per day) of presumed hatchery-origin fish (i.e., fish with hatchery-release scute removal pattern) longer than 150 cm to determine the sex and stage of maturity following the index developed by Webb et al. (2019). Wild-origin sturgeon <100 cm will have a pectoral fin ray removed to determine age, using methods adapted from Rien and Beamesderfer (1994). A 1 cm section of the leading pectoral fin ray will be removed 0.5 cm from the knuckle. Oxytetracycline will be applied to the area surrounding the removed fin ray section.

7.3 Data Processing and Analysis

For each setline deployment, the date, time, latitude, longitude, and depth of the line will be recorded. Using a rugged laptop, all indexing field data (setline and recaptured fish data, including dates, times, locations, tag IDs, lengths, weights, etc.) will be entered *in situ*, directly into a Microsoft Access database developed specifically for this study by Blue Leaf. Analyses will be based only on setlines that are successfully retrieved. Comparisons of catch, sizes, and condition factor for each potential source (wild, CRITFC, Rocky Reach, etc.) will be completed.

Biometric data will be plotted (length vs. weight, length vs. girth, weight vs. girth), and visual outliers will be examined for data entry errors[2]. The QA/QC'ed recapture data will be used for analyses of size structure, condition factor, and abundance.

Fin rays will be processed (including section, mount, and age determination) by the Confederated Tribes of the Colville Reservation. The age determined from the fin ray will allow for the

[2] Quality assurance and control (QA/QC) procedures will include assessing pre-field planning, field checks to ensure data are collected and recorded properly and checking the quality of the deliverables.

assessment of the age structure of the wild population as well as assessing the environmental conditions present during years with wild recruitment.

Overall reservoir abundance of White Sturgeon will be estimated using a small-sample-size modified Peterson estimator (the 'Chapman' model; Chapman 1951). All analyses will be conducted in R (R Core Team 2021) and by using the recapr package (Tyers 2021). It is assumed that sample sizes will be limiting, precluding the use of more involved models (e.g., Jolly-Seber; Schwarz and Arnason 1996). However, if the dataset allows it, we will attempt to fit a set of Jolly Seber models, implemented using Program MARK (White and Burnham 1999), as described in Wright et al (2015). Comparisons of catch-per-unit effort to other mid-Columbia reservoirs will be used to validate estimates of abundance in the Rock Island Reservoir.

8.0 SCHEDULE, PERIODIC REPORTING, AND ON-GOING CONSULTATION

The first fishing effort to mark White Sturgeon will take place in July 2022. The follow up recapture fishing effort will occur in late summer or early fall (September/October) 2022. Summaries on catch data will be provided following each fishing session. Once both fishing sessions are complete and satisfactory statistical estimate of the population size is reached, a final report will be produced by the end of 2022.

The consultation record for this plan is included in Appendix A.

9.0 LEVEL OF EFFORT AND COST

At least one recaptured sturgeon will be needed to produce an abundance estimate, though confidence intervals and small-sample bias will be large at low recapture rates (Chapman 1951). Abundance would be underestimated by 43% if only one fish is recaptured, by 19% with two recaptured fish, 8% at three recaptured fish, and by very small biases thereafter. Unbiased estimates with low precision (order of magnitude) would still allow for characterization of the White Sturgeon population in the Rock Island Reservoir.

If ten wild White Sturgeon can be caught and marked in each fishing session the estimated abundance will follow the curve in Figure 9-1. If fewer than ten sturgeon are caught in each session the probability of not getting any recaptures (failed model) increases.

The amount of setline fishing effort required to catch ten wild White Sturgeon is expected to be 53 setlines, assuming sturgeon are caught at rates (0.19 sturgeon per line) similar to wild White Sturgeon populations in other reservoirs (Golder 2002, Golder 2003, Wright et al. 2015). If catch rates are lower than expected, then the number of days and cost required to tag and recapture will increase.

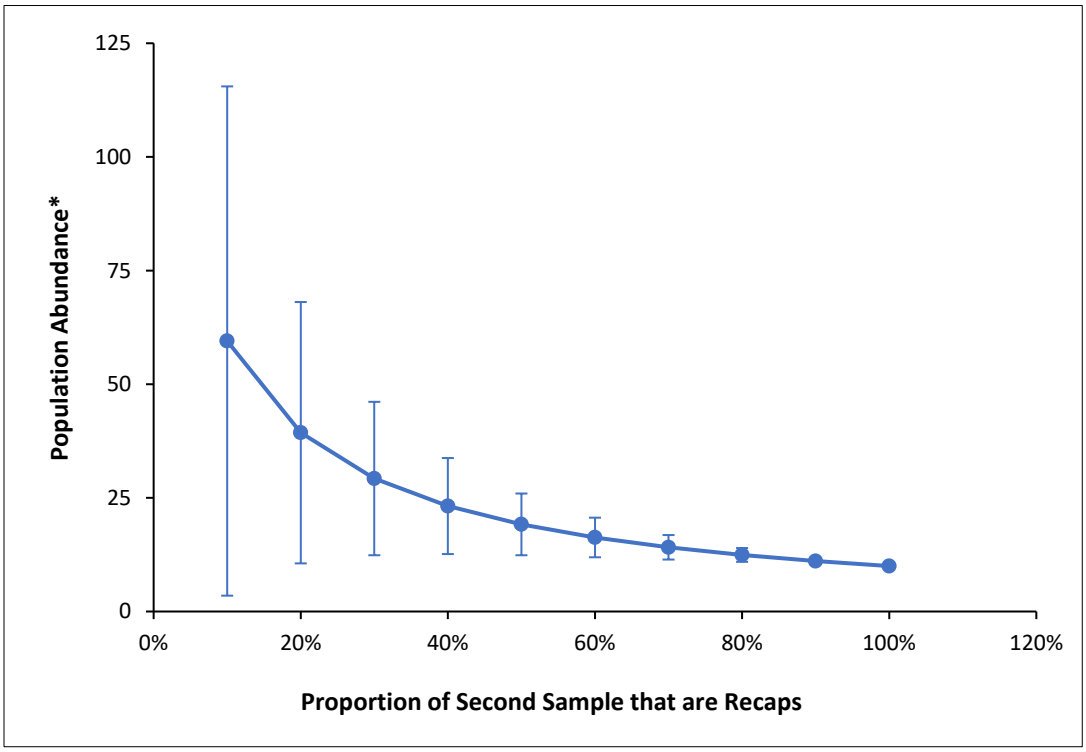

Figure 9-1 Population abundance as a function of recapture proportions

*Assuming ten sturgeon can be caught in each of the two setline fishing sessions

The initial 10-day (9 pull days) fishing session plus the follow-up fall 10-day session combined with preparatory work, analysis, and reporting is estimated to cost $86,532.

Should additional effort be required in either session to reach the desired number of mark and/or recaptured wild White Sturgeon, an additional 5-day effort (4 pull days) will be considered. The determination of a trigger for additional effort will be flexible and adaptive based on catch rates. Each additional fishing session is estimated to cost $15,720.

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APPENDIX A CONSULTATION RECORD

Chelan PUD submitted the draft White Sturgeon Population Indexing Study Plan to the Fish and Aquatic Technical Working Group (TWG) (see Table A-1) via email on June 13, 2022 for a 10-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table A-2 below.

Table A-1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
American Rivers	Bridget Moran
Attorney General WA	Lauren Kirigin
Audubon Society	Mark Johnston
Blue Leaf	Corey Wright
Blue Leaf	Dave Robichaud
Bureau of Indian Affairs	Keith Hatch
Cascade Fisheries	Jason Lundgren
Chelan PUD	Alene Underwood
Chelan PUD	Ben Truscott
Chelan PUD	Brian Odell
Chelan PUD	Catherine Willard
Chelan PUD	Janel Ulrich
Chelan PUD	Kate Taylor
Chelan PUD	Lance Keller
Chelan PUD	Marcie Clement
Chelan PUD	Scott Hopkins
Chelan PUD	William Towey
Columbia River Inter Tribal Fish Commission	Julie Carter
Columbia River Inter Tribal Fish Commission	Lauri Porter
Columbia River Inter Tribal Fish Commission	Tom Skiles
Colville Tribe	Bret Nine
Colville Tribe	Casey Baldwin
Colville Tribe	Douglas Marconi
Colville Tribe	Jason McLellan
Colville Tribe	Kirk Truscott
Confederated Tribes of the Umatilla Indian Reservation	Audie Huber
Confederated Tribes of the Umatilla Indian Reservation	Brent Hall

ORGANIZATION	NAME
Confederated Tribes of the Umatilla Indian Reservation	Aaron Jackson
Confluence Environmental Company	Eric Doyle
DNR	Cindy Preston
DNR	James Huinker
Ecology	Breean Zimmerman
Ecology	Mark Peterschmidt
Ecology	Tyson Oreiro
Four Peaks	Joe Miller
Four Peaks	Joshua Murauskas
Four Peaks	Pradeep Mugunthan
Golder	Paul Grutter
Individual	Steve Hays
Kearns & West	Angela Hessenius
Kearns & West	Ariella Dahlin
Kearns & West	Jim Downing
Kearns & West	Kelsey Rugani
Kearns & West	Mary Beth Day
Kleinschmidt	Audrey Thompson
Kleinschmidt	Kai Steimle
Kleinschmidt	MaryLouise Keefe
Kleinschmidt	Nathalie Denis
NOAA	Justin Yeager
NOAA	Scott Carlon
NPCC	Sara Mounts
NPCC	Stacy Horton
UCSRB	Tracy Bowerman
USBR	Gina Hoff
USBR	Shannon Archuleta
USFWS	Judy Neibauer
USFWS	Steve Lewis
USFWS	R.D. Nelle
USFWS	Sonja Kokos
USFWS	William Gale
WA-Parks	Andrew Fielding
WA-Parks	Chelsea Harris
WDFW	Andrew Murdoch
WDFW	Benjamin Blank

ORGANIZATION	NAME
WDFW	Chad Jackson
WDFW	Dave Burgess
WDFW	Laura Heironimus
WDFW	Patrick Verhey
Yakama Nation	Brandon Rogers
Yakama Nation	David Blodgett
Yakama Nation	Donella Miller
Yakama Nation	Elaine Harvey
Yakama Nation	Keely Murdoch
Yakama Nation	Ralph Lampman
Yakama Nation	Tom Iverson

Table A-2 Comments Received

Comment #	Comment Date	Name/Entity	Document or Report Name	Stakeholder Comment	Chelan PUD Response
T-1-1	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	SECTION 5.0 - EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION First Paragraph, second sentence: There is no record of any historic population assessment performed by any entities in the Rock Island Reservoir. Comment: The ODFW-WDFW BPA funded 1986-050-00 project completed a setline stock assessment survey for White Sturgeon in Rock Island Reservoir in 1998 (Devore et al. 2000). In addition, the 1986-050-00 project conducted a gillnet survey in the fall of 2004 or 2005 to evaluate the 2003 hatchery releases. Can't seem to track down the citation. You may want to contact Blaine Parker at CRITFC. DeVore, J.D., B.W. James, D.R. Gilliland, and B.J. Cady. 2000. Report B. Evaluate the success of developing and implementing a management plan for white sturgeon in reservoirs between Bonneville and McNary dams in enhancing production and describe the life history and population dynamics of subadult and adult white sturgeon upstream of McNary Dam and downstream from Bonneville Dam. Pages 41 to 74 in D. L. Ward, editor. White sturgeon mitigation and restoration in the Columbia and Snake rivers upstream from Bonneville Dam. Annual Progress Report to Bonneville Power Administration, Portland, Oregon. Project No. 198605000. Contract No. DE-AI79-86BP63584. Available at cbfish.org.	Information from DeVore et al. 2000 was added to Section 5.0 - Existing Information. Blue Leaf Environmental has been unable to obtain information on the 2004-2005 gillnet assessment from CRITFC.
T-1-2	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	7.1 Setlines, Paragraph 1, Fourth Sentence: A mixture of circle hook sizes (12/0, 14/0, and 16/0) will be used on each setline. Comment: May want to state that there will be 13 of two hook sizes and 14 of the third on each line.	Text in the study plan has been edited for clarity, as suggested. Thirteen of each hook size with a randomly selected 14th hook size will deployed on each setline.
T-1-3	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	7.1 Setlines, Paragraph 1, Fifth Sentence: The date, time, coordinates, and depth of each setline will be recorded.	Text in the study plan has been edited for clarity as suggested. Minimum and maximum depths will be recorded along each setline.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
				Comment: May want to be more specific of the depth (s) that will be recorded, as it is unlikely that the line will lay at one depth. Consider recording the minimum and maximum depths observed as each line is set.	
T-1-4	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	7.1 Setlines, General Question: What type of bait will be used?	Pickled squid from Gilmore Fish Smokehouse will be used as bait. Text of the study plan was modified to add clarity.
T-1-5	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	7.2 Fish Handling, Paragraph 1, First Sentence: White Sturgeon captured will be scanned for a PIT tag (BioMark Model HPR Lite Reader) and measured for fork length (cm), girth (cm), and weight (kg). Comment: The sturgeon captured during the 1998 survey were PIT tagged with 400 kHz PIT tags. The BioMark HPR Lite Reader will not read these tags. You will need to have a reader that reads 400 kHz tags on hand (i.e., Avid PowerTracker VIII). These fish will have a 2L,2R,8R (most likely) or 2L,8R scute scar pattern. These fish should also be examined for pectoral fin scars and a spaghetti tag near the dorsal fin.	The HPR lite reader has been successfully used to read 400 kHz AVID tags in sturgeon. BioMark has confirmed that the HPR lite reader will work with 400 kHz tags.
T-1-6	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	7.2 Fish Handling, Paragraph 1, Fourth Sentence: All sturgeon captured without a PIT tag will be implanted with a new tag (BioMark Model HPT12) on the left dorsal side, just posterior of the head; and the second left lateral scute will be removed to mark it as having a PIT tag. Comment: Clarifying that if you encounter a hatchery fish, based on scute scar pattern, that does not have a PIT tag and you apply a PIT tag, you will not also remove the second left lateral scute. That fish should not receive a new scute mark.	Text was added for clarity in the study plan. L2 will not be removed if fish have hatchery markings.
T-1-7	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	7.2 Fish Handling, General Question: During one of the Rock Island Aquatic Technical Group calls, you mentioned that tissue samples would be collected for genetic analysis. These samples are not included in this plan. Do you still plan to collect them?	Text was added in the study plan for clarity. DNA samples of all White Sturgeon encountered will be collected for processing by the CRITFC Hagerman Genetics Lab.
T-1-8	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	7.2 Fish Handling, General Question: The CTCR asked about collecting fin ray sections from wild (no scute scars, no tags) white sturgeon <100 cm FL captured during the survey on one of the Rock Island Aquatic Technical Group calls. Can the collection of these samples be added to this plan?	Text was added to the study plan objectives as well as in the fish handling and data processing and analysis sections. Fin ray samples from wild fish <100 cm will be processed by CTCR.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
T-1-9	6/21/22	Jason McLellan, Confederated Tribes of the Colville Reservation	Rock Island White Sturgeon Population Indexing Study Plan	General Comment: There are a couple of references to this study providing age structure information for the population (Section 6.0, last sentence; Section 7.0, first sentence), but that is not an objective (Section 2.0) and there are no field data collection methods (Section 7.2; i.e., fin ray sections collected) or data processing and analysis (Section 7.3) associated with ageing. You could obviously describe the age structure of the hatchery component of the population, but that wasn't specifically described. Consider removing any references to ageing or add more to describe what is to be done. As mentioned earlier, CTCR would like you to collect a pectoral fin ray section from any presumably wild fish <100 cm FL and we will section, mount, and age them. This is important for correlating recruitment with environmental conditions.	Text was added to the study plan objectives as well as in the fish handling and data processing and analysis sections. Fin ray samples from wild fish <100 cm will be processed by CTCR.
T-2-1	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	The sampling approach (setlines, reservoir-wide sampling distribution, two sampling passes) is appropriate and consistent with assessments of other sturgeon populations throughout the basin.	Comment noted. Thank you for your response.
T-2-2	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	Sample sizes (numbers of set line sets) seem reasonable. The sampling power for estimating sturgeon numbers will depend on catch which remains to be determined. There is a contingency for additional sampling if initial catches are not large. However clear agreement is needed on what numbers would trigger the additional sampling.	The determination of a trigger for additional fishing effort will be flexible and adaptive based on catch rates.
T-2-3	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	Accuracy and precision of population estimates will depend on the number of recaptures. The statement "at least one captured sturgeon will be needed to obtain a realistic abundance estimate" is not entirely accurate. The literature generally indicates that at least 4 recaptures are needed in Peterson/Chapman type two-sample mark –recapture estimators to avoid small sample bias (one recapture only lets you do math to get a number different from infinity).	Accuracy of estimates will be affected if very few fish are recaptured. Abundance would be underestimated by 43% if only one fish is recaptured, by 19% with two recaptured fish, 8% at three recaptured fish, and by very small biases thereafter. Unbiased estimates with low precision would still provide an idea of scale and allow for management decisions (e.g., hundreds of fish, rather than thousands of fish). The wording in the study plan has been altered to describe the effects of low recaptures more clearly.
T-2-4	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	Smaller sturgeon from more recent Rocky Reach releases may not yet be fully recruited to the setline gear, so estimates of their abundance should be considered minimum numbers. Use of smaller hook sizes in an attempt catch smaller sturgeon has generally not proven particularly effective due to reduced catchability of larger sturgeon, increased potential for hooking mortality, and increased bycatch.	Comment noted. Thank you for your response.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
T-2-5	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	To complement abundance estimates, analyses should also include catch-per-unit effort comparisons between Rock Island and other mid-Columbia River sturgeon assessments as an index of relative abundance. These estimates would help validate, at an order- of magnitude, abundance estimates from Rock Island.	Catch-per-unit effort analysis will be included in the study report. The study plan has been modified to include this analysis.
T-2-6	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	Analyses should also separately identify numbers, sizes, and condition factors of fish in the catch originating from the three potential sources (wild, CRITFC release, and Rocky Reach mitigation release).	These analyses will be included in the study report. The study plan has been modified to include these analyses.
T-2-7	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	Bait type was not mentioned in the study plan. The study plan also did not mention whether or not the circle hooks would be barbed.	Pickled squid from the Gilmore Fish Smokehouse will be used as bait. All circle hooks will be barbed. The text of the study plan was modified to add clarity.
T-2-8	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	We recommend that the study include a biopsy of all fish over 150 cm Fl to collect maturity data on hatchery fish to see how they compare with the wild fish; the study plan provides for biopsy of only wild fish.	Biopsy's will be performed on a subset (up to five fish per day) of hatchery-origin fish. Performing a biopsy on the majority of the catch would impede operations of the field effort. The study plan has been modified to reflect this change.
T-2-9	6/24/22	Keely Murdoch, Yakama Nation	Rock Island White Sturgeon Population Indexing Study Plan	We recommend that genetic samples be collected from all sturgeon handled in the Rock Island pool so that population fragmentation can be evaluated. These samples can be evaluated against samples collected, through this study or in coordination with other studies, in the Wanapum pool.	Text has been added in the study plan for clarity. DNA samples of all White Sturgeon encountered will be collected for processing by the CRITFC Hagerman Genetics Lab.
A-1-1	6/27/22	Laura Heironimus, Washington Department of Fish and Wildlife	Rock Island White Sturgeon Population Indexing Study Plan	Page 2 – Add the objective: Test either 1) all sampled fish for Spontaneous Autopolyploidy (SAP) and 2) all sizes of fish expected to be CRITFC fish to identify fish origin for removal from the population. a. Justification for testing/removal of SAP positive fish: includes the entrainment of hatchery origin fish from upriver sources which may include untested SAP positive fish. WDFW, along with the members of other Mid-Columbia fish forums, are already taking steps to minimize the occurrence of SAP positive fish in other areas of the river. i. Blue Leaf could test sturgeon in real-time on the boat (if they have a Coulter Counter they could use) and remove	Testing for Spontaneous Autopolyploidy (SAP) and removal of CRITFC-released fish are noted co-manager management objectives; however, these objectives are beyond the primary objectives of this study and would add considerable logistic challenges and may impede meeting the primary study objectives. Neither Chelan PUD nor Blue Leaf Environmental possess a Coulter Counter, nor are aware of any entities willing to loan a Coulter Counter for deployment on a setline fishing boat. While collection of blood samples at a later date is an option, performing this during the first fishing session would require delaying the effort to obtain supplies and reach agreements with testing facilities. Chelan PUD is open to discussing collecting blood samples in future study years.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
				them immediately or test later and add to a removal list to recapture and remove later.	
A-1-2	6/27/22	Laura Heironimus, Washington Department of Fish and Wildlife	Rock Island White Sturgeon Population Indexing Study Plan	Page 2 – Add the objective: Test either 1) all sampled fish for Spontaneous Autopolyploidy (SAP) and 2) all sizes of fish expected to be CRITFC fish to identify fish origin for removal from the population. b. Justification for testing/removal of CRITFC fish: WDFW already attempted to remove CRITFC fish from other pools (as noted on page 6), but it is unknown if these fish exist in this pool and the low allelic diversity of CRITFC fish. i. Genetic samples could also be analyzed to identity CRITFC fish, which came from the Pelfrey facility and were of below Bonneville Dam origin.	Removal of all CRITFC-released fish may impede the ability to develop an overall population abundance estimate, as CRITFC-released fish will likely constitute most of the catch. Obtaining overall abundance and population metrics is the primary objective of this study. Removal of CRITFC-released fish may be possible in future study years, however, removing CRITFC fish in the first year of the study may be detrimental in meeting the primary study objectives. Regarding genetic testing to identify CRITFC fish, all CRITFC-released sturgeon are scute marked with two scute patterns and are easily identifiable in the field. DNA samples will be taken on all fish encountered as an archive as well as assisting other studies at the CRITFC Hagerman genetics lab.
A-1-3	6/27/22	Laura Heironimus, Washington Department of Fish and Wildlife	Rock Island White Sturgeon Population Indexing Study Plan	Page 3 – Addition to sentence "White Sturgeon is not listed as a threatened or endangered species under the U.S. Endangered Species Act within the Columbia River, Washington." a. White Sturgeon are listed as endangered under the US Endangered Species Act in the Kootenai River in Idaho (https://ecos.fws.gov/ecp/species/8241), and are SARA listed within the Upper Fraser River, Upper Columbia River, Upper Kootenay River, and Nechako River in Canada (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/related-information/summary-white-sturgeon.html)	Text in the study plan was edited as suggested.
A-1-4	6/27/22	Laura Heironimus, Washington Department of Fish and Wildlife	Rock Island White Sturgeon Population Indexing Study Plan	Page 7 – Suggested edit: "White Sturgeon are a large, long-lived native fish in the Columbia River. Historic population levels of White Sturgeon have declined **in recent years** due to many anthropogenic factors including overharvest, pollution, dam construction, and habitat alteration (Hilebrand et al. 2016)." Alter the highlighted text to: "within the past 150 years".	Text in the study plan was edited as suggested.
A-1-5	6/27/22	Laura Heironimus, Washington	Rock Island White Sturgeon Population	Page 8 – Fish Handling/Data Processing and Analysis: Please incorporate methods for blood collection and SAP testing.	See response to A-1-1.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
		Department of Fish and Wildlife	Indexing Study Plan		
A-1-6	6/27/22	Laura Heironimus, Washington Department of Fish and Wildlife	Rock Island White Sturgeon Population Indexing Study Plan	Page 10 – schedule: is this really happening now when the study plan review isn't due until June 27?	The initial fishing session has been moved to July, allowing for a two-week comment period.
A-1-7	6/27/22	Laura Heironimus, Washington Department of Fish and Wildlife	Rock Island White Sturgeon Population Indexing Study Plan	Page 11/12 – Please incorporate costs for SAP testing.	See response to A-1-1.
A-1-8	6/27/22	Laura Heironimus, Washington Department of Fish and Wildlife	Rock Island White Sturgeon Population Indexing Study Plan	Corrected Citation: a. In study plan: Webb MAH, Van Eenennaam JP, Crossman JA, Chapman FA. A practical guide for assigning sex and stage of maturity in sturgeons and paddlefish. J Appl Ichthyol. 2017;00:1–18. b. Should be edited to: Webb, MAH, Van Eenennaam, JP, Crossman, JA, Chapman, FA. A practical guide for assigning sex and stage of maturity in sturgeons and paddlefish. J Appl Ichthyol. 2019; 35: 169– 186. https://doi.org/10.1111/jai.13582	Citation has been corrected.

Kate Taylor

From: RIRelicensing
Sent: Monday, June 13, 2022 10:54 AM
To: RIRelicensing
Cc: Janel Ulrich; 'Benjamin.Blank@dfw.wa.gov'; 'sghays51@msn.com'; Marcie Clement; 'dave.burgess@dfw.wa.gov'; 'tracy.bowerman@ucsrb.org'; 'bmoran@americanrivers.org'; 'jason@ccfeg.org'; 'Tom D. Skiles'; 'murk@yakamafish-nsn.gov'; 'kirk.truscott@colvilletribes.com'; 'bzim461@ecy.wa.gov'; 'stephen_lewis@fws.gov'; 'Andrew.Murdoch@dfw.wa.gov'; 'Patrick.Verhey@dfw.wa.gov'; 'Nathalie.Denis@Kleinschmidtgroup.com'; 'Sonja_Kokos@fws.gov'; Alene Underwood; 'andrew.fielding@parks.wa.gov'; 'Audrey.Thompson@kleinschmidtgroup.com'; 'rogb@yakamafish-nsn.gov'; 'brenthall@ctuir.org'; Brian Odell; Catherine Willard; 'chad.jackson@dfw.wa.gov'; 'Chelsea.Harris@parks.wa.gov'; 'cindy.preston@dnr.wa.gov'; 'blod@yakamafish-nsn.gov'; 'mild@yakamafish-nsn.gov'; 'hare@yakamafish-nsn.gov'; 'James.Huinker@dnr.wa.gov'; 'kai.steimle@kleinschmidtgroup.com'; 'keith.hatch@indianaffairs.gov'; Lance Keller; 'laura.heironimus@dfw.wa.gov'; 'marylouise.keefe@kleinschmidtgroup.com'; 'lamr@yakamafish-nsn.gov'; Scott Hopkins; Ben Truscott; 'shorton@nwcouncil.org'; 'ivet@yakamafish-nsn.gov'; 'william_gale@fws.gov'; Bill Towey; 'RD_Nelle@fws.gov'; 'judy_neibauer@fws.gov'; 'jason.mclellan@colvilletribes.com'; 'bret.nine@colvilletribes.com'; 'aaronjackson@ctuir.org'; 'justin.yeager@noaa.gov'; 'porl@critfc.org'; 'Casey.Baldwin@colvilletribes.com'; 'Douglas.Marconi@colvilletribes.com'; 'scott.carlon@noaa.gov'; 'mape461@ecy.wa.gov'; 'pmugunthan@fourpeaksenv.com'; 'lauren.kirigin@atg.wa.gov'; 'ghoff@usbr.gov'; 'cwright@lgl.com'; 'drobichaud@lgl.com'; 'AudieHuber@ctuir.org'; 'jmiller@fourpeaksenv.com'; 'sarchuleta@usbr.gov'; 'tore461@ECY.WA.GOV'; 'Julie Carter'; 'adahlin@kearnswest.com'; 'AHessenius@kearnswest.com'; 'eric.doyle@confenv.com'; 'jdowning@kearnswest.com'; 'mbday@kearnswest.com'; 'Paul_Grutter@golder.com'; 'SMounts@NWCouncil.org'; 'toxostoma495@gmail.com'; 'Joshua Murauskas'
Subject: Rock Island Relicensing: White Sturgeon Population Indexing Study Plan - Comment Opportunity

Good morning, Fish & Aquatic TWG:

Here is the link to comment on the Rock Island White Sturgeon Population Indexing Study Plan. Click the link to access the document and submit your comments.

Comments are to be submitted by EOD Monday, June 27.

Thank you for your participation.

Kate Taylor
Licensing & Compliance Specialist
Chelan PUD
[M] 509-899-5555
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Public Comment Form

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Rock Island White Sturgeon Population Indexing Study Plan

Chelan County PUD invites stakeholders to provide comments on our draft study plan. Please review the document (click "review document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

Your Comment

Comments must be submitted by June 27, 2022

Review Document

Insert comments on Rock Island White Sturgeon Population Indexing Study Plan

Upload File

"Uploading a file is optional"

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment, please contact the person listed at the bottom of this page.

WHITE STURGEON POPULATION INDEXING STUDY REPORT - FINAL

ROCK ISLAND HYDROELECTRIC PROJECT

FERC NO. 943

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY

327 N. WENATCHEE AVENUE

WENATCHEE, WA 98801

August 2023

WHITE STURGEON POPULATION INDEXING STUDY REPORT – FINAL

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

BLUE LEAF ENVIRONMENTAL
A MEMBER OF THE LGL GROUP OF COMPANIES

LGL

August 2023

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TERMS AND ABBREVIATIONS

A	
ANOVA	analysis of variance
B	
BRZ	boat restricted zone
C	
Chelan PUD	Public Utility District No. 1 of Chelan County
CL(s)	confidence limit(s)
Colville Tribes	Confederated Tribes of the Colville Reservation
CPUE	catch per unit effort
CRITFC	Columbia River Inter-Tribal Fish Commission
D	
Douglas PUD	Douglas County Public Utility District No. 1
F	
FERC	Federal Energy Regulatory Commission
FL	fork length
G	
GPS	global positioning system
I	
ILP	Integrated Licensing Process
K	
kcfs	thousand cubic feet per second
N	
NMFS	National Marine Fisheries Service
P	
PIT	Passive Integrated Transponder
R	
RM	river mile
Rock Island Project	Rock Island Hydroelectric Project FERC No. 943
W	
WDFW	Washington Department of Fish and Wildlife
W_r	relative weight

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission (FERC) Project No. 943) (Rock Island Project). The Rock Island Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Rock Island Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Rock Island Project, which will utilize the Integrated Licensing Process (ILP). Chelan PUD intends to incorporate findings of this report in the Pre-Application Document, which will be filed with FERC and distributed to relicensing participants when the ILP commences in late 2023.

A White Sturgeon (*Acipenser transmontanus*) population indexing study was conducted in support of the Rock Island Project relicensing, as described in the White Sturgeon Population Indexing Study Plan (Blue Leaf 2022). This report presents findings from population indexing efforts conducted in 2022.

1.1 Background on White Sturgeon in Rock Island Reservoir

Historically, there is little known about the status of the White Sturgeon population in the Rock Island Reservoir. Two population assessments were previously completed. In 1998, a Washington Department of Fish and Wildlife (WDFW) stock assessment was performed (DeVore et al., 2000). Ninety-five setlines were fished and only four sturgeon were captured, ranging from 56.7-75.6 in. (144-192 cm) fork length (FL). Population size could not be estimated with only one sampling period and so few recaptures. In 2003, the Columbia River Inter-Tribal Fish Commission (CRITFC) released 20,600 hatchery-origin juvenile White Sturgeon in the Rock Island Reservoir. An additional population assessment was conducted by CRITFC in 2006 over a five-day span in July and August. CRITFC fished 50 setlines and captured 36 of the hatchery-origin fish, ranging from 17.3-26.8 in. (44-68 cm) FL (B. Parker, personal communication, January 13, 2023).

In 2010, an annual hatchery supplementation program was initiated by Chelan PUD in the Rocky Reach Reservoir, immediately upstream of the Rock Island Reservoir. Between 2011 and 2022, 36,806 one-year-old sturgeon were released into the Rocky Reach Reservoir, and annual releases are ongoing. Telemetry studies conducted to monitor and evaluate this effort have estimated that 9.5% of the fish released in the Rocky Reach Reservoir have emigrated downstream into the Rock Island Reservoir or beyond (Robichaud et al. 2021).

2.0 STUDY GOALS AND OBJECTIVES

The primary goal of this study was to determine the status and characterize the population of White Sturgeon in the Rock Island Reservoir. The study was based on the issue statement developed by the Fish and Aquatic Technical Working Group during early engagement, which stated:

"No White Sturgeon population age and size structure, genetic diversity, or abundance data are available to assess potential effects of population fragmentation."

The study objectives include the following:

- Capture and mark as many White Sturgeon as feasible in an initial setline fishing session;
- Follow-up initial setline fishing session with additional fishing sessions to recapture a large enough portion of the population to assess the mark rate (proportion of White Sturgeon that bear a mark), such that population size can be determined with a reasonable level of statistical precision; and
- Obtain biometric data, including length, girth, weight, and origin (through scute removal patterns) from all captured fish, as well as age, sex, and stage of maturation from captured adults over 59.1 in. (150 cm) FL.

3.0 STUDY AREA

The Rock Island Project is located on the Columbia River near the cities of Wenatchee and East Wenatchee in Chelan County and Douglas County, Washington, from river mile (RM) 453.4 to RM 473.7 (NMFS 2002). The Study Area encompassed the Rock Island Reservoir, excluding the boat restriction zones (BRZ) in the forebay of Rock Island Dam and the tailrace of Rocky Reach Dam (Figure 3-1). The Study Area extended slightly beyond the northern extent of the Rock Island Project Boundary, into the Rocky Reach Project Boundary, to thoroughly characterize the population of White Sturgeon in the Rock Island Reservoir.

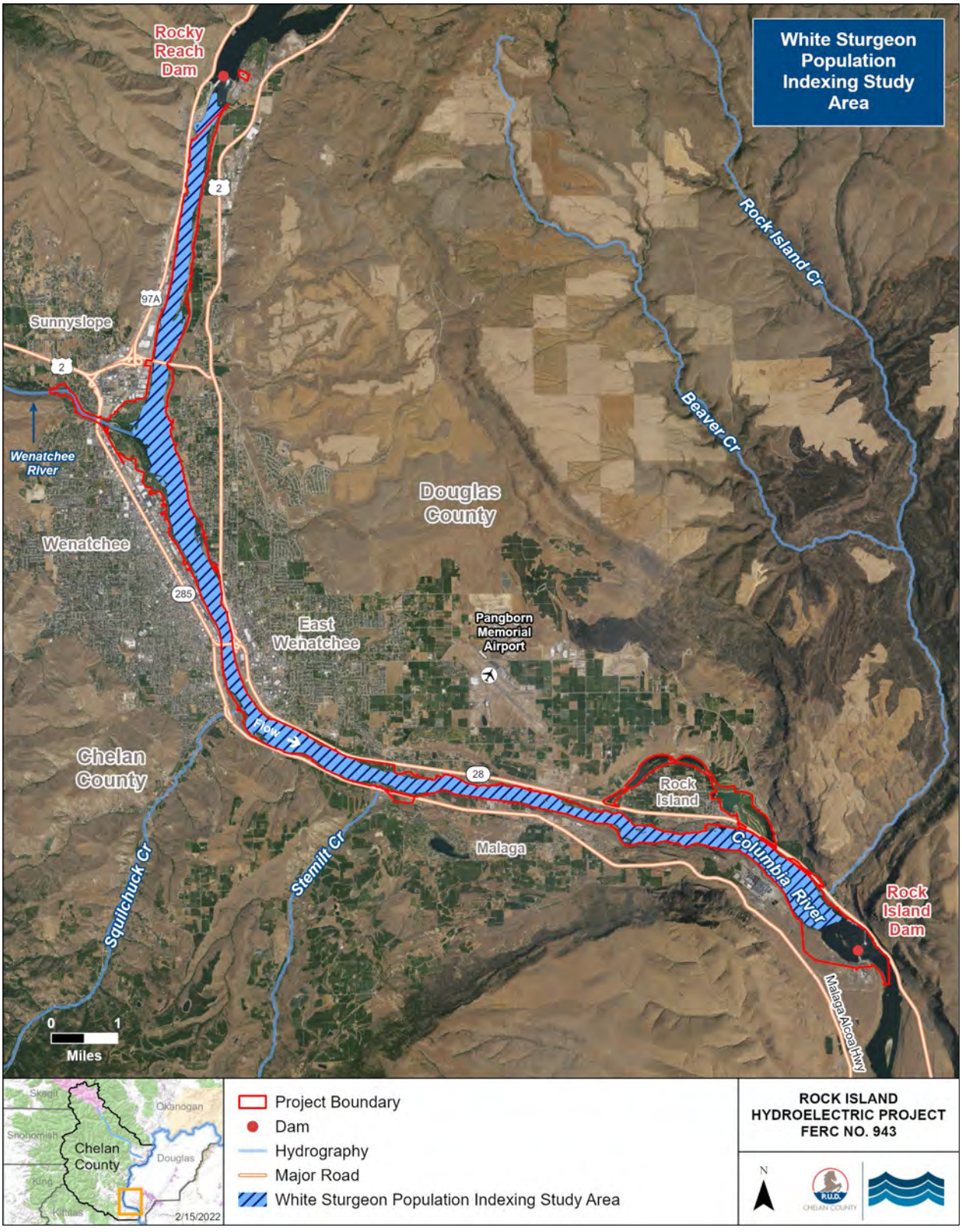


Figure 3-1 White Sturgeon Population Index Study Area

4.0 METHODS

Setline fishing and mark-recapture methods were used to generate population estimates and characterize the population of White Sturgeon in the Rock Island Reservoir. Methods outlined in this report were consistent with the White Sturgeon Population Indexing Study Plan (Chelan PUD 2022).

4.1 Setline Fishing

The capture of White Sturgeon was conducted using setlines comprised of a 600 ft mainline, anchored at both ends with 30-lb sections of rail track, and with 40 barbed circle hooks (Model Mustad MUS39965) spread evenly (Photo 4-1); a method adapted from Elliot and Beamesderfer (1990). Eight or nine setlines were deployed each day and retrieved the following day (approximately 19-hour soak time). A mixture of circle hook sizes (12/0, 14/0, and 16/0) was used. Thirteen of each hook size with an additional 14th hook of a randomly selected size were deployed on each setline. Hooks were baited with pickled squid from the Gilmore Fish Smokehouse (Dallesport, WA). The date, time, coordinates, and the minimum, maximum and mean depth of each setline was recorded. Coordinates were recorded using a handheld global positioning system (GPS) device in WGS84. Latitude, longitude, and depths were recorded with the fishing vessel's depth sounder (Lowrance HDS9).

Setline fishing occurred over two sessions (shaded areas in Figure 5-1). Each fishing session included:

- A number of setlines that were deployed in randomly selected areas; and
- Setlines deployed in targeted areas that were either known or expected to produce higher numbers of catches.

Geographic information system software (esri ArcGIS) was used to generate randomized fishing locations within the Rock Island Reservoir where depth exceeded 12 ft and there was a minimum buffer of 150 ft from the other randomly selected fishing locations. Each initial session was planned to run for nine days of fishing, followed by a short period of data processing to assess the need for additional fishing effort.

Source: Blue Leaf 2022

Photo 4-1 Crew Attaching Baited Circle Hooks on Leaders with Snaps to the Mainline during Setting of the Line

4.2 Fish Handling

Captured White Sturgeon were scanned for a Passive Integrated Transponder (PIT) tag (BioMark Model HPR Lite Reader) and measured for fork length (FL; in.), girth (in.), and weight (lb). Girth was measured directly behind the pectoral fins. Each sturgeon captured was examined for removed scutes (indicating hatchery origin), and if applicable, the location and pattern of the removed scutes were documented. All sturgeon captured without a PIT tag were implanted with a new PIT tag (BioMark Model HPT12) on the left dorsal side, just posterior to the head. Wild fish without hatchery scute mark patterns had the second left lateral scute removed to mark it as having a PIT tag. No additional scutes were removed from fish with previous scute marks. A DNA sample was taken from all sturgeon captured (small fin clip from a pelvic fin) and preserved on Whatman sheets for DNA processing. DNA samples will be processed and archived by the CRITFC

Hagerman Genetics Laboratory. All injuries or abnormalities (e.g., stunted or missing fins) were documented. All fish captured were released near their capture location immediately after measurements (and other processing, see below) were completed. The hook size that each sturgeon was captured with was also noted. Bycatch was recorded (quantity and species) and then released.

White Sturgeon too large to be loaded into the boat by hand were placed in an 8-foot by 3-foot stretcher and raised into the boat using a winch and davit. Once in the boat, fresh river water was pumped through the stretcher during sampling. Fork length, girth, and weight were measured in the stretcher.

4.3 Sex, Maturity, and Aging

A biopsy was performed on all fish with an FL longer than 59.1 in. (150 cm) to determine the sex and stage of maturity, following the techniques and maturation index outlined by Webb et al. (2019). An approximately 0.6 in. (1.5 cm) incision was made about an inch (1-3 cm) from the ventral mid-line, opposite 4-5 ventral scutes anterior from the pelvic fin. The gonad was observed using an otoscope, and the sex and stage of maturation were assigned into the following categories: non-reproductive males (M1-4, M7), reproductively active males (M-5-6), previtellogenic[1] females (F1-2), vitellogenic females (F3-4), spawning condition females (F5-6), post-spawn females (F7), and atretic females (F8). Following the assignment of sex and stage of maturity, the incision was closed with two sutures (Ethicon PDS*II Size 0, CP-1) using a 3-2-1-1 knot.

Wild-origin White Sturgeon with less than a 39.4 in. (100 cm) FL had a pectoral fin ray removed to determine age using methods adapted from Rien and Beamesderfer (1994). An approximately 0.4 in. (1 cm) section of the leading left pectoral fin ray was removed 0.2 in (0.5 cm) from the knuckle and preserved in gauze and envelopes for later laboratory aging by the Confederated Tribes of the Colville Reservation (CTCR) Fish and Wildlife Group. At the laboratory, fin ray samples were mounted in epoxy resin (EpoFix) and then cut into a series of thin sections (0.04 in. [1 mm] thickness) using a low-speed precision saw (Buehler Isomet 1000) with a cutting blade thickness of 0.02 in. (0.5 mm) and a cutting speed of 250 rpm. Samples were sectioned in their entirety because they were generally less than 0.4 in. (1 cm) in length. Following cutting, sections were affixed to glass microscope slides using clear-coat aerosol paint in the order they were cut and

[1] Vitellogenesis is the process through which maturing oocytes in the ovary accumulate yolk.

then imaged using a dissecting microscope (Leica M165) and digital camera (Leica DFC450 C). Up to seven thin section images from each sample and an image of the sample taken prior to cutting are presented below. For each sample, the thin section images are numbered and arranged in a proximal-distal sequence relative to the fin articulation. Aging was performed independently by two Colville Tribe staff members using the obtained images.

4.4 Data Collection, Processing and Analysis

For each setline deployment, the date, time, latitude, longitude, and depth (minimum, mean, maximum) of the line were recorded. The mean depth of a line was assigned as the capture depth for all fish caught. Using a rugged laptop, all indexing field data (setline and recaptured fish data, including dates, times, locations, tag IDs, lengths, weights, etc.) were entered *in situ*, directly into a Microsoft Access database developed by Blue Leaf specifically for this study. Biometric data were plotted (length vs. weight, length vs. girth, weight vs. girth) and visual outliers were examined for data entry errors. The reviewed recapture data were used for analyses of size structure, relative weight, and abundance.

The population of White Sturgeon in the Rock Island Reservoir was assumed to be comprised of three component groups: wild fish, CRITFC fish, and supplementation fish. Sturgeon bearing no scute marks and without a PIT tag were assumed to be of wild origin. “CRITFC fish” were hatchery fish that were tagged and released by the CRITFC program in 2003, and which bore two different scute markings, either L3,R11 (without PIT tags) or L2,3,10 (with PIT tag). “Supplementation fish” were hatchery fish that were tagged and released since 2011 in upstream reservoirs by either Chelan PUD (L16-21 scute mark) or by Douglas County Public Utility District No. 1 (Douglas PUD; R16-21 scute mark), all of which bore a PIT tag.

Catch, size, and relative weight were compared among the population components (wild, CRITFC, supplementation). Relative weight (W_r, expressed as a percentage) was calculated by dividing the measured weight of captured fish by the expected (from a regression equation by Beamesderfer 1993) weight of a fish of that length. In instances where a fish was captured more than once, only measurements from the first capture event were used in calculating length, weight, and relative weight.

Catch per unit effort (CPUE) was calculated as the number of fish caught per setline deployed. Comparisons of CPUE among sessions or among deployment types (random vs. targeted) were made using generalized linear models with negative binomial error structure.

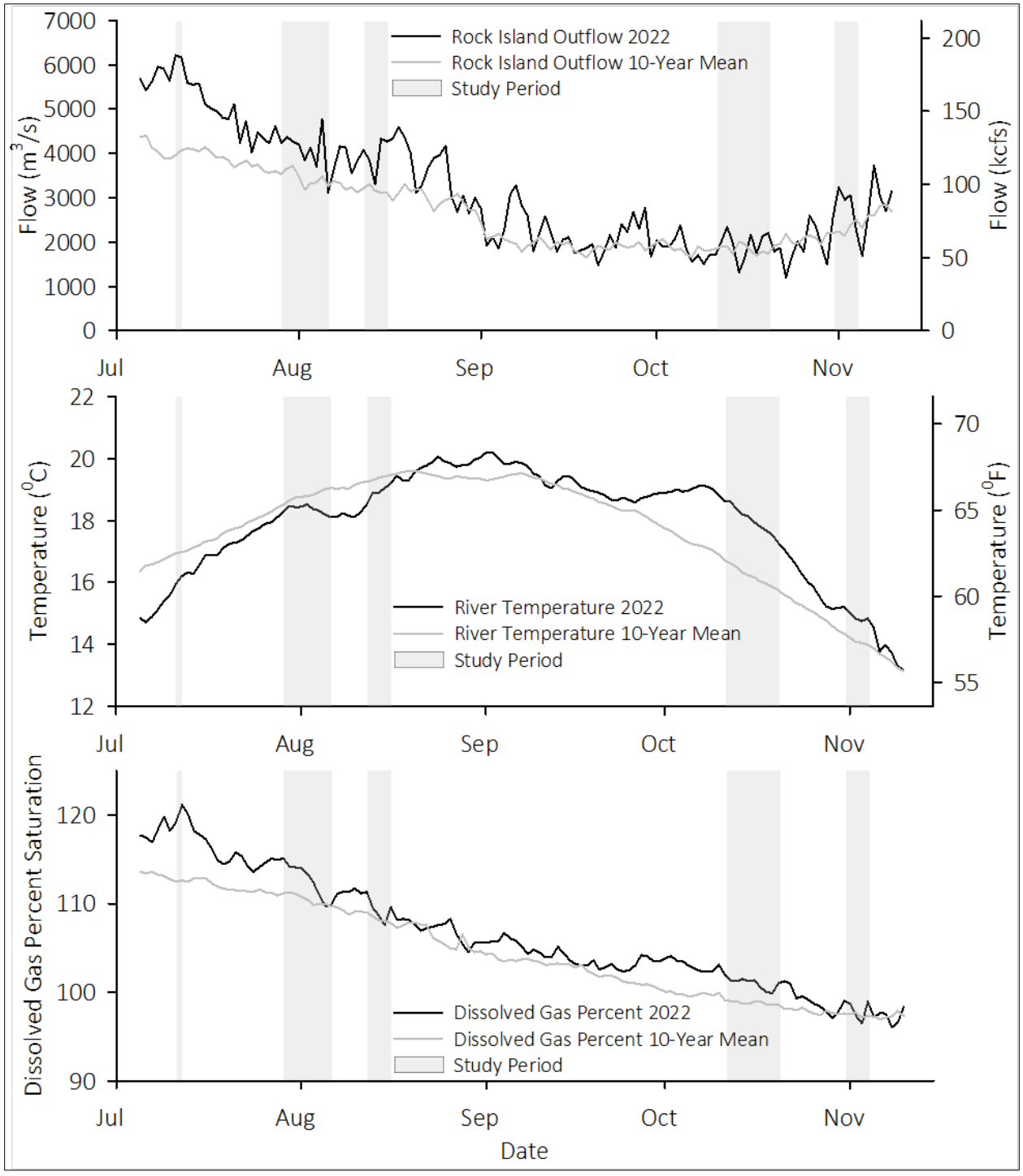
The overall Rock Island Reservoir sturgeon abundance was estimated using a small-sample-size modified Petersen estimator (the ‘Chapman’ model; Chapman 1951). Where possible, the same

method was used to estimate the reservoir abundances for the individual component groups (i.e., wild, supplementation, CRITFC). However, when sample sizes were too low for a component group to effectively use the modified Petersen estimator, the overall abundance in the reservoir was partitioned among the component groups based on their relative catch proportions (i.e., proportion method). Given that the use of simple models is expected to be limited by low sample sizes (e.g., low numbers of recaptures in the second session), the use of more involved models (e.g., Jolly-Seber; Schwarz and Arnason 1996) was not considered. All analyses were conducted in R (R Core Team 2021) and by using the recapr package (Tyers 2021). Spatial data were displayed using esri ArcMap 10.6.

5.0 RESULTS

5.1 Environmental Conditions

Daily flow levels in the Rock Island Reservoir in July and August were 29,000 cubic feet per second (kcfs) higher on average than the 10-year mean (range -5 to 79 kcfs; Figure 5-1). Although the study was initiated on July 11, 2022, safety concerns related to high flows required further work to be delayed until July 29, 2022. Daily flows during October and November remained higher than the 10-year mean, but only by 8 kcfs on average (range -24 to 35 kcfs). Daily river temperature was 1.1°F (0.6 °C) cooler than the 10-year mean during July and August (range 0.36 °F [0.2 °C] to 1.8 °F [1.0 °C]) and 2.7 °F (1.5 °C) warmer than the 10-year mean during October and November (range 1.26 °F (0.7 °C) to 3.6 °F (2.0 °C). Dissolved gas levels were fairly close to the 10-year mean, at an average of 2.4% higher (range -0.5 to 8.5%) in July and August and an average of 1.7% higher (-0.7 to 2.9%) in October and November.



Data source: https://www.cbr.washington.edu/dart/query/river_graph_text

Figure 5-1 River Flow (top), Temperature (middle), and Dissolved Gas (bottom) at Rock Island Dam, Along with the 10-year Means

5.2 Sampling Effort and Catch Rates

The first sampling session (Session One) began on July 11, 2022 but was suspended on July 12, 2022 for safety concerns associated with unseasonably high river flows. Session One resumed on July 29 and continued through August 6, 2022 including five random fishing days and four targeted fishing days. Additional fishing effort for the first session was deemed necessary to reach the desired number of mark and/or recaptured wild White Sturgeon. Therefore, four additional targeted fishing days occurred from August 12 to 16, 2022. The second recapture session (Session Two) was initiated on October 11 and continued through October 20, 2022 including five random fishing days and four targeted fishing days. An extra fishing effort in Session Two was also deemed necessary and four additional targeted days were completed from October 31 to November 4, 2022.

During Session One, 116 setlines were deployed, and 112 White Sturgeon capture events were recorded (0.97 fish per setline; Table 5-1) including nine events involving wild fish, seven involving CRITFC fish, and 96 involving hatchery supplementation fish from upstream (92 unique individuals). In the first session, 45 setlines were deployed in randomized locations, and 71 were deployed in targeted locations. CPUE was 0.22 fish per setline for random locations, as compared to 1.44 fish per setline for targeted locations, a difference that was statistically significant (Dev = 22.3, $P < 0.0001$).

Table 5-1 Catch per Unit Effort Values by Sampling Type, Session, and Origin

SAMPLING TYPE	SESSION	CHELAN HATCHERY[1]	DOUGLAS HATCHERY[2]	CRITFC	WILD	ALL ORIGINS
Random	Session One	0.16	0.00	0.07	0.00	0.22
	Session Two	0.73	0.07	0.22	0.04	1.07
	Overall	0.44	0.03	0.14	0.02	0.64
Targeted	Session One	1.21	0.04	0.06	0.13	1.44
	Session Two	1.20	0.04	0.08	0.10	1.42
	Overall	1.20	0.04	0.07	0.11	1.43
Overall	Session One	0.80	0.03	0.06	0.08	0.97
	Session Two	1.02	0.05	0.14	0.08	1.28
	Overall	0.91	0.04	0.10	0.08	1.13

Note: Green color gradient have been applied to values to visualize range.
[1]Chelan PUD Supplementation program
[2]Douglas PUD Supplementation program

During Session Two, 116 setlines were deployed, and 149 White Sturgeon capture events were recorded (1.28 fish per setline; Table 5-1) including nine events involving wild fish (eight unique

individuals), 16 involving CRITFC fish, and 124 involving hatchery supplementation immigrants from upstream programs (117 unique individuals). The catch rate in Session Two was not significantly different from that in Session One (Dev = 1.8, *P* = 0.17). During the second session, 45 setlines were deployed in randomized locations, and 71 were deployed in targeted locations. The random-location CPUE (1.07 fish per setline) was not significantly different from that for targeted locations (1.42 fish per setline; Dev = 1.2, *P* = 0.27).

Catch rates of White Sturgeon originating from the upstream Chelan PUD Supplementation program (overall CPUE 0.91) were substantially higher than those for CRITFC fish (0.10), wild fish (0.08), or those originating from the Douglas PUD Supplementation program (0.04; Table 5-1). During randomized fishing, the catch rates of all components increased between Sessions One and Two. Between sessions, CPUE for Chelan PUD-origin fish in random fishing locations increased significantly from 0.16 to 0.73 fish per setline (Dev = 13.4, *P* = 0.0003) and that for Douglas PUD-origin fish increased significantly from 0.0 to 0.07 fish per setline (Dev = 4.2, *P* = 0.04). Between sessions, CPUE for wild fish in random fishing locations increased from 0.0 to 0.04 fish per setline (Dev = 2.8, *P* = 0.10), while for CRITFC fish CPUE increased from 0.07 to 0.22 fish per setline (Dev = 3.0, *P* = 0.08); these increases were not statistically significant. By contrast, CPUE at targeted fishing locations did not change markedly between sessions for any of the components (Chelan PUD: 1.21 to 1.20 fish per setline, Dev = 0.002, *P* = 0.96; Douglas PUD: 0.04 fish per setline in both sessions, Dev = 0, *P* = 1; Wild: 0.13 to 0.10 fish per setline, Dev = 0.13, *P* = 0.71; and CRITFC: 0.06 to 0.08 fish per setline, Dev = 0.28, *P* = 0.59).

Bycatch during all fishing sessions consisted of seven Northern Pikeminnow *Ptychocheilus oregonensis*.

5.3 Population Abundance

5.3.1 Overall

In the setline data, there were 108 White Sturgeon caught in Session One, and 141 captured in the Session Two, of which 29 were recaptures from Session One. The modified Petersen calculation resulted in an overall abundance estimate of 515 fish. The variance was 4,909, and the 95% confidence limit (CL) ranged from 377 to 652 fish (Table 5-2).

5.3.2 Wild Fish

Nine wild-origin White Sturgeon were caught in Session One, and eight were caught in Session Two, of which two were recaptures from Session One. The modified Petersen calculation resulted

in a wild-origin population estimate of 29 fish. The variance was 105, and the 95% CL ranged from 9 to 49 fish.

Table 5-2 Catch of Individuals by Session, and Abundance Estimates by Origin

ORIGIN	FISH MARKED IN SESSION ONE	FISH EXAMINED IN SESSION TWO	RECAPS IN SESSION TWO	TOTAL INDIVIDUALS	PROP. OF INDIVIDUALS	ABUNDANCE EST.*	95% CONFIDENCE LIMITS
Supple-mentation	92	117	27	182	82.7%	391	287-495
CRITFC	7	16	0	23	10.5%	54	39-68
Wild	9	8	2	15	6.8%	29	9-49
Total	108	141	29	220		515	377-652

*Supplementation and wild-origin population estimates are derived from Petersen calculations while CRITFC is a proportional estimate.

5.3.3 Supplementation Immigrants

Ninety-two White Sturgeon from upstream hatchery supplementation programs were caught in Session One, and 117 in Session Two, of which 27 were recaptures from Session One. The modified Petersen calculation resulted in an estimated abundance of 391 supplementation fish. The variance was 2,624, and the 95% CL ranged from 287 to 495 fish.

5.3.4 CRITFC Fish

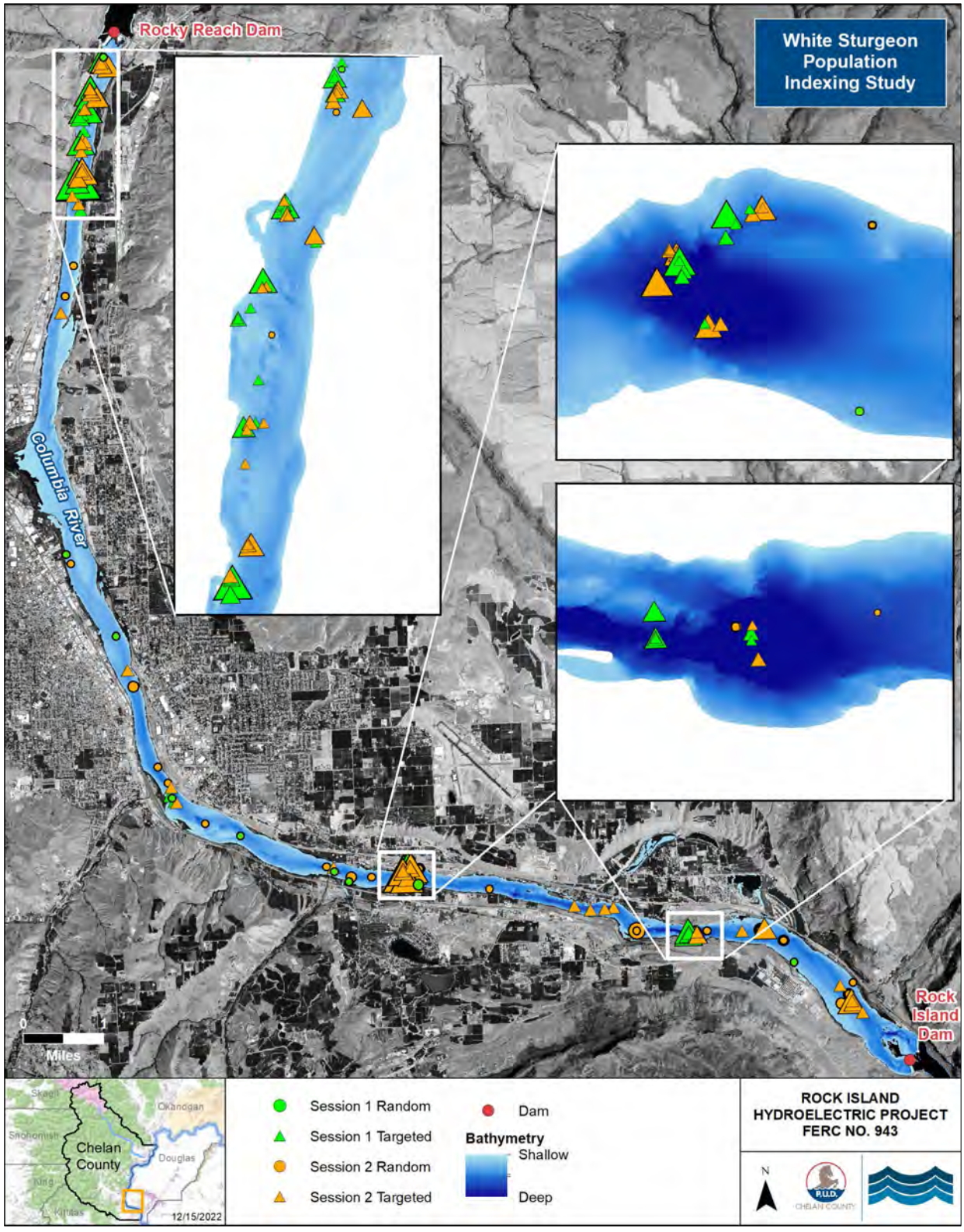
There were seven CRITFC White Sturgeon caught in Session One, and 16 in Session Two. No fish in Session Two were recaptures from Session One. The modified Petersen calculation resulted in an estimated abundance of 135 CRITFC fish. The variance was 7,616, and the 95% CL ranged from -36 to 306 fish. Given the lack of recaptures, the modified Petersen calculation produced an estimate with very large confidence bounds extending to a negative value. As such, we estimated the abundance of CRITFC fish using the proportion method. Of all the White Sturgeon caught during the two sessions combined, 10.5% were CRITFC fish. Applying this proportion to the point estimate and across the CLs of the total overall population, gives a CRITFC abundance of 54 (CL from 39 to 68) fish.

5.4 Spatial Distribution of Catch

White Sturgeon were captured throughout much of the Rock Island Reservoir during both random and targeted samplings, though areas of sparsity or concentration persisted over both sessions (Figure 5-2). Catch was lower for both sessions in the relatively shallow areas around the mouth

of the Wenatchee River. The highest concentrations of catch during random sampling were in the lower third of the Rock Island Reservoir in deep water habitats. Targeted sampling had the highest densities of catch in the 2.2-mile (3.5 km) stretch below Rocky Reach Dam as well as two deep water areas in the lower Rock Island Reservoir and immediately upstream of the Rock Island forebay. The BRZ of both the Rocky Reach tailrace and Rock Island forebay were not fished.

The mean depth at which White Sturgeon were captured was 70 ft (21.4 m) (range= 17 to 190 ft [5.2 to 57.9 m]). The mean capture depth was 66.3 ft (20.2 m) for upstream hatchery supplementation immigrants (range= 17 to 190 ft [5.2 to 57.9 m]), 86 ft (26.2 m) for wild-origin fish (range= 20 to 190 ft [6.1 to 57.9 m]), and 97.4 ft (29.7 m) for CRITFC fish (range= 18 to 190 ft [5.5 to 57.9 m]). Analysis of variance (ANOVA) showed significant differences in capture depths among components ($F_{2,248} = 5.4$, $P = 0.005$). A post hoc Tukey test showed that the significant result was driven by the difference between supplementation immigrants and CRITFC groups ($P = 0.01$), whereas other pairwise combinations of origin groups did not differ significantly ($P > 0.05$). The depths of capture during Session One (mean = 68.9 ft [21.0 m]; range = 18 to 190 ft [5.5 to 57.9 m]) were not significantly different from those during Session Two (mean = 71.2 ft [21.7 m]; range = 17 to 170 ft ([5.2 to 51.8 m]; $F_{1,249} = 0.18$, $P = 0.67$). In randomized setline locations, fish were caught at a mean line depth of 63.6 ft (19.4 m) (range= 17 to 170 ft [5.2 to 51.8 m]), which did not differ significantly from fish caught in targeted fishing locations (mean = 72.2 ft [22.0 m]; range= 20 to 190 ft ([6.1 to 57.9 m]; $F_{1,249} = 1.59$, $P = 0.21$).



Note: The size of symbols is proportional to catch

Figure 5-2 Locations of Setlines with White Sturgeon Catch During Random and Targeted Fishing by Session

5.5 Size Structure

The 220 unique White Sturgeon captured ranged from 18.9 – 85.4 in. (48 – 217 cm) FL (mean = 39.8 in. [101 cm] FL) and in weight from 1.5 – 206.8 lbs (0.7 – 93.8 kg) (mean = 24.7 lbs [11.2 kg]). Overall, 92% of captured fish (n=203) were less than 63 in. (160 cm) FL (Figure 5-3). Wild-origin fish were observed throughout the size range (19.7 – 85.4 in. [50 – 217 cm] FL; mean = 43.7 in. [111 cm] FL, 41.0 lbs [18.6 kg]) of captured fish, whereas CRITFC fish tended toward larger sizes (range 53.5 – 76.4 in. [136 – 194 cm] FL; mean = 64.6 in. [164 cm] FL, 87.1 lbs [39.5 kg]). Upstream hatchery supplementation immigrants tended toward smaller sizes (range 18.9 – 60.2 in. (48 – 153 cm) FL; mean = 36.2 in. (92 cm) FL, 15.4 lbs ([7.0 kg]; Figure 5-4). Of the 17 fish that measured ≥63 in. (160 cm) FL, 14 were CRITFC fish and three were wild fish. ANOVA showed significant differences in lengths ($F_{2,217} = 74.1$, $P < 0.0001$) and weights ($F_{2,216} = 117.5$, $P < 0.0001$) among the origin types. Post hoc Tukey tests showed that all origin groups differed significantly from all other origin groups at the $\alpha = 0.05$ level in both length and weight. The W_r of captured fish ranged from 68% to 142% and averaged 92% (Figure 5-4). ANOVA suggested the presence of significant differences in W_r among the three origin groups ($F_{2,216} = 3.1$, $P = 0.049$), but the Tukey tests found no pairwise differences among them at the $\alpha = 0.05$ level.

Weight was not recorded for one wild-origin fish, hence, that fish was excluded from the weight and relative weight analyses.

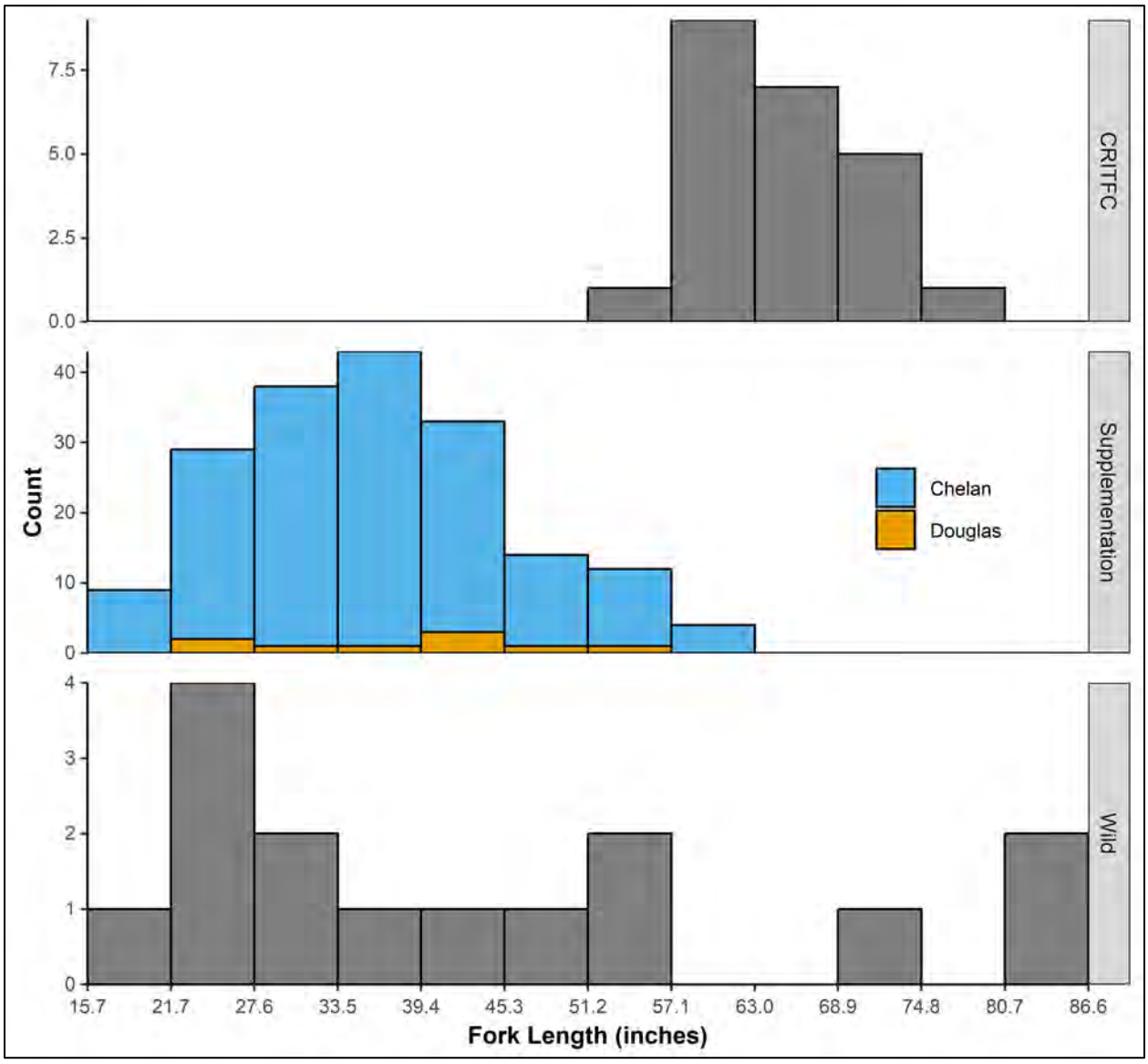


Figure 5-3 Distribution of White Sturgeon Fork Lengths by Origin

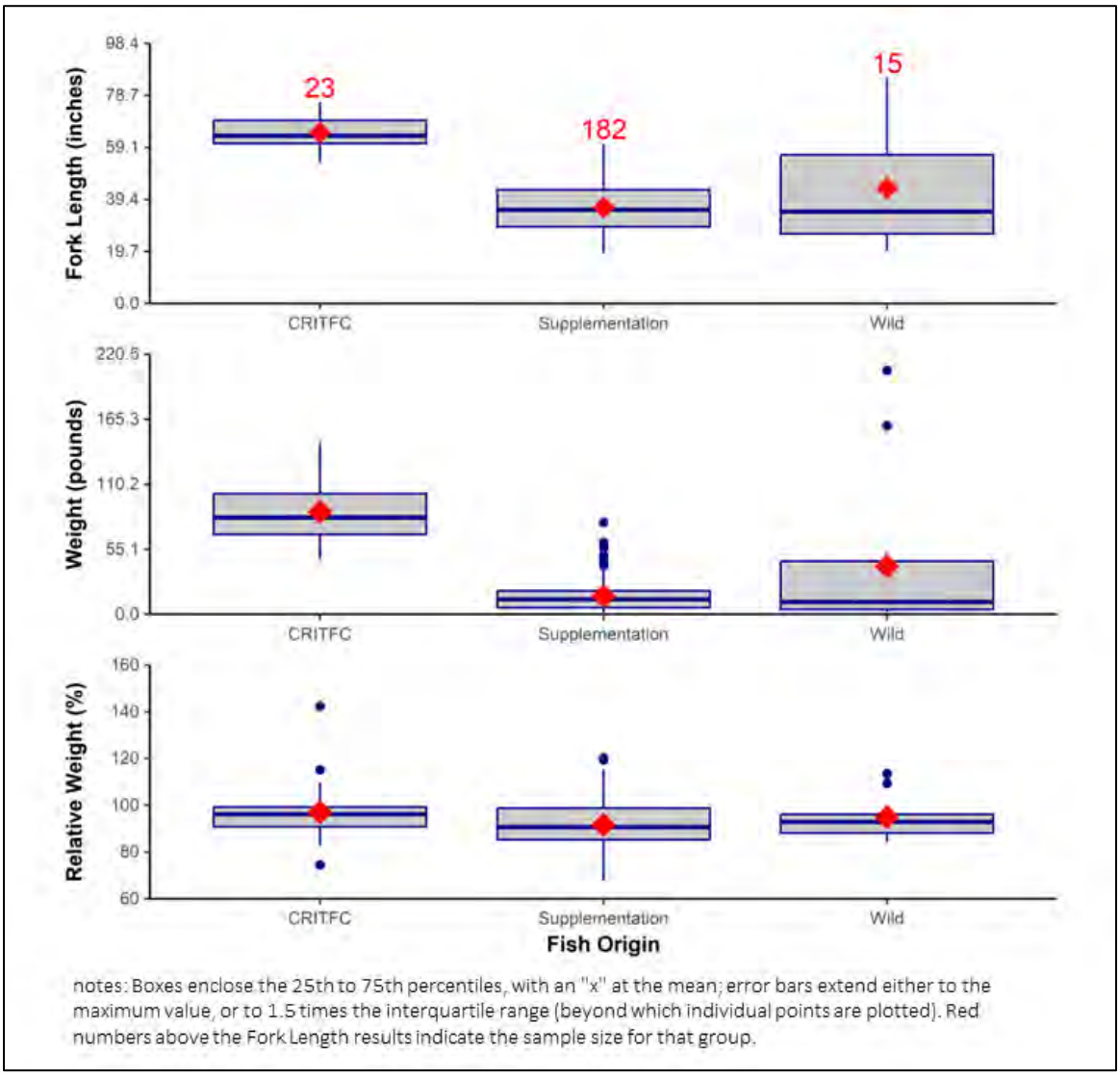


Figure 5-4 Fork Length, Weight, and Relative Weight by White Sturgeon Origin

5.6 Age Structure

Ages of hatchery-origin White Sturgeon are known since upstream hatchery supplementation immigrants to the Rock Island Reservoir were PIT tagged as yearlings prior to release (although five were of unknown age due to lost or damaged PIT tags following release), and all CRITFC-origin fish were from a single brood year (brood year 2002). The upstream hatchery-origin fish ranged from age-3 to age-12 with 72% being age-8 or older (Figure 5-5). All CRITFC hatchery-origin fish were age-20.

Of the wild-origin White Sturgeon caught, eight were under 39.4 in. (100 cm) FL (range 20.1 - 35.0 in. [51-89 cm] FL) and had fin ray samples collected and processed by the Colville Tribes' lab resulting in ages ranging from age-2 (2020 year class) to age-11 (2011 year class) (Table 5-3). The two independent readers agreed on the age of 75% of the samples (6 of 8). The two times they differed; it was a difference of one year. For Figure 5-5, the oldest age was displayed when readers differed. The remaining seven wild-origin White Sturgeon that were too large (>39.4 in. [100 cm] FL) to be aged accurately ranged from 43.3 - 85.4 in. (110-217 cm) FL. Details of the readers assessments and photographs of the samples can be seen in Appendix A.

Table 5-3 Aging Results of Wild White Sturgeon Fin Ray Samples by Reader

SAMPLE #	COLLECTION DATE	FORK LENGTH IN (CM)	READER	AGE	YEAR CLASS
1	8/4/2022	28.9 (73.5)	1	11	2011
			2	10	2012
2	8/4/2022	22.2 (56.5)	1	7	2015
			2	7	2015
3	8/6/2022	27.2 (69)	1	5	2017
			2	5	2017
4	8/6/2022	29.3 (74.5)	1	5	2017
			2	5	2017
5	8/13/2022	34.8 (88.5)	1	8	2014
			2	8	2014
6	8/13/2022	25.6 (65)	1	7	2015
			2	6	2016
7	10/18/2022	21.9 (55.5)	1	5	2017
			2	5	2017
8	11/1/2022	19.9 (50.5)	1	2	2020
			2	2	2020

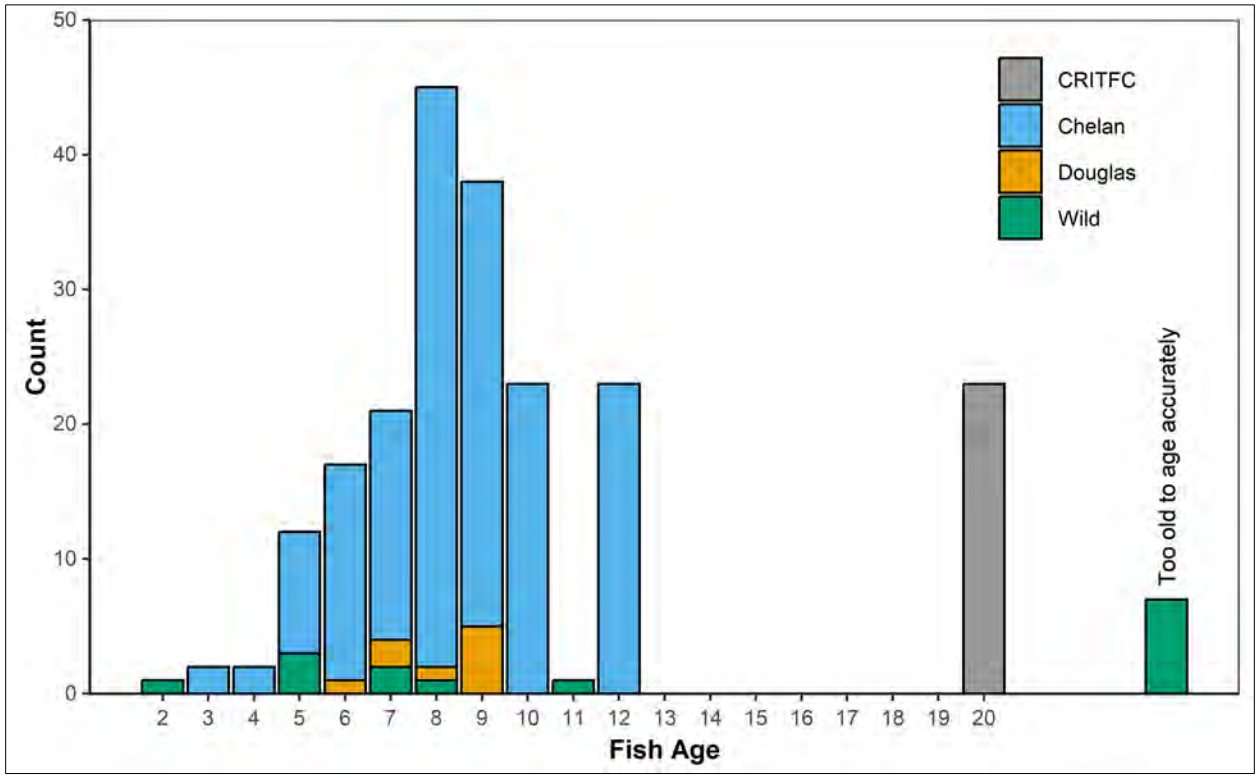


Figure 5-5 Distribution of White Sturgeon Ages (years) Captured During the Study, by Origin, for Known-age Fish

5.7 Sex and Maturity

The sex ratio of White Sturgeon sampled in the Rock Island Reservoir was 5:1 (20 males: 4 females; Table 5-4). There were only two upstream hatchery supplementation immigrants >150 cm, and both were females, one with developing oocytes (F3-4). CRITFC-origin fish had a sex ratio of 18:1 (18 males: 1 female; Table 5-4) and wild-origin fish had a ratio of 2:1 (2 males: 1 female; Table 5-4). Many CRITFC-origin fish were sexually mature and likely contributing to spawning events in the Rock Island Reservoir, with 14 of the males having completed spermatogenesis or actively spermiating. The single CRITFC female's abdominal cavity contained large 0.07 – 0.1 in. (2-3 mm) loose black eggs, indicating it will likely spawn in 2023.

Table 5-4 Sex and Stage of Maturity by Origin

ORIGIN	# OF JUVENILES (<59 IN. (150 CM))	FEMALE STAGES			FEMALE TOTALS	MALE STAGES		MALE TOTALS
		F1-2	F3-4	F5-6		M1-4,7	M5-6	
Chelan Hatchery	171	1	1	0	2	0	0	0
Douglas Hatchery	9	0	0	0	0	0	0	0
CRITFC	4	0	0	1	1	4	14	18
Wild	12	0	0	1	1	0	2	2
All Origins	196	1	1	2	4	4	16	20

5.8 Genetics

All White Sturgeon captured had DNA samples collected and processed by the CRITFC Hagerman Genetics Lab. Samples will be added to their genetics database allowing for future identification, as well as ongoing sturgeon population genetics work. Of the 15 wild-origin samples processed only two were full-siblings and there were no half-siblings (share one parent). The only other genetic relationship identified was between one 2015 year class wild-origin fish from this study and a wild-origin adult captured in Rocky Reach Reservoir in 2014 that are half-siblings.

6.0 CONCLUSION

6.1 Abundance

The abundance estimates for White Sturgeon in the Rock Island Reservoir were based on a dataset including small numbers of marked fish and recaptures. For one population component, CRITFC fish, there were no fish recaptured in either fishing session, resulting in an estimate (using the Peterson estimator) with very large confidence bounds. For the wild-origin fish component, for which two fish were recaptured, the CLs were questionable. The CL for wild-origin fish extended from 9 to 49, but the raw data showed that 15 individual wild-origin fish were encountered in 2022, indicating that the lower CL of nine fish in this analysis is an underestimate. This also calls into question the validity of the upper CL, which is likely overestimated. When using the Petersen equation, tighter confidence bounds are produced when the number of fish examined in Session Two is high (there are diminishing returns at relatively high sample sizes, but for wild-origin fish, it was n=8), or when the marked proportion of the population tends toward either 0% or 100% (for wild-origin fish, it was 25%). Despite wide confidence bounds, the abundance estimates produced by this analysis appear to meet relicensing information needs.

When comparing the estimated Rock Island Reservoir wild-origin abundance of 29 White Sturgeon (9 to 49, 95% CL) to the wild-origin population abundance estimates in adjacent reservoirs, it is relatively similar to what has been observed, especially when reservoir size is considered. For instance, the pre-supplementation wild-origin abundance was estimated at 134 (48-2,680) fish in the Priest Rapids Reservoir, 551 fish (314-1,460) in the Wanapum Reservoir (Golder 2003), 75 (38-151) in the Rocky Reach Reservoir (Wright et al. 2015), and 31 (13-218) fish in the Wells Reservoir (Jerold, 2007).

6.2 Catch Rates

The overall CPUE for the Rock Island Reservoir was 1.13 fish per setline and was comprised predominantly of Chelan PUD hatchery-origin fish (which accounted for 0.91 fish per setline). The capture gear used was larger-sized (“adult”) setlines that targeted the entire population (see Robichaud et al. in prep for details). The Rock Island Reservoir has not been stocked by a Chelan PUD-led hatchery supplementation program, thus all the supplementation fish encountered were immigrants from upstream reservoirs. Comparing catch rates to other reservoirs is made complicated by the gear types used and the amount of supplementation that had occurred at the time of sampling. For example, CPUE of smaller-sized (“juvenile-targeting”) indexing setlines in the Rocky Reach Reservoir ranged from 3.8 to 4.7 sturgeon per setline from 2016 to 2020 (Robichaud et al. 2021) after 11 years of supplementation, but was only 1.4 fish per setline in 2013 (the first year of indexed setlining), when there had been only three years of supplementation (Robichaud

et al. 2014) – a rate more comparable to that observed in the present study. CPUE in the Wells Reservoir was 0.95 fish per setline (juvenile-targeted gear) after two years of supplementation (Robichaud and Gingerich 2016) and was 1.0 fish per line in 2021 (Robichaud and Gingerich 2022). CPUE of adult-targeted setlining gear was 1.4 and 2.1 fish per setline in Wells and Rocky Reach reservoirs in 2021, respectively (Robichaud and Gingerich 2022, Robichaud et al. in prep.).

The overall CPUE for wild-origin White Sturgeon in the Rock Island Reservoir was 0.08 fish per setline. This was a relatively low catch rate but was nevertheless double what was observed (0.04 fish per setline) during the 1998 WDFW survey (the only other reported CPUE in Rock Island Reservoir; DeVore et al. 2000). The increase in CPUE was likely related to recent recruitment of younger wild fish: the mean size in the WDFW survey was 66.9 in. (170 cm) FL, as compared to 43.7 in. (111 cm) FL in the present study. Catch rates of wild-origin fish were lower in the present study, as compared to those in adjacent reservoirs in years prior to hatchery supplementation (i.e., before 2011). Wild-origin CPUE in the Wanapum Reservoir was 0.20 fish per setline from 1999-2002 (Golder 2003), while in the Rocky Reach Reservoir, the CPUE was 0.19 during the 2001 and 2002 studies (Golder 2002). Differences in reservoir size and/or types and availability of habitats could explain differences in catch rates, although all these wild-origin catch rates are at levels that suggest small population densities.

6.3 Size and Age Structure

The different origin groups displayed significant differences in length and age. The CRITFC fish were all age-20 fish (brood year 2002, released during 2003) and were therefore expected to be of relatively large size. Fish that immigrated from upstream hatchery supplementation programs (programs began with releases in 2011 and have continued annually) ranged from age-3 to age-12, and were, as expected, smaller than the age-20 CRITFC fish. Wild-origin fish were comprised of mostly younger fish (i.e., < 59.0 in. [150 cm FL]), but also included three larger adults (>72.4 in. [184 cm]), thus spanning through the juvenile and adult size ranges. The high proportion of younger White Sturgeon in the wild-origin catch suggested that successful recruitment events have occurred in the last decade, either directly in the Rock Island Reservoir or upstream (i.e., wild immigrants into the Rock Island Reservoir). There seems to have been some level of recruitment in many recent years, with year classes from at least five different years since 2011, rather than fewer distinct recruitment pulses during higher flow years as found in other reservoirs. Despite the unique recruitment timelines and sizes of origin groups, the relative weights were similar among groups. The average relative weight in the Rock Island Reservoir (92%) is in line with observations from sampling upstream in the Rocky Reach Reservoir (Robichaud et al. in prep.).

6.4 Sex and Maturity

The heavily male-skewed sex ratios found in the Rock Island Reservoir are unexpected. Findings in the Rocky Reach Reservoir (Golder 2002), Priest Rapids Project (Golder 2003), and downstream of Bonneville Dam (DeVore et al. 1995) all had sex ratios much closer to 1:1. It is possible that earlier-staged female's gonadal adipose tissue was miscategorized as male gonadal tissue, however field crews were experienced in observing developing ovigerous folds and developing oocytes in females. Further, once a skewed sex ratio was detected in the field, extra scrutiny was given to observations and assignments.

Both male and female CRITFC-origin White Sturgeon in the Rock Island Reservoir were confirmed to be sexually mature and have the potential to contribute to spawning events. Recently WDFW has decided, based on low genetic diversity, to remove CRITFC-origin sturgeon from the Priest Rapids Project, and may similarly elect to open a future fishery to remove them from the Rock Island Reservoir (L. Keller, Chelan PUD, personal communication, January 13, 2023).

6.5 Genetics

The limited genetic relationships identified between the wild-origin White Sturgeon captured indicate there are enough wild-origin fish spawning successfully within or upstream of the Rock Island Reservoir to have 13 of the 15 wild-origin fish in this study be genetically unrelated. The half-sibling relationship identified between a wild-origin adult captured in Rocky Reach in 2014 (219 cm FL) and a 2015 year-class (57 cm FL) White Sturgeon from this study suggests a successful spawning event in the Rocky Reach or Rock Island Reservoir in 2015. The Hagerman Lab has a well-constructed population assignment to Lake Roosevelt origin White Sturgeon, so dispersal from Lake Roosevelt can likely be ruled out.

Wild-origin White Sturgeon captured from the Rock Island Reservoir did not have any confirmed genetic relationship to CRITFC-origin White Sturgeon at this time. However, the parentage of the CRITFC-origin fish is incomplete and a reconstruction from available samples is ongoing through the CRITFC Hagerman Genetics Lab. As such, the possibility of CRITFC-origin contribution to Rock Island Reservoir spawning events in the past or future still exists.

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APPENDIX A Details of Aging Results from Fin Ray Analysis

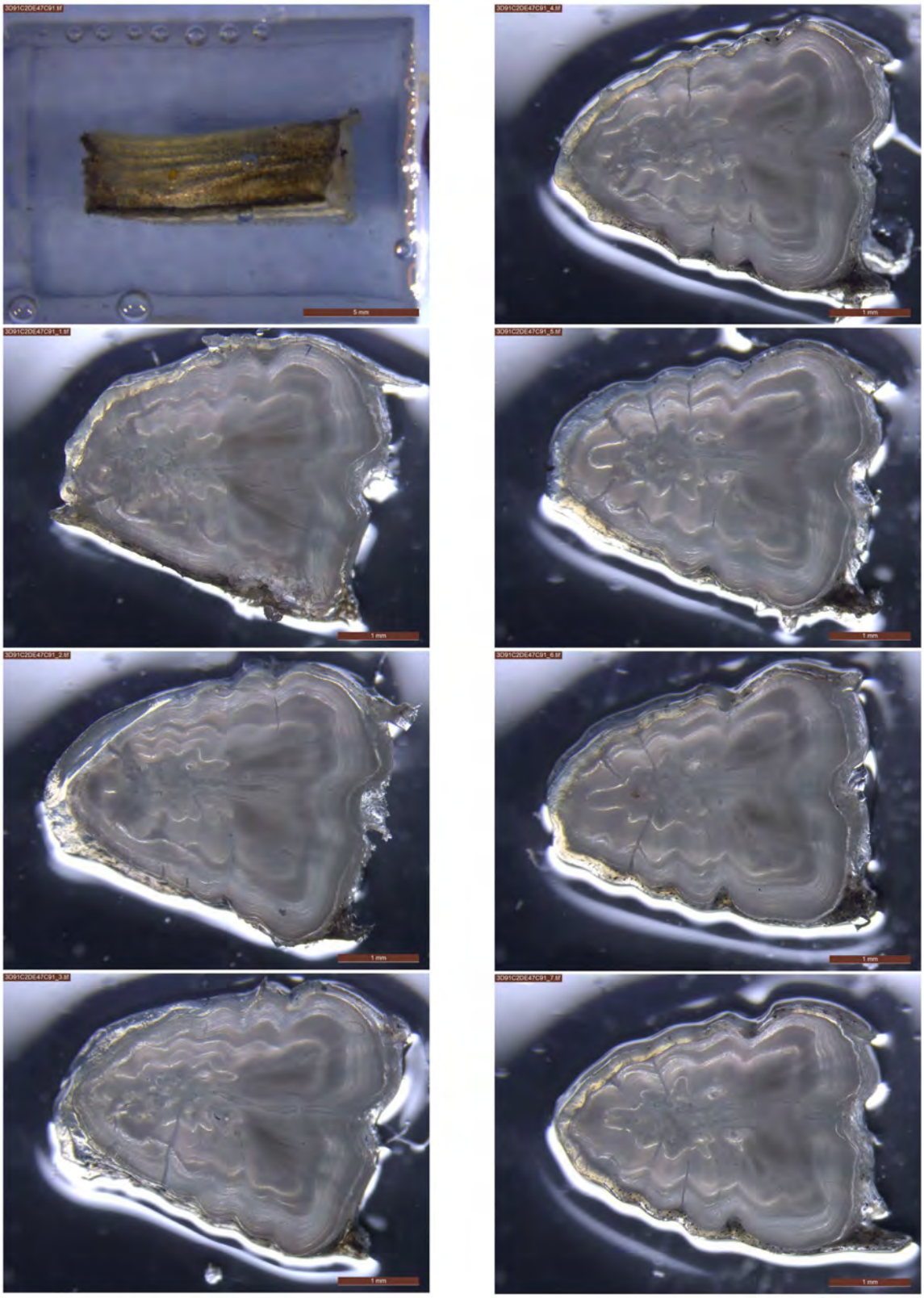
Reader results including comments from aging fin ray samples and photographs of the fin ray sections used to determine age are shown in Table A- 1. Chelan PUD and Blue Leaf Environmental would like to acknowledge and thank CTCR for processing and analyzing the fin ray samples.

Table A- 1 Details from Aging of the Fin Ray Samples by Readers One and Two

PIT#	COLLECTION DATE	FORK LENGTH IN. (CM)	READER	AGE	YEAR CLASS	READER COMMENTS
3D9.1C2DECCF5C	8/4/2022	28.7 (73.5)	1	11	2011	Difficult sample to age. First annulus is indistinct suggesting sample was perhaps taken too far from fin articulation. Annulus spacing suggests steady growth until age 5 after which growth checks become smeared and crowded indicating slow growth.
			2	10	2012	Low confidence, closely spaced, relatively indistinct outer (5-10) annuli make it difficult to estimate.
3D9.1C2DF16F7E	8/4/2022	22.2 (56.5)	1	7	2015	The first annulus is visible but very small. Outer annuli somewhat smeared and crowded.
			2	7	2015	Low confidence, closely spaced, relatively indistinct annuli after the first make it difficult to estimate.
3D9.1C2DF15CBC	8/6/2022	27.2 (69)	1	5	2017	First annulus is visible in several thin sections. Good sample.
			2	5	2017	distinct annuli
3D9.1C2DF17B4A	8/6/2022	29.3 (74.5)	1	5	2017	First annulus is visible in several thin sections. Good sample.
			2	5	2017	
3D9.1C2DF19A6C	8/13/2022	34.8 (88.5)	1	8	2014	First annulus is visible in several thin sections. Good sample.
			2	8	2014	

PIT#	COLLECTION DATE	FORK LENGTH IN. (CM)	READER	AGE	YEAR CLASS	READER COMMENTS
3D9.1C2DE47C91	8/13/2022	25.6 (65)	1	7	2015	First annulus is visible but the smeared and crowded outer annuli make age interpretation difficult.
			2	6	2016	Low confidence, closely spaced, relatively indistinct 3rd, 4th, and 5th annuli make it difficult to estimate.
3D9.1C2DECC096	10/18/2022	21.9 (55.5)	1	5	2017	First annulus is visible.
			2	5	2017	distinct annuli
3D9.1C2DF1858F	11/1/2022	19.9 (50.5)	1	2	2020	First annulus is visible in several thin sections. Good sample.
			2	2	2020	

RESERVOIR: Rock Island **PIT# 3D91C2DE47C91** **COLLECTION DATE: 08/13/2022**



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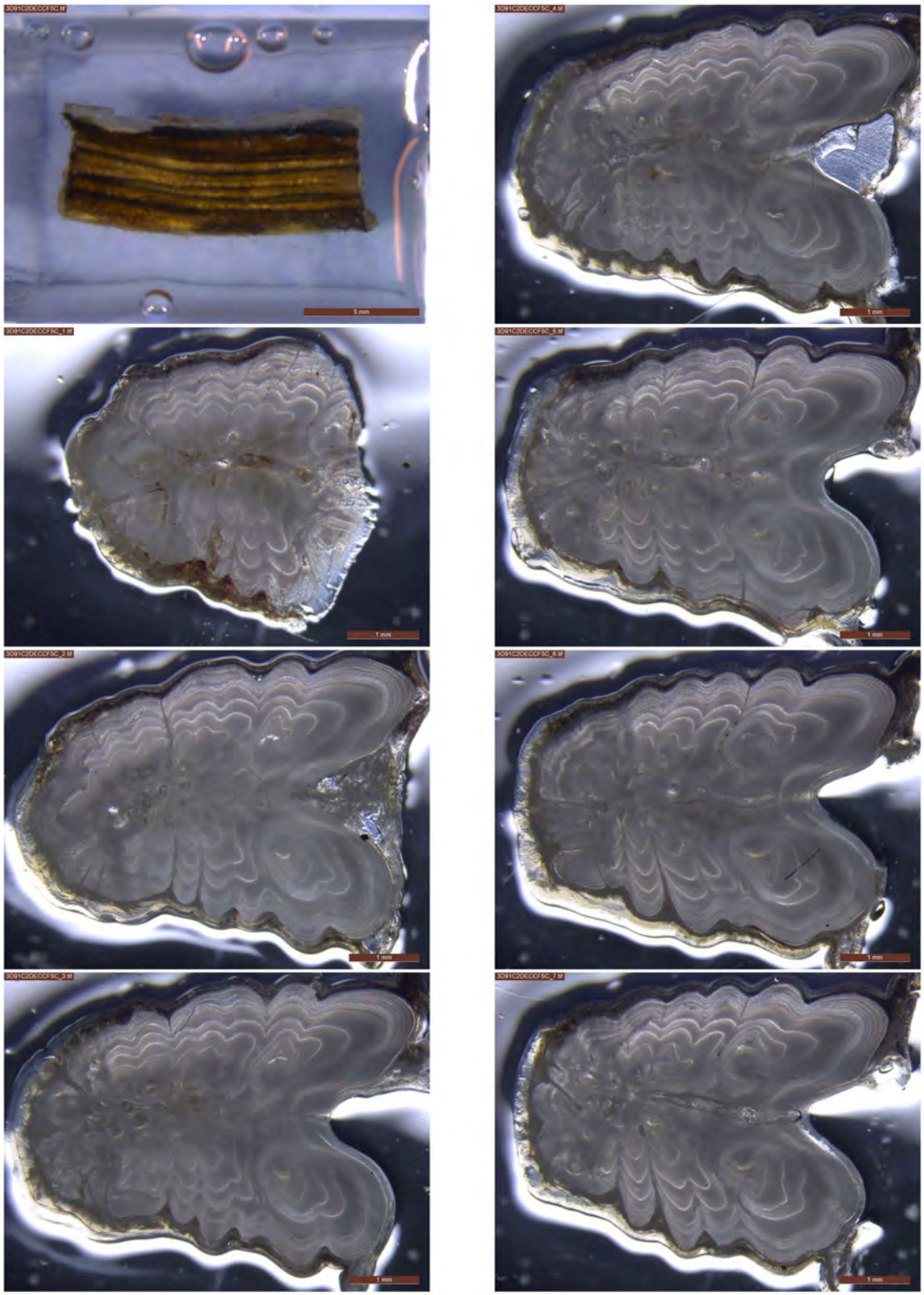

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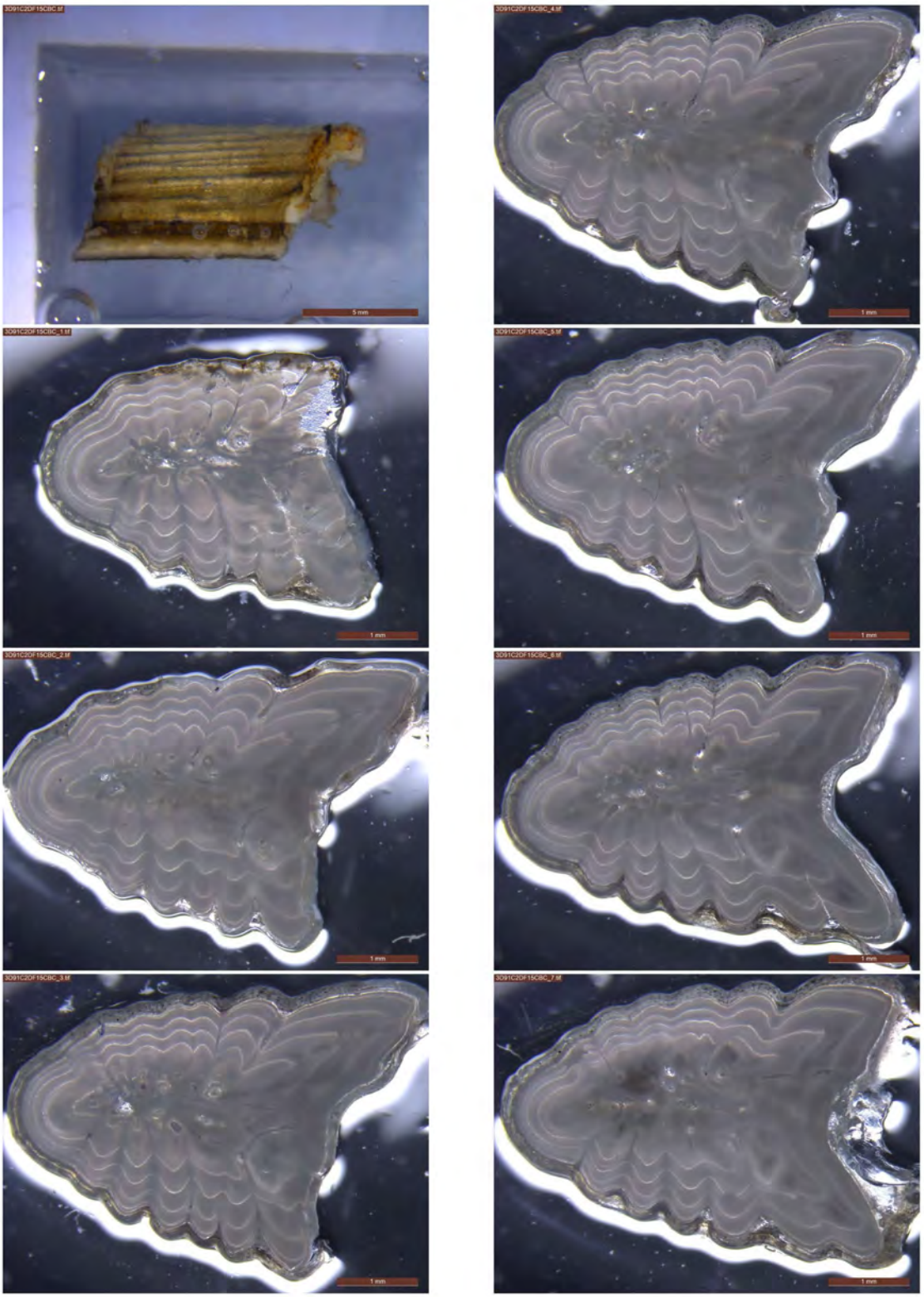

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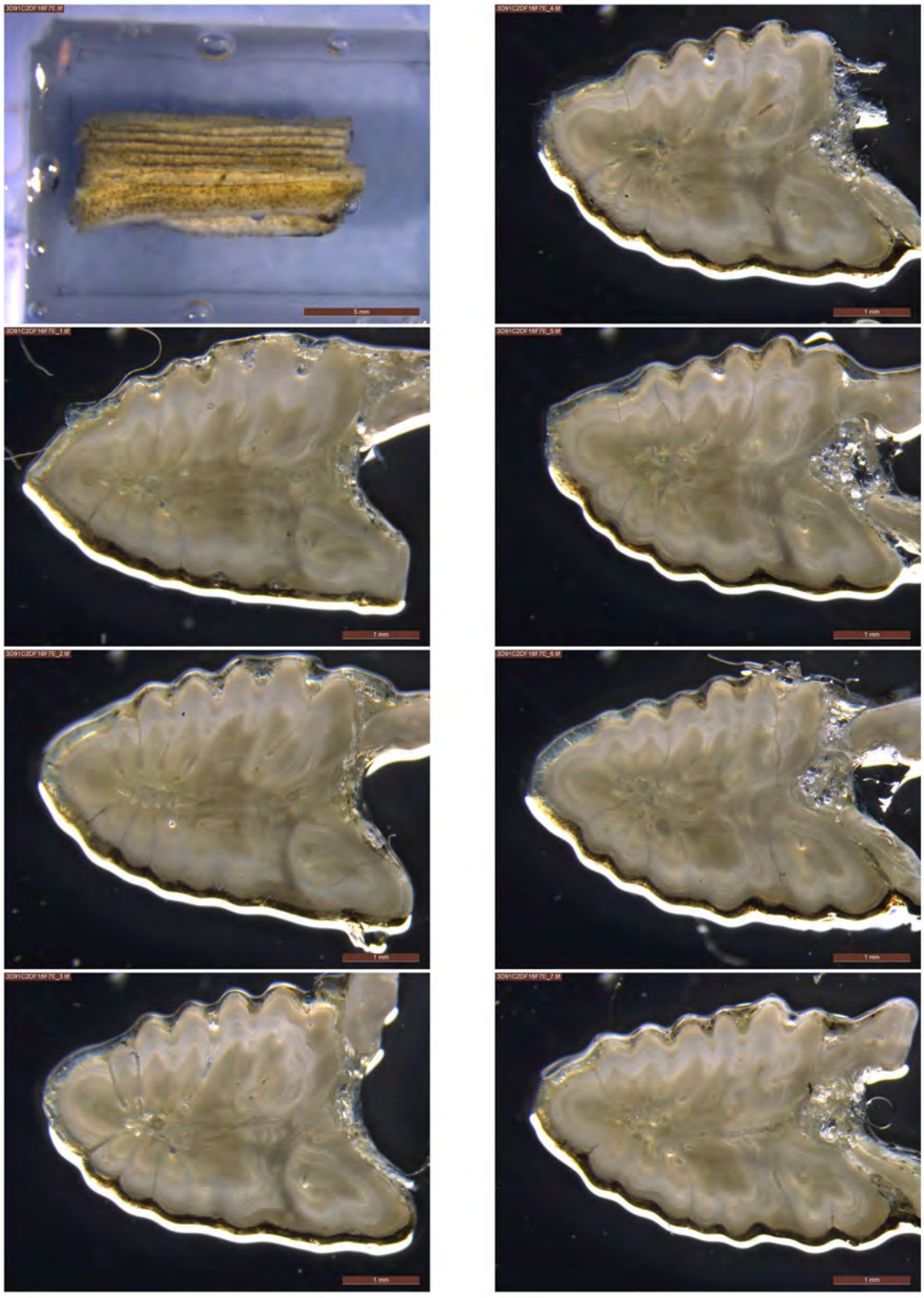

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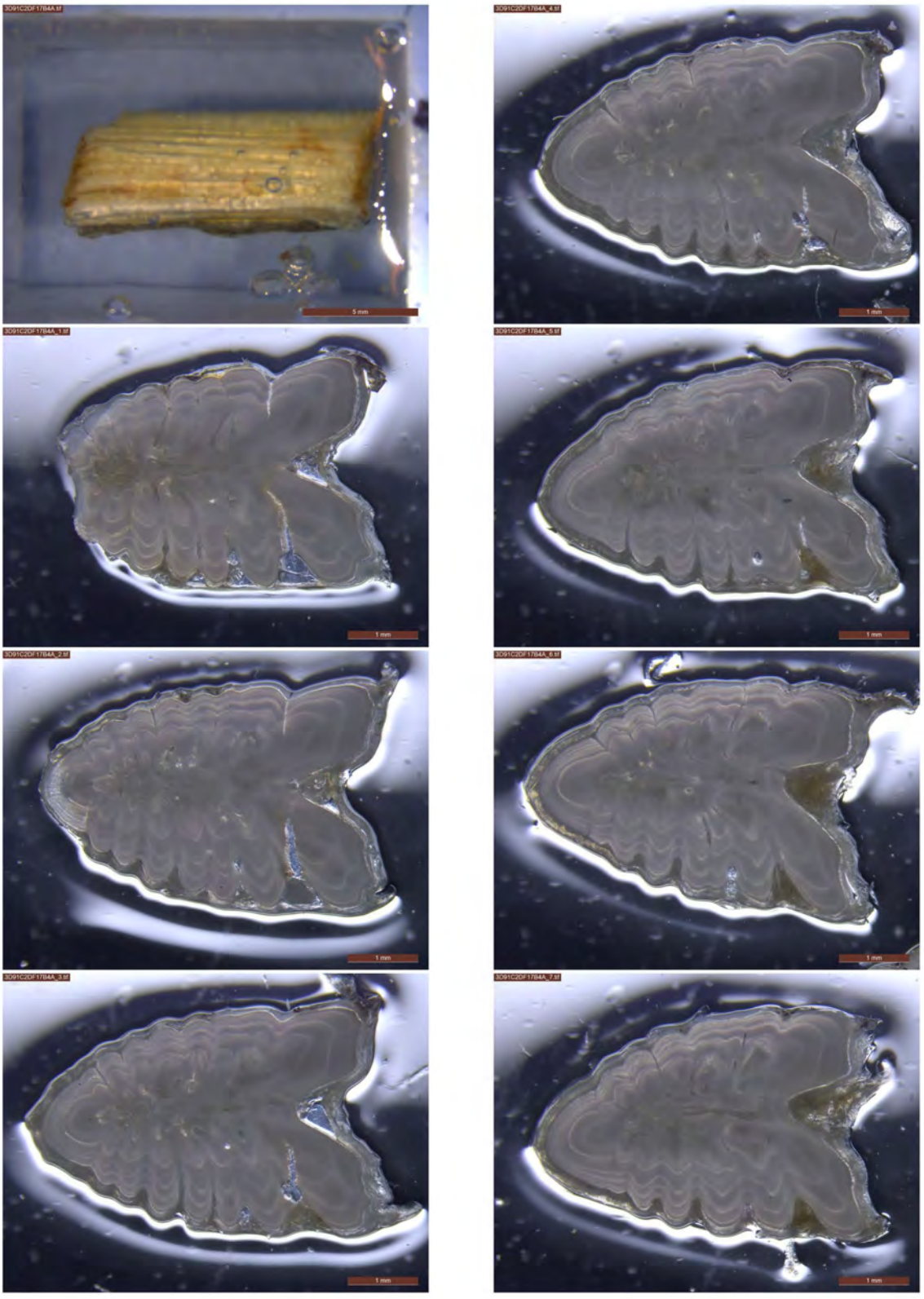

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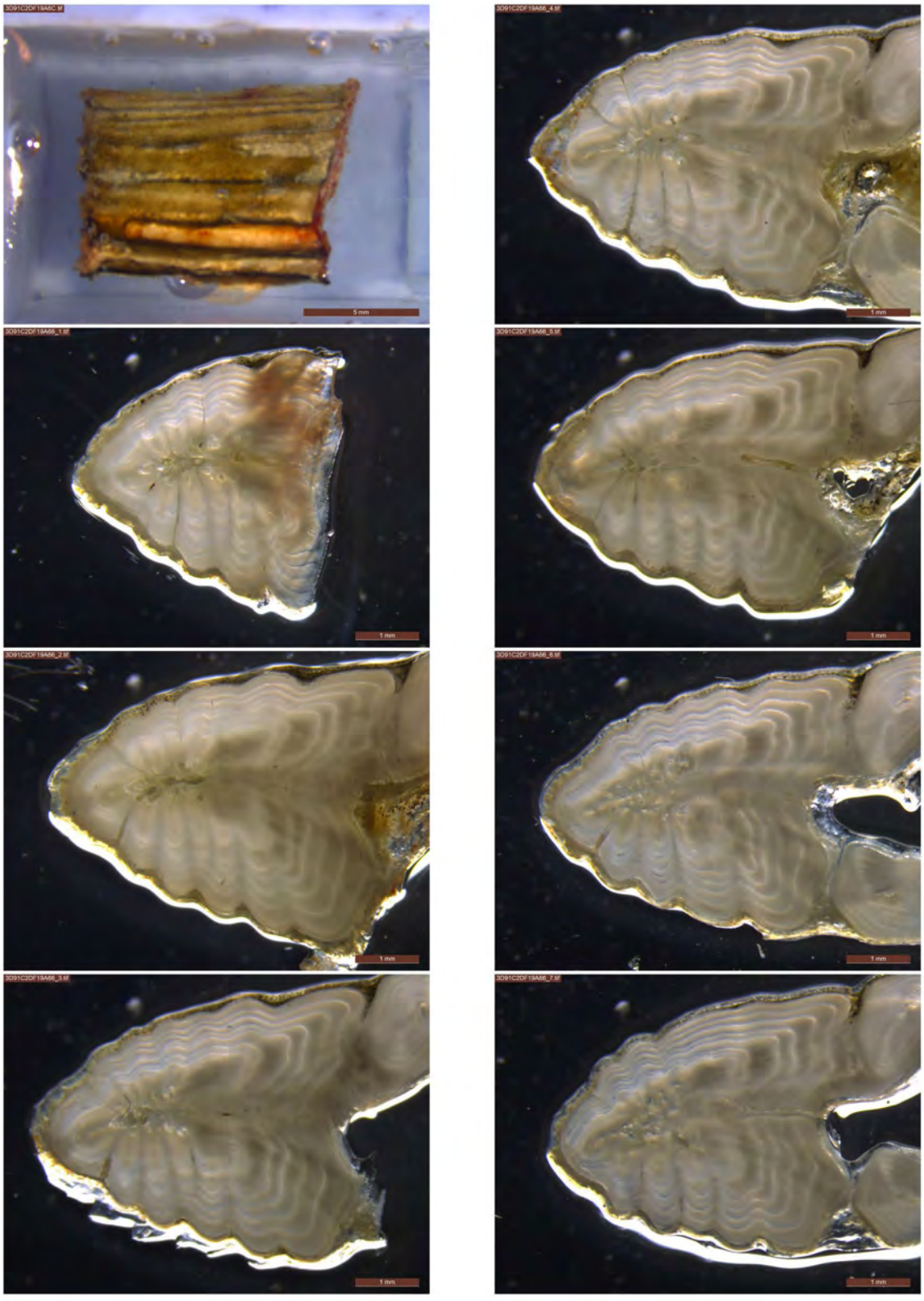

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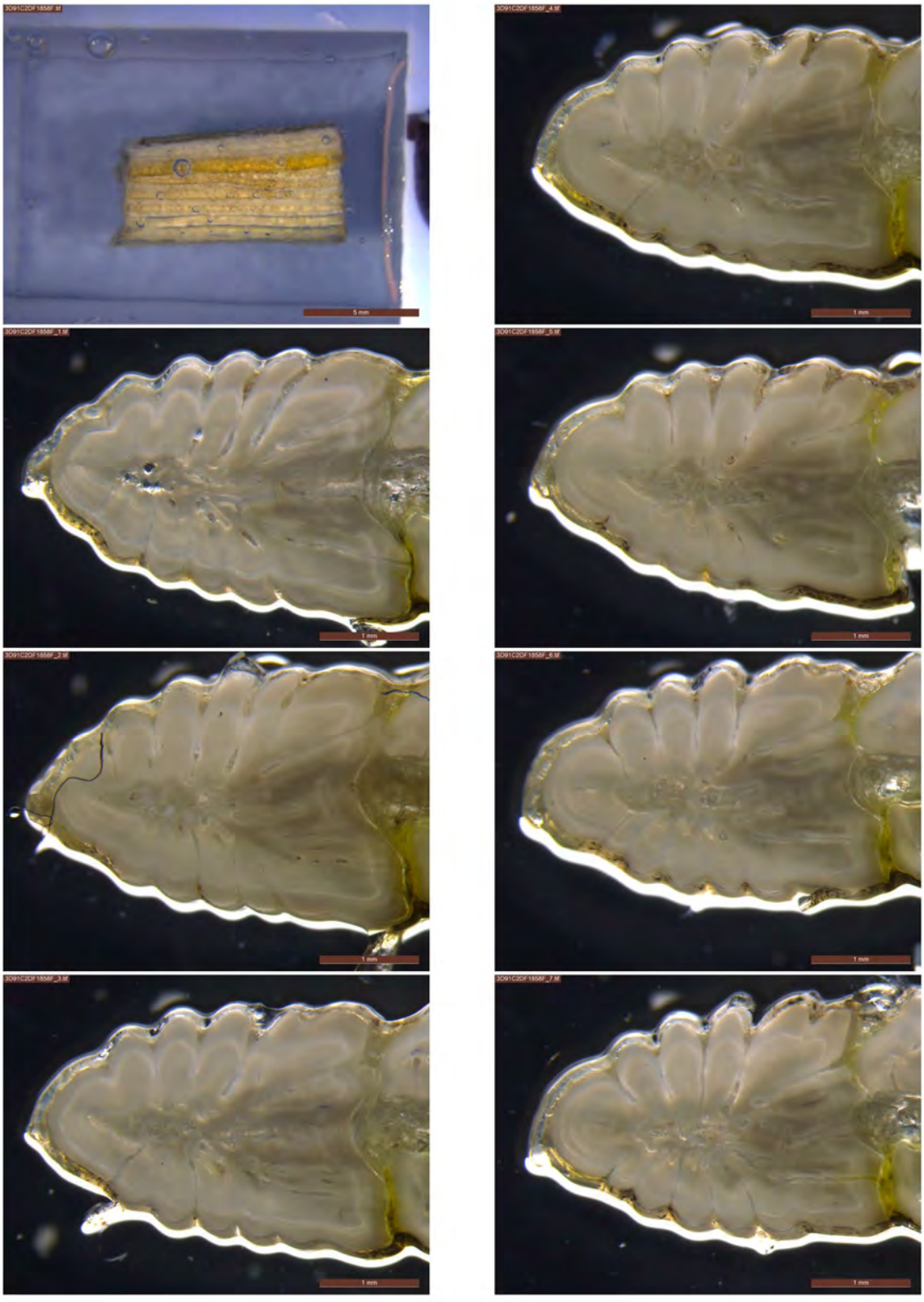

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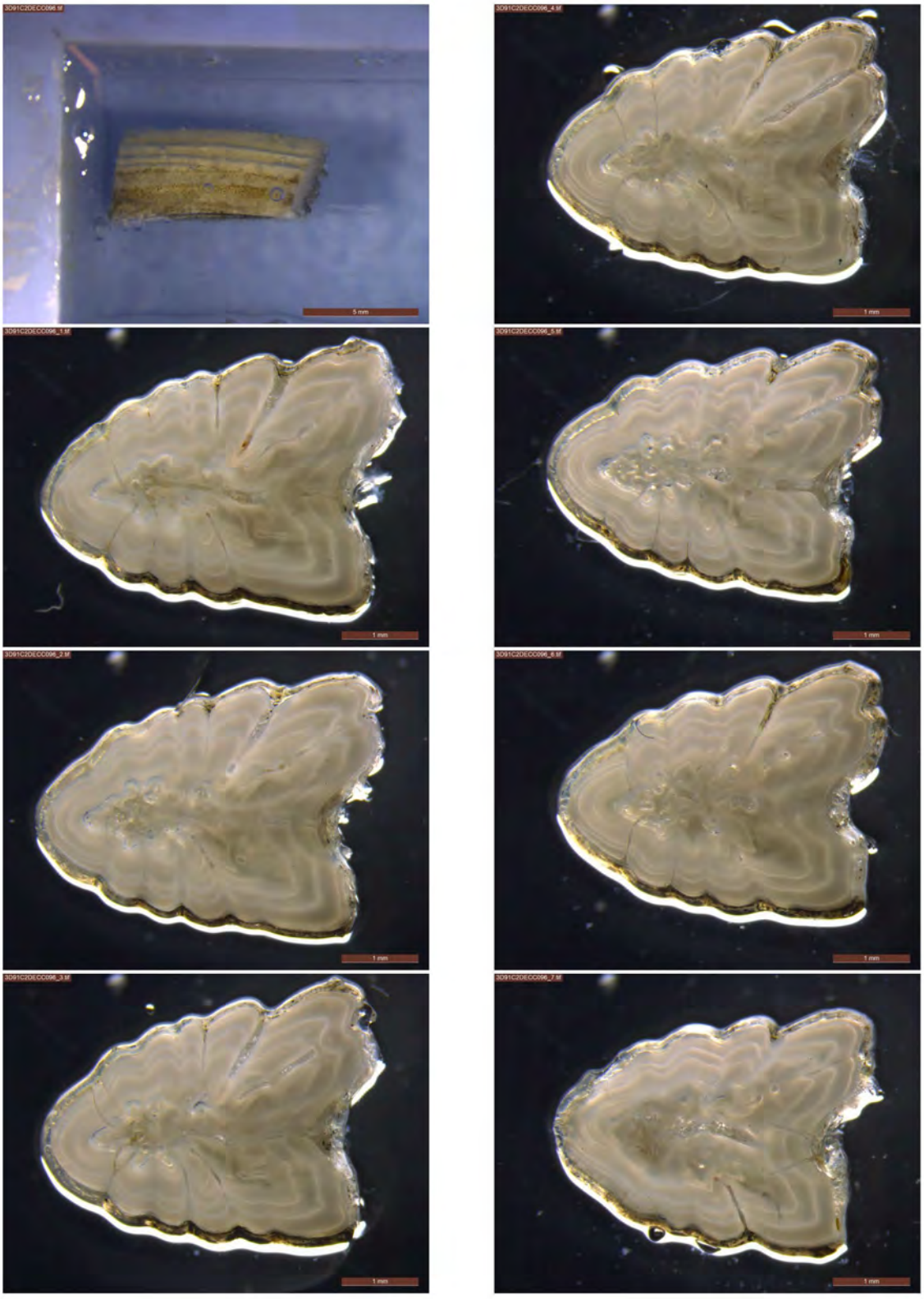

APPENDIX B Consultation Record

Chelan PUD distributed the draft White Sturgeon Population Indexing Study Report to the Fish and Aquatics Technical Working Group White Sturgeon Subteam (Subteam) via email on April 3, 2023 for review prior to meeting with the Subteam on April 11, 2023 to discuss the draft study report. Input from the Subteam was incorporated into the draft study report following the meeting.

Chelan PUD then submitted the updated draft White Sturgeon Population Indexing Study Report to the Fish and Aquatic Technical Working Group (TWG) (see Table B- 1) via email on July 12, 2023 for a 10-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. No comments were submitted during the comment period.

Table B- 1 Organization Names and Fish and Aquatic TWG Member Names

ORGANIZATION	NAME
American Rivers	Bridget Moran
Audubon Society	Mark Johnston
Blue Leaf	Corey Wright
Blue Leaf	Dave Robichaud
Bureau of Indian Affairs (BIA)	Harold Peterson
BIA	Keith Hatch
BIA	Steve Lewis
Cascade Fisheries	Jason Lundgren
Chelan County	Julie Sanderson
Chelan County PUD (Chelan PUD)	Alene Underwood
Chelan PUD	Ben Truscott
Chelan PUD	Brian Odell
Chelan PUD	Catherine Willard
Chelan PUD	Janel Ulrich
Chelan PUD	Kate Taylor
Chelan PUD	Lance Keller
Chelan PUD	Laura Clark
Chelan PUD	Peter Vanney
Chelan PUD	RIRelicensing
Chelan PUD	Scott Hopkins
Chelan PUD	William Towey
City of Rock Island	Brock Laughlin
Columbia River Inter-Tribal Fish Commission (CRITFC)	Blaine Parker
CRITFC	Diane Barton
CRITFC	Julie Carter
CRITFC	Donella Miller

ORGANIZATION	NAME
CRITFC	Lauri Porter
CRITFC	Tom Skiles
Confederated Tribes and Bands of the Yakama Nation (Yakama Nation)	Brandon Rogers
Yakama Nation	David Blodgett
Yakama Nation	Elaine Harvey
Yakama Nation	Tom Iverson
Yakama Nation	Ralph Lampman
Yakama Nation	Keely Murdoch
Confederated Tribes of the Colville Reservation (CTCR)	Bret Nine
CTCR	Casey Baldwin
CTCR	Jason McLellan
CTCR	Kirk Truscott
CTCR	Renata Rollins
Confederated Tribes of the Umatilla Indian Reservation	Aaron Jackson
Confederated Tribes of the Umatilla Indian Reservation	Audie Huber
Confederated Tribes of the Umatilla Indian Reservation	Brent Hall
Confederated Tribes of the Umatilla Indian Reservation	Carl Merkle
Confluence Environmental Company	Eric Doyle
Environmental Assessment Services	Matt Paulsen
Four Peaks	Joe Miller
Four Peaks	Leah Nagel
Four Peaks	Pradeep Mugunthan
Golder Associates	Paul Grutter
Individual	Derek Stuart
Individual	Steve Hays
Kearns & West	Angela Hessenius
Kearns & West	Jim Downing
Kearns & West	Katy Kennedy
Kearns & West	Kelsey Rugani
Kearns & West	Mary Beth Day
Kleinschmidt Associates	Audrey Thompson
Kleinschmidt Associates	Jeff Deason
Kleinschmidt Associates	Kai Steimle

ORGANIZATION	NAME
Kleinschmidt Associates	MaryLouise Keefe
Kleinschmidt Associates	Nathalie Denis
National Oceanic and Atmospheric and Administration (NOAA)	Justin Yeager
NOAA	Scott Carlon
Northwest Power and Conservation Council (NPCC)	Sara Mounts
NPCC	Stacy Horton
Upper Columbia River Salmon Recovery Board	Tracy Bowerman
US Bureau of Reclamation (USBR)	Gina Hoff
USBR	Shannon Archuleta
US Fish and Wildlife Service (USFWS)	Jason Romine
USFWS	Jerrmaine Treadwell
USFWS	Judy Neibauer
USFWS	Kenneth Muir
USFWS	R.D. Nelle
USFWS	Sonja Kokos
USFWS	Tara Callaway
USFWS	William Gale
WA Department of Natural Resources (WADNR)	Cindy Preston
WADNR	James Huinker
WA Parks	Andrew Fielding
WA Parks	Chelsea Harris
Washington Department of Ecology (Ecology)	Breean Zimmerman
Ecology	Kalman Bugica
Ecology	Mark Peterschmidt
Ecology	Tyson Oreiro
Washington Department of Fish and Wildlife (WDFW)	Andrew Murdoch
WDFW	Benjamin Blank
WDFW	Chad Jackson
WDFW	Dave Burgess
WDFW	Laura Heironimus
WDFW	Patrick Verhey

From: RIRelicensing
To: "aaronjackson@ctuir.org"; "AHessenius@kearnswest.com"; Alene Underwood; "andrew.fielding@parks.wa.gov"; "Andrew.Murdoch@dfw.wa.gov"; "AudieHuber@ctuir.org"; "Audrey.Thompson@kleinschmidtgroup.com"; "bard@critfc.org"; Ben Truscott; "Benjamin.Blank@dfw.wa.gov"; "bladescodeservices@yahoo.com"; "blod@yakamafish-nsn.gov"; "bmoran@americanrivers.org"; "brenthall@ctuir.org"; "bret.nine@colvilletribes.com"; Brian Odell; "bzim461@ecy.wa.gov"; "carj@critfc.org"; "CarlMerkle@ctuir.org"; "Casey.Baldwin@colvilletribes.com"; Catherine Willard; "chad.jackson@dfw.wa.gov"; "Chelsea.Harris@parks.wa.gov"; "cindy.preston@dnr.wa.gov"; "cwright@lgl.com"; "dave.burgess@dfw.wa.gov"; "dmiller@critfc.org"; "drobichaud@lgl.com"; "DStuart@nhcweb.com"; "eric.doyle@confenv.com"; "ghoff@usbr.gov"; "hare@yakamafish-nsn.gov"; "Harold.Peterson@bia.gov"; "ivet@yakamafish-nsn.gov"; "James.Huinker@dnr.wa.gov"; Janel Ulrich; "jason.mclellan@colvilletribes.com"; "jason@ccfeg.org"; "jason_romine@fws.gov"; "jdowning@kearnswest.com"; "jeff.deason@kleinschmidtgroup.com"; "jerrmaine_treadwell@fws.gov"; "jmiller@fourpeaksenv.com"; "judy_neibauer@fws.gov"; "julie.sanderson@co.chelan.wa.us"; "justin.yeager@noaa.gov"; "kai.steimle@kleinschmidtgroup.com"; "kalman.bugica@ecy.wa.gov"; Kate Taylor; "keith.hatch@indianaffairs.gov"; "kenneth_muir@fws.gov"; "kirk.truscott@colvilletribes.com"; "kkennedy@kearnswest.com"; "krugani@kearnswest.com"; "lamr@yakamafish-nsn.gov"; Lance Keller; Laura Clark; "laura.heironimus@dfw.wa.gov"; "lnagel@fourpeaksenv.com"; "mape461@ecy.wa.gov"; "marylouise.keefe@kleinschmidtgroup.com"; "matt.paulsen@komanholdings.com"; "mbday@kearnswest.com"; "murk@yakamafish-nsn.gov"; "Nathalie.Denis@Kleinschmidtgroup.com"; "parb@critfc.org"; "Patrick.Verhey@dfw.wa.gov"; "Paul_Grutter@golder.com"; Peter Vanney; "pmugunthan@fourpeaksenv.com"; "porl@critfc.org"; "RD_Nelle@fws.gov"; "renata.rollins.env@colvilletribes.com"; "rogb@yakamafish-nsn.gov"; "sarchuleta@usbr.gov"; "scott.carlon@noaa.gov"; Scott Hopkins; "sghays51@msn.com"; "shorton@nwcouncil.org"; "skit@critfc.org"; "SMounts@NWCouncil.org"; "Sonja_Kokos@fws.gov"; "stephen.lewis@bia.gov"; "tara_callaway@fws.gov"; "tore461@ecy.wa.gov"; "toxostoma495@gmail.com"; "tracy.bowerman@ucsrb.org"; Bill Towey; "william_gale@fws.gov"; RIRelicensing
Subject: RE: RI Relicensing White Sturgeon Population Index Study Report - Comment Opportunity
Date: Wednesday, July 19, 2023 8:01:55 AM
Attachments: image001.png

Good morning,

This is a reminder that comments on the White Sturgeon Population Index Study Report are due by **end of day next Wednesday, July 26.**
Click the link to access the document and submit your comments. Again, if you have no comments after your review, we appreciate the submission through the Smart Comment platform of "no comment" as that is helpful for the consultation record.

Thank you,

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Wednesday, July 12, 2023 9:02 AM
To: 'aaronjackson@ctuir.org' <aaronjackson@ctuir.org>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; Alene Underwood <Alene.Underwood@chelanpud.org>; 'andrew.fielding@parks.wa.gov' <andrew.fielding@parks.wa.gov>; 'Andrew.Murdoch@dfw.wa.gov' <Andrew.Murdoch@dfw.wa.gov>; 'AudieHuber@ctuir.org' <AudieHuber@ctuir.org>; 'Audrey.Thompson@kleinschmidtgroup.com' <Audrey.Thompson@kleinschmidtgroup.com>; 'bard@critfc.org' <bard@critfc.org>; Ben Truscott <Ben.Truscott@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'blod@yakamafish-nsn.gov' <blod@yakamafish-nsn.gov>; 'bmoran@americanrivers.org' <bmoran@americanrivers.org>; 'brenthall@ctuir.org' <brenthall@ctuir.org>; 'bret.nine@colvilletribes.com' <bret.nine@colvilletribes.com>; Brian Odell <brian.odell@chelanpud.org>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'carj@critfc.org'

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'tara_callaway@fws.gov' <tara_callaway@fws.gov>; 'tore461@ecy.wa.gov' <tore461@ecy.wa.gov>; 'toxostoma495@gmail.com' <toxostoma495@gmail.com>; 'tracy.bowerman@ucsrb.org' <tracy.bowerman@ucsrb.org>; Bill Towey <bill.towey@chelanpud.org>; 'william_gale@fws.gov' <william_gale@fws.gov>
Subject: RI Relicensing White Sturgeon Population Index Study Report - Comment Opportunity

Good morning,

Here is the link to comment on the White Sturgeon Population Index Study Report. Click the link to access the document and submit your comments.
If you have no comments after your review, we appreciate the submission through the Smart Comment platform of "no comment" as that is helpful for the consultation record.

A draft study report was distributed and reviewed by the Fish and Aquatics Technical Working Group White Sturgeon Subteam in April. Please note that additional information has been included in the study report since it was last distributed. Analysis of genetic samples from wild-origin White Sturgeon collected during the study is now complete, and we have included the results of this analysis in the study report.

Comments are to be submitted by EOD Wednesday, July 26, 2023.

Thank you for your participation.

Laura Clark
Licensing & Compliance Specialist
Chelan PUD

Search Comment Items

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Rock Island Relicensing White Sturgeon Population Index Study Report

Chelan County PUD invites stakeholders to provide comments on our draft study report. Please review the document (click "Review Document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

Your Comment

Comments can be submitted through an attachment or provided directly in the space below.

Review Document

Insert comments on Rock Island Relicensing White Sturgeon Population Index Study Report

Upload A File

"Uploading a file is optional"

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment please contact the person listed at the bottom of this page.

Continue »

G.5 RARE, THREATENED, AND ENDANGERED PLANTS STUDY PLAN

RARE, THREATENED, AND ENDANGERED PLANTS STUDY PLAN

ROCK ISLAND HYDROELECTRIC PROJECT

FERC NO. 943

Visalli 2021

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY

327 N. WENATCHEE AVENUE

WENATCHEE, WA 98801

March 2022

RARE, THREATENED, AND ENDANGERED PLANTS STUDY PLAN

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

Kleinschmidt

MARCH 2022

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APPENDICES

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Project). The Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD has initiated informal, early engagement for the relicensing of the Project, which will utilize the Integrated Licensing Process (ILP). Chelan PUD intends to implement this study plan and include it in the Pre-Application Document (PAD). Decision criteria for early study plan development and implementation have been designed to match those described in FERC's guidance for applying study criteria in the ILP[1] .

[1] FERC, *A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria* (March 2012). https://www.ferc.gov/sites/default/files/2020-07/guide-study-criteria.pdf

2.0 STUDY GOALS AND OBJECTIVES

The goal of this Rare, Threatened, and Endangered (RTE) Plants Study Plan is to perform a land survey to locate any occurrences of terrestrial, wetland, and above water aquatic federal and state-listed vascular plant, bryophyte, and lichen species occurring in the Study Area (Figure 4-1). The Study Area is defined as areas within the Project Boundary as outlined in the most up to date Exhibit G Project Maps (Project Boundary), the Home Water Wildlife Preserve, and within the primary transmission corridor (Figure 4-2). For the purposes of this study, RTE plant species include: Endangered Species Act (ESA) Federally listed species, ESA Federal Proposed or Candidates, ESA Federal Species of Concern, Washington State listed species (Endangered, Threatened, or Sensitive), and Bureau of Land Management (BLM) Sensitive Species.

The objective is to record (map and document) all RTE species located within the Study Area. If any RTE species are identified, a subsequent assessment of Project impacts on the RTE species present will be initiated.

3.0 RELEVANT RESOURCE MANAGEMENT GOALS OR PUBLIC INTEREST CONSIDERATIONS

This study plan relates to species listed under the federal ESA and similar programs under federal and Washington State law.

The federal ESA was passed in 1973 to protect those plants, animals, and associated habitats that are in danger of becoming extinct. The ESA is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Marine Fisheries Service (NOAA Fisheries). Terrestrial and freshwater species are the primary responsibility of the USFWS. Species may be listed as endangered or threatened under the ESA. Endangered species are "in danger of extinction throughout all or a significant portion of its range." Threatened species are "likely to become endangered within the foreseeable future" (USFWS 2017). Under authority of the ESA, federal agencies are required to analyze the effects of actions they undertake or authorize on federally listed species and their assigned critical habitat, in consultation with the USFWS. Information regarding the presence of federally listed plants in the Study Area is necessary to assess potential effects. Therefore, field surveys utilizing methodology based on USFWS Interim Survey Requirements for Ute Ladies'-tresses Orchid (1992) are necessary, as is assessment and disclosure of the potential effects of ongoing Project operations and maintenance activities on the species and its habitat.

The BLM also assigns conservation status to RTE plants. While the USFWS is responsible for implementation of the ESA as it relates to plant species, the BLM prepares lists of Sensitive and Strategic Species based on whether they are documented or suspected on agency land in Washington (Interagency Special Status/Sensitive Species Program).

The Washington Natural Heritage Program (WNHP) generates lists of plants and nonvascular species considered to be rare and of conservation concern in Washington. Nearly 10% of the vascular plants in Washington are considered to be rare or at risk. Rare species may serve as indicators of ecological health, they may be keystone species in ecosystems, or contain genetic material of potential value in the development of food and medicine (WDNR 2021a).

4.0 GEOGRAPHIC SCOPE

The Project is located on the Columbia River in Chelan County and Douglas County, Washington, from Columbia River mile (RM) 453.4 to RM 473.7 (NMFS 2002).

The geographic extent of the Study Area (Figure 4-1) for the RTE plant surveys includes:

- The Project Boundary (Figure 4-2), the FERC-designated geographic extent of the Project, which encompasses 7.73 square miles (4,944 acres) of land, as well as the Rock Island Reservoir, and 9.83 acres of federally owned lands administered by the Bureau of Land Management (BLM).
- The Home Water Wildlife Preserve property (960 acres), a FERC required mitigation parcel.
- Lands within the Project's primary transmission corridor.

The survey effort will include suitable habitat up to a 100-foot buffer on any adjacent public lands adjacent to the Study Area.

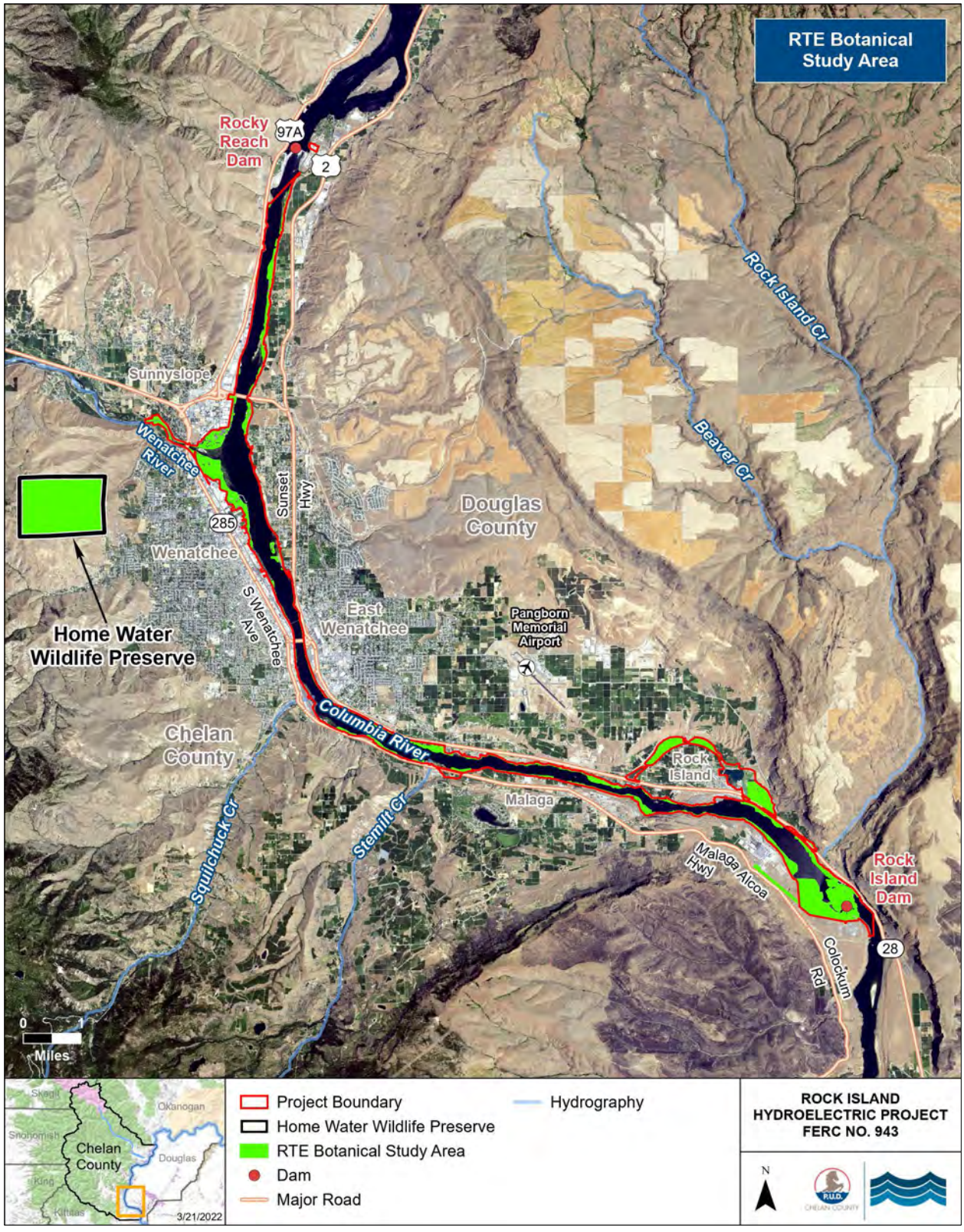

Figure 4-1 Rock Island Hydroelectric RTE Plant Study Area

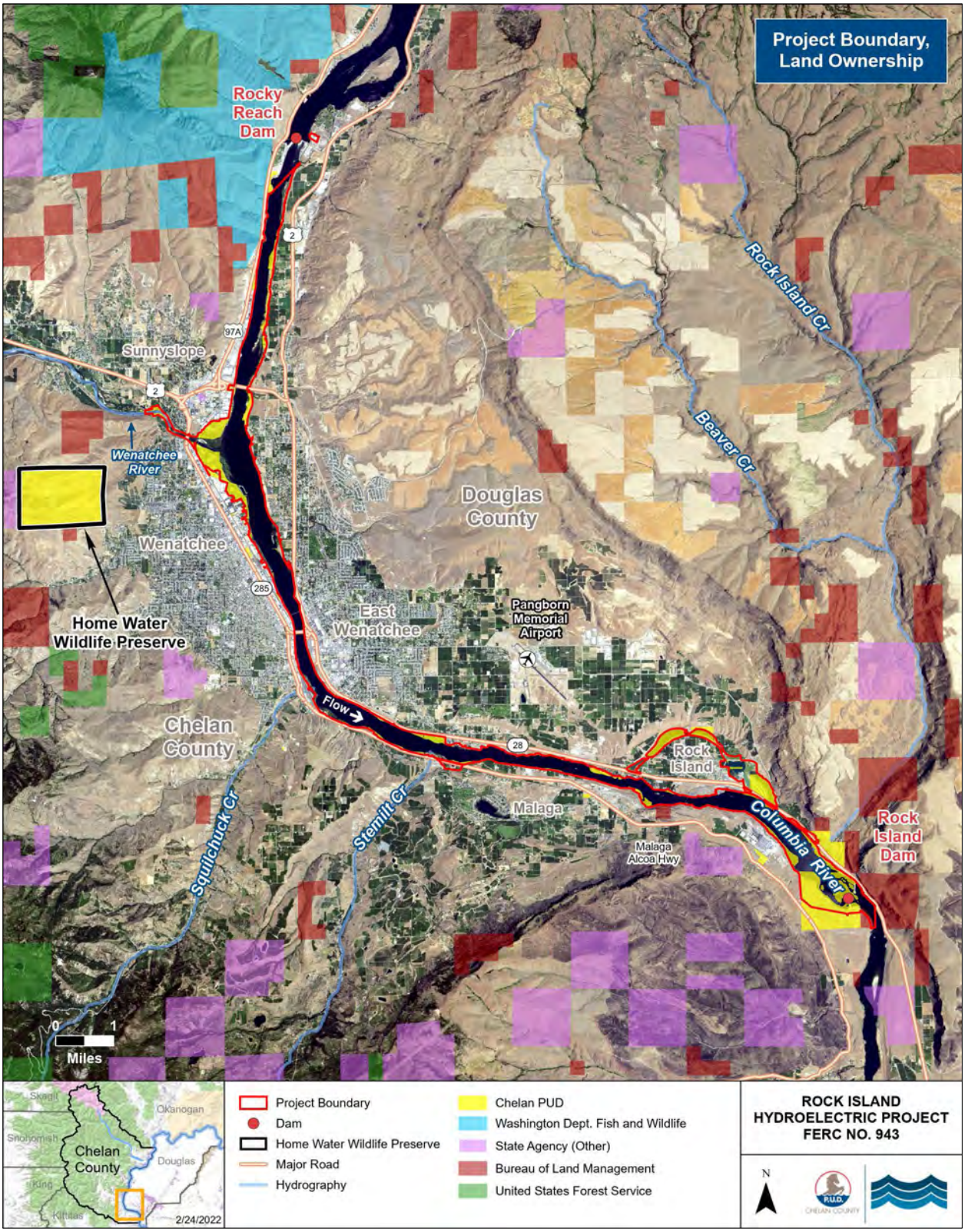

Figure 4-2 Rock Island Hydroelectric Project Boundary and Land Ownership

5.0 EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

One federal and state listed plant species has been identified near the Rock Island Reservoir:

- Ute ladies'-tresses (S*piranthes diluvialis*) (ULT) is federally threatened and state endangered (WADNR 2021).

ULT were discovered within the Rocky Reach Project Boundary in 2000 (Calypso 2000) during a RTE plant survey and have been monitored in that area since then (Pope and Cordell 2020).

Within the Rock Island Project Boundary, two state-listed RTE plant species occurrences have been previously documented within the study area:

- Gray cryptantha (*Cryptantha leucophaea*)
- Little bluestem (*Schizachyrium scoparium var. scoparium*)

One gray cryptantha occurrence was documented within the Coyote Dunes Natural Area (Chelan PUD 2018). Additionally, little bluestem was located between Odabashian Bridge and Rocky Reach Dam in 2001 (WDNR 2021c)

Review of the 2021 Washington Vascular Plant Species of Conservation Concern and the 2021 Status of Federally Listed Plant Taxa in Washington State lists identified RTE plant species with the highest potential to be found near the Rock Island study area (Table 5-1) (WADNR 2021a and 2021b).

Table 5-1 RTE Plant Species with Highest Potential to Occur in the Study Area

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS[1]	HABITAT
Pasqueflower	*Anemone patens var. multifida*	SS, BLM-S	Prairies, open slopes, ridges, open forests
Northern wormwood	*Artemisia borealis var. wormskioldii*	FC, SE, BLM-S	Basalt, compact cobbles, near riparian areas in Columbia River basin
Palouse milkvetch	*Astragalus arrectus*	ST, BLM-S	Grassy hillsides, sage flats, river bluffs, openings in pine forest
Pauper milkvetch	*Astragalus misellus var. pauper*	ST, BLM-S	Open ridgetops, and gentle upper slopes, rarely middle and lower slopes, mostly along the western margin of the Columbia River Basin.
Whited's milkvetch	*Astragalus sinuatus*	SE, BLM-S	Rocky hillsides in shrub-steppe
Narrow-stem cryptantha	*Cryptantha gracilis*	SS, BLM-S	Basalt talus, dry rocky drainages in sagebrush habitats
Gray cryptantha[2]	*Cryptantha leucophaea*	ST, BLM-S	Sandy substrates, particularly sand dunes that have not been completely stabilized.
Desert cryptantha	*Cryptantha scoparia*	SS, BLM-S	South-facing slopes and ridges, in silt and talus in shrub-steppe
Snake River cryptantha	*Cryptantha spiculifera*	SS, BLM-S	Dry open shrub-steppe areas in habitats with low vegetative cover
Wenatchee larkspur	*Delphinium viridescens*	ST, BLM-S	Moist meadows in tree thickets and coniferous forests, springs, seeps, riparian areas
Thompson's sandwort	*Eremogone franklinii var. thompsonii*	SS	Low elevation, stabilized to partially stabilized sand dunes
Dwarf mooncup	*Eremothera pygmaea*	SS, BLM-S	Unstable soil in steep talus, dry washes, roadcuts; in shrub-steppe

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS[1]	HABITAT
Suksdorf's monkeyflower	*Erythranthe suksdorfii*	SS, BLM-S	Open moist to dry habitats, vernal pools, swales, in shrub-steppe
Common bluecup	*Githopsis specularioides*	SS, BLM-S	Low elevation, dry open places, balds, talus, gravelly prairies,
Sagebrush stickseed	*Hackelia hispida var. disjuncta*	SS, BLM-S	Basalt talus, cliffs, outcrops; sparely vegetated dry sites
Large St. John's-wort	*Hypericum majus*	SS	Low wet places, ponds, lakes, riparian habitat; submerged for part of the growing season.
Inch-high rush	*Juncus uncialis*	ST, BLM-S	Vernal pools and pond edges, in lithosol habitats in shrub-steppe
Delicate gilia	*Lathrocasis tenerrima*	SS, BLM-S	Rocky outcrops, bare gravelly openings in big sage shrub-steppe
Rone's biscuitroot	*Lomatium roneorum*	SE	Steep, sparsely vegetated slopes, sandstone soils, open pine forests
Coyote tobacco	*Nicotiana attenuata*	SS, BLM-S	Dry, sandy bottomlands, rocky washes, and other dry places.
Adder's tongue	*Ophioglossum pusillum*	SS-BLM-S	Seasonally wet areas, meadows, grassy swales, flood plains
Dark-spine ball cactus	*Pediocactus nigrispinus*	SS, BLM-S	Thin, rocky soils on slopes, ridgetops, valleys in shrub-steppe
Whited's fuzzytongue Penstemon	*Penstemon eriantherus var. whitedii*	ST, BLM-S	Slopes, ridgetops, dry rocky areas in Cascades foothills
Chelan rockmat	*Petrophyton cinerascens*	SE, BLM-S	In crevices and on ledges of open, exposed cliffs and rock outcrops along the Columbia River.
Sticky phacelia	*Phacelia lenta*	ST, BLM-S	Arid Columbia Basin basalt cliff crevices, ledges, adjacent open rocky

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS[1]	HABITAT
			habitats. Occasionally on talus below rock outcrops.
Columbia yellowcress	*Rorippa columbiae*	ST, BLM-S	Riverbanks, lakes and streams with extended periods of dryness.
Little bluestem[2]	*Schizachyrium scoparium var. scoparium*	SS, BLM-S	Open places in sand, silt, cobble, and gravel, above and below the high-water line of the Columbia River, often in riparian communities.
Scouler's catchfly	*Silene scouleri ssp. scouleri*	SS, BLM-S	Grassy bluffs, rocky ridges, timbered slopes, upland meadows
Strict blue-eyed grass	*Sisyrinchium montanum var. montanum*	SS, BLM-S	Moist meadows, streambanks, open woods, in steppe and montane areas
Ute ladies'-tresses	*Spiranthes diluvialis*	SE, FT	Low-elevation wetlands, moist meadows, temporarily flooded sites with low vegetation cover
Thompson's clover	*Trifolium thompsonii*	ST, BLM-S	Lower mountain slopes and ridges in grasslands dominated by bunchgrasses and herbs.
Navel lichen	*Umbilicaria phaea var. coccinea*	SE, BLM-S	Exposed to partly shaded basalt, on steep slopes, low to moderate elevations, in arid habitats

Source: BLM 2021, USFWS 2012, WADNR 2021a and 2021b.
[1]FE = Federally Endangered; FT = Federally Threatened; SE = State Endangered; ST = State Threatened; SC = Candidate; SS = State Sensitive; BLM-S = BLM WA Sensitive
[2]Recorded within the Project Boundary

6.0 PROJECT NEXUS AND RATIONALE FOR STUDY

Project operations and maintenance activities have the potential to affect federal and state listed plant species. For example, Project operations affect water levels in the Project reservoir and hydrologic conditions which may affect RTE riparian species. Similarly, recreation areas and activities related to the Project may affect RTE plants. Other effects could include encroachment or competition by noxious weeds. These and other changes are expected to vary across the Study Area and will be considered specifically in areas where RTE species are found.

This study will consider federally listed species under the ESA, BLM-listed, and state-listed plant species that are known or have the potential to exist within the Study Area. As described in Section 3.0, one federally listed species, the ULT is known to occur in the vicinity of the Project.

7.0 STUDY METHODOLOGY

The Study Area will be surveyed by foot and boat between April/May and August/September 2022. Survey times will be chosen to coincide with the optimal time RTE plants in the area are identifiable. ULT and other riparian RTE plants bloom in late summer while other RTE plants typically bloom during the spring season. Thus, upland areas will be surveyed earlier in the season, and wetland areas will be surveyed later in the season.

The RTE plant survey will be conducted using the focused (intuitive controlled) method, whereby habitats with higher potential to support RTE species will be surveyed with greater intensity than areas with low potential. Areas with no discernible native plant communities present will not be surveyed. Two qualified botanists will conduct the survey.

The Interim Survey Requirements for ULT issued November 23, 1992 and updated in 2017 by the USFWS[2] provides guidance for conducting surveys for ULT (USFWS 1992). This methodology will be adapted to guide ULT surveys within the Study Area. Typically, this survey protocol requires three years of surveys because the species may not emerge and flower every year.

WNHP sighting forms will be completed for each RTE plant population located. Known RTE plant occurrences in the Study Area will be resurveyed. Sighting forms include detailed information, such as population size, area, habitat, substrate, disturbance, threats, and associated plant species. Populations will be mapped on Project maps with the aid of a global positioning system (GPS) unit. RTE plant population locations mapped with the aid of this GPS unit are generally accurate to within three meters.

All RTE plant occurrences will be photographed (close-ups of individual plants and more general habitat shots). Plants will be collected only when it is deemed necessary to identify the plant.

The majority of plants will be identified in the field using the Flora of the Pacific Northwest (Hitchcock and Cronquist 2018). If necessary, plant determinations will be supplemented by other regional floras and published papers. Comprehensive vascular plant species lists of all species observed will be compiled for the Home Water Wildlife Preserve and for the rest of the Study Area. Scientific and common names for all species will conform to the nomenclature found in the Flora of the Pacific Northwest (Hitchcock and Cronquist 2018).

[2] https://www.fws.gov/media/1992-interim-survey-requirments-ute-ladies-treses-revised-2017pdf

Specialized habitat types that occur in the Study Area which may support RTE plant species include:

- Bedrock outcroppings;
- Steep sand or gravel slopes;
- Level gravel banks;
- Low sand dunes;
- Grassy riparian areas;
- Wooded riparian areas;
- Wetlands with emergent vegetation;
- Vernally moist areas; and
- Shrubsteppe.

8.0 SCHEDULE, PERIODIC REPORTING, AND CONSULTATION

Chelan PUD has retained a consultant to conduct field investigations and data gathering efforts. Chelan PUD staff will oversee contracting and the deliverable schedule for the consultant. The consultant conducting the contracted investigations will be required to provide equipment and staff to conduct the contracted investigations with minimal field support from Chelan PUD, with the exception of a boat and driver which will be provided by the Chelan PUD for a portion of the fieldwork. Chelan PUD involvement will include study plan development and implementation, project oversight, providing input to the consultant(s) regarding decisions made by those involved in the relicensing process, and promoting discussion among stakeholders regarding study results.

Tasks include:

- Desktop review and pre-field consultation: Literature review of relevant existing information, and of BLM and WNHP databases.
- Participation in Wildlife and Botanical Technical Working Group meetings, as appropriate.
- Field Surveys 2022: Initial reconnaissance and field surveys on foot and by boat within the Study Area. Some areas will require both early and late season surveys.
- Development of RTE Plant Layer for GIS: Locations of RTE plants to be shared with only authorized agencies due to confidentiality considerations.
- Data Analysis: Herbarium research and correspondence with taxonomic experts, if needed.
- Report Writing: Draft and final reports, and relevant materials prepared for Chelan PUD.

Please see the consultation record for this plan in Appendix A.

9.0 LEVEL OF EFFORT AND COST

The estimated cost of conducting the proposed RTE Plants Study is within the range of $70,000 to $90,000. The proposed study effort should be adequate to provide the level of information needed to understand Project effects, impacts or benefits to the resource, and to determine the need for any specific PM&E actions.

10.0 REFERENCES

Bureau of Land Management (BLM). 2021. Final Region 6 Regional Forester and OR/WA State Director Special Status Species List, June 21, 2021.

Calypso Consulting. 2000. A Rare Plant Survey of the Rocky Reach Reservoir, Rocky Reach Hydroelectric Project, FERC No. 2145. Bellingham, WA.

Hitchcock, C.L.; Cronquist, A. 2018. Flora of the Pacific Northwest. Seattle, WA: University of Washington Press. 750 pp.

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_____. 2017. Endangered Species: Endangered Species Act Overview. [Online] URL: https://www.fws.gov/endangered/laws-policies/.

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_____. 2021c. Washington Natural Heritage Program, Washington Department of Natural Resources. Olympia, WA. U.S.A. Available at https://www.dnr.wa.gov/NHPdata.

APPENDIX A CONSULTATION RECORD

Chelan PUD submitted the draft RTE Plants Study Plan to the Wildlife and Botanical Technical Working Group (TWG) (see Table A-1) via email on March 28, 2022 for a 10-business day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table A-2 below.

Table A-1 Organization Names and Wildlife and Botanical TWG Member Names

ORGANIZATION	NAME
American Rivers	Moran, Bridget
Audubon Society	Johnston, Mark
Audubon Society	McCammon, Bruce
Bureau of Indian Affairs	Peone, Rudy
Chelan County	Pfleeger, Adam
Chelan County	Sanderson, Julie
City of Wenatchee	Merrill, Laura
Confederated Tribes and Bands of Yakama Nation	Blodgett, David
Confederated Tribes and Bands of Yakama Nation	Ganuelas, Leon
Confederated Tribes and Bands of Yakama Nation	Harvey, Elaine
Confederated Tribes and Bands of Yakama Nation	Nuetzmann, Mark
Confederated Tribes of the Colville Reservation	Rushing, Sam
Confederated Tribes of the Colville Reservation	Whitney, Richard
Confederated Tribes of the Umatilla Indian Reservation	Pitt, Joe
Individual	Hays, Steve
Northwest Power and Conservation Council	Horton, Stacy
Northwest Power and Conservation Council	Mounts, Sara
US Bureau of Land Management	Boyter, Molly
US Bureau of Land Management	Clark, Linda
US Bureau of Land Management	Clark, Lisa
US Bureau of Land Management	Ellis, Erik
US Fish and Wildlife Service	Callaway, Tara
US Fish and Wildlife Service	Lewis, Steve
US Fish and Wildlife Service	Riggs, Randi
Washington Native Plant Society	Ballinger, Susan
Washington State Department of Fish and Wildlife	Blank, Benjamin
Washington State Department of Fish and Wildlife	Jeffreys, Emily
Washington State Department of Fish and Wildlife	Jewell, Sgt. Mike
Washington State Department of Fish and Wildlife	Verhey, Patrick
Washington State Dept of Natural Resources	Huinker, James
Washington State Dept of Natural Resources	Preston, Cindy
Washington State Parks	Fielding, Andrew
Washington State Parks	Harris, Chelsea

Table A-2 Comments Received

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
A-1-1	3/30/22	Adam Pfleeger, Chelan County Noxious Weed Department	Rock Island Relicensing Rare, Threatened, and Endangered Plants Study Plan	The plant survey plan seems good in terms of targeting and locating rare plants. What I believe could be improved is study methodology of clearing identifying what and how "threats" will be surveyed. To fully utilize the survey effort that is already being put forth would be to also locate and survey threats (i.e., noxious weeds) to these rare plants. My biggest concern is noxious and non-native plant species out competing the rare and endangered plants that are out there. This is already being observed with yellow flag iris encroaching on Ute ladies'-tresses habitat in Rocky Reach Project Boundary. Locating, surveying, and controlling the noxious weeds that are on these lands will be one of the main ways to protect the rare and endangered species. This seems like a great opportunity to initiate the broader ecological goals of not only locating these rare and endangered plants but to also protect them from invasive species.	The goal of the RTE plant Study is to locate any RTE plant species in the Project Area. If any RTE plants are found within the Rock Island Project during the RTE survey, they will be documented. For all RTE plant species documented, associated species in the immediate vicinity will be recorded on the Element Occurrence form, including noxious weeds. Once we know where the RTE species occur within the Study Area, we can consider potential project effects to those species, including noxious weeds and/or potential effects from Project operations and maintenance.
A-2-1	4/11/22	Tara Callaway	Rock Island Relicensing Rare, Threatened, and Endangered Plants Study Plan	I appreciate the opportunity to provide a comment on the "Rare, Threatened, and Endangered Plants Study Plan" (Plan). The Plan I reviewed followed my understanding based on a previous meeting with Chelan PUD. I appreciate them including 3 years of surveys for Ute ladies'-tresses due to the species ability to remain dormant underground for several years. I have no suggested edits to the Plan. Thank you.	Comment noted. Thank you for your response.

From:	RIRelicensing
To:	RIRelicensing; "Adam.Pfleeger@CO.CHELAN.WA.US"; "andrew.fielding@parks.wa.gov"; "Benjamin.Blank@dfw.wa.gov"; "blod@yakamafish-nsn.gov"; "bmoran@americanrivers.org"; "calypso@openaccess.org"; "Chelsea.Harris@parks.wa.gov"; "cindy.preston@dnr.wa.gov"; "edellis@blm.gov"; "emily.jeffreys@dfw.wa.gov"; "hare@yakamafish-nsn.gov"; "James.Huinker@dnr.wa.gov"; "JoePitt@ctuir.org"; Kelly Cordell; "krugani@kearnswest.com"; "Leon_Ganuelas@yakama.com"; "lmerrill@wenatcheewa.gov"; "mark_nuetzmann@yakama.com"; "molly_boyter@blm.gov"; "Nathalie.Denis@Kleinschmidtgroup.com"; "Patrick.Verhey@dfw.wa.gov"; "randi_riggs@fws.gov"; "richard.whitney@colvilletribes.com"; "Rudy.peone@bia.gov"; "sam.rushing@colvilletribes.com"; "sghays51@msn.com"; "shorton@nwcouncil.org"; "SMounts@NWCouncil.org"; "stephen_lewis@fws.gov"; "tara_callaway@fws.gov"; Von Pope
Cc:	"Jeff Deason"; Ben Truscott; Janel Ulrich
Subject:	RE: Rock Island Relicensing: RTE Plants Study Plan - Comment Opportunity
Date:	Friday, April 8, 2022 8:48:46 AM
Attachments:	image001.png

Greetings,

This is a reminder email to please provide your comments on the RTE Plants Study Plan document by Monday, April 11.

Thank you!

Kate Taylor
Support Specialist

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Monday, March 28, 2022 11:24 AM
Subject: Rock Island Relicensing: RTE Plants Study Plan - Comment Opportunity

Good morning, Wildlife & Botanical TWG:

As noted in our last TWG meeting, here is the link to comment on the Draft RTE Plants Study Plan. Click the link below to access the document as well as the opportunity to comment.

Rock Island Relicensing Rare, Threatened, and Endangered Plants Study Plan

Comments are to be submitted by EOD Monday, April 11.

Thank you for your participation.

Kate Taylor
Support Specialist - Relicensing

Search Comment Items

Public Comment Form

Rock Island Relicensing Rare, Threatened, and Endangered Plants Study Plan

Chelan County PUD invites stakeholders to provide comments on our draft study plan.

Please review the document (click "review document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

CLICK HERE TO REVIEW DOCUMENT

Upload File

Continue »

Rock Island Relicensing Team

RIRelicensing@chelanpud.org

G.6 RECREATION RESOURCES INVENTORY STUDY PLAN AND STUDY REPORT

RECREATION RESOURCES INVENTORY STUDY PLAN

ROCK ISLAND HYDROELECTRIC PROJECT

FERC PROJECT NO. 943

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY

327 N. WENATCHEE AVENUE

WENATCHEE, WA 98801

JULY 2022

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1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 943) (Project). The Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

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[1] FERC, *A Guide to Understanding and Applying the Integrated Licensing Process Study Criteria* (March 2012). https://www.ferc.gov/sites/default/files/2020-07/guide-study-criteria.pdf

2.0 STUDY GOALS AND OBJECTIVES

Study Goals

The goals of the Recreation Resources Inventory are to:

1. Inventory FERC-approved recreation sites identified in the Rock Island Project Recreation Plan (i.e., Exhibit R of the current FERC license).

2. Provide general documentation of non-Rock Island Project recreation sites that are not regulated by FERC under the Rock Island Project Recreation Plan but are within the Rock Island Project Boundary.

3. For the purposes of identifying comparable recreation opportunities near the Rock Island Project, identify developed public recreation sites and facilities within the general vicinity (i.e., approximately a 1-hour drive or up to 60 miles) of the Rock Island Project.

Study Objectives

Specifically, the 2022 Recreation Resources Inventory will:

- Field verify, map, and document FERC-approved Rock Island Project recreation sites and facilities developed by Chelan PUD as part of the Recreation Plan for the Rock Island Project.
- Document the general condition of FERC-approved Rock Island Project recreational sites and facilities in the Recreation Plan and describe their maintenance, inspection and/or management practices.
- Field verify, map, and document non-Rock Island Project public recreation sites and facilities that support publicly-available recreation within the existing Rock Island Project Boundary.
- Identify recreation sites within the general vicinity of the Rock Island Project that provide comparable recreation opportunities as the sites identified in the FERC-approved Rock Island Project Recreation Plan.

3.0 RELEVANT RESOURCE MANAGEMENT GOALS AND/OR PUBLIC INTEREST CONSIDERATIONS

Existing management plans will be reviewed and used to develop a baseline understanding of the current recreation management goals and objectives in the Rock Island Project vicinity. Relevant management plans include the following:

- Chelan PUD Recreation Plan for the Rock Island Project 1979, amended 2018;
- Chelan County Comprehensive Plan 2017-2037;
- Chelan County Shoreline Master Plan 2021;
- Chelan PUD's Rock Island Land Management Program;
- Chelan PUD's Rock Island Public Safety Plan;
- Douglas County 2009 Regional Shoreline Master Program;
- 2018-2022 Recreation and Conservation Plan for Washington State (State Comprehensive Outdoor Recreation Plan [SCORP]);
- 2018-2024 Parks, Recreation and Open Space Comprehensive Plan for the city of Wenatchee;
- 2020-2026 Eastmont Metropolitan Park District Parks and Recreation Comprehensive Plan;
- Rock Island Urban Growth Area Comprehensive Plan 2018; and
- Washington State Parks and Recreation Commission (Washington State Parks). 2007. Wenatchee Confluence Area State Parks Management Plan. Olympia, Washington.

4.0 GEOGRAPHIC SCOPE

The geographic scope for this study will be divided into the following categories:

- FERC-approved recreation sites and facilities identified in the Rock Island Project Recreation Plan; (Figure 4-1)
- Non-Rock Island Project publicly available recreation sites within the Rock Island Project Boundary; and
- Publicly available recreation sites within the general vicinity (i.e., approximately a 1-hour drive or up to 60 miles) of the Rock Island Project Boundary that provide comparable recreation opportunities as the sites identified in the FERC-approved Rock Island Project Recreation Plan .

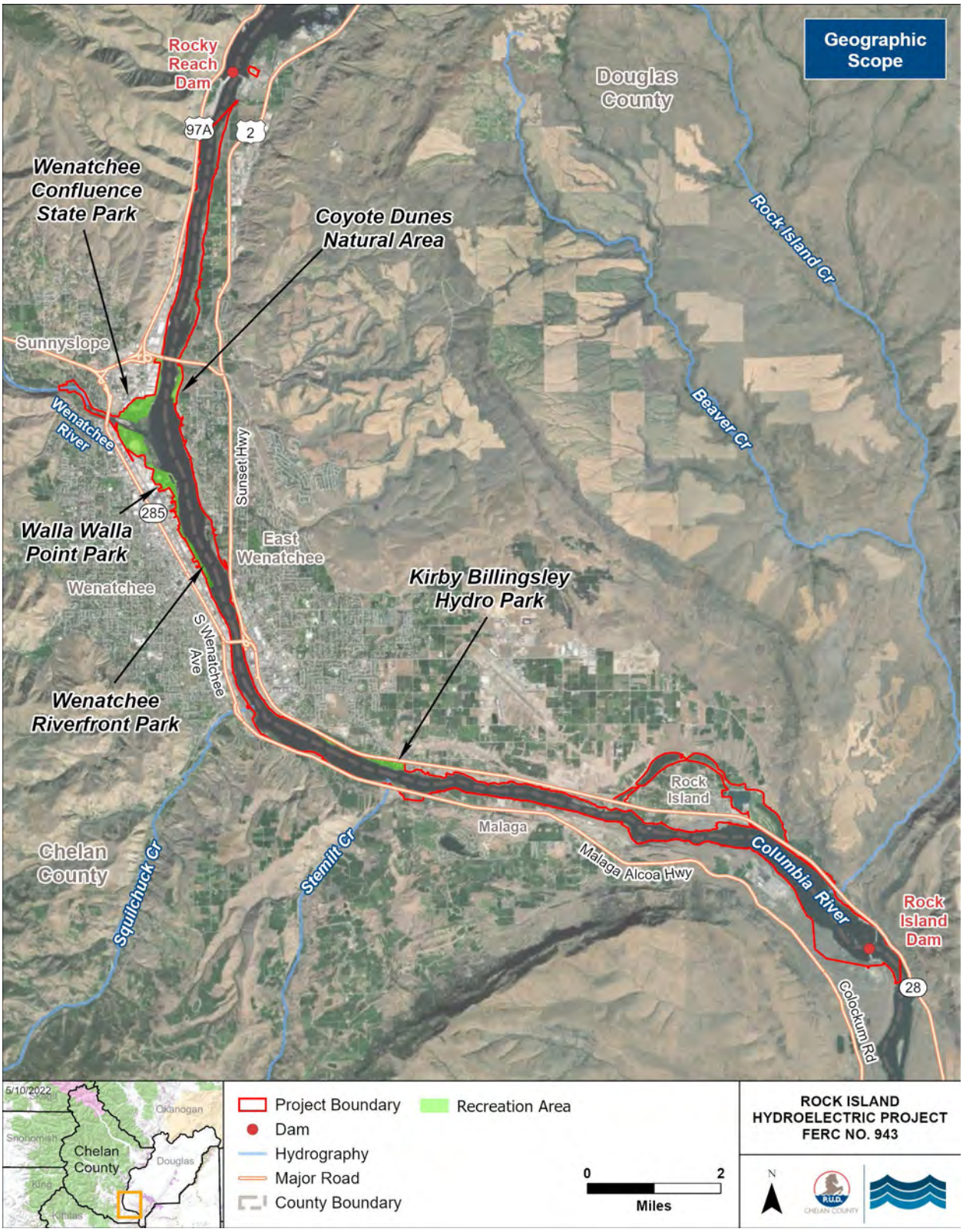

Figure 4-1 Existing Rock Island Project Recreation Sites Owned by Chelan PUD

5.0 EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

This section provides a summary of relevant existing recreational information for the Rock Island Project. In addition to the resource management plans discussed in Section 3.0, other sources of existing information include:

1. FERC-approved Recreation Plan for the Rock Island Project, and associated FERC filings and license amendments:
    a) 1979 FERC Order approving Chelan PUD's Recreation Plan:
        - Wenatchee Confluence State Park;
        - Walla Walla Point Park;
        - Wenatchee Riverfront Park; and
        - Kirby Billingsley Hydro Park.
    b) 2018 FERC approved license amendment
        - Coyote Dunes Natural Area;
2. Chelan PUD's Licensed Hydropower Development Recreation Report, FERC Form No. 80 (2015);
3. Recreation Studies conducted by the firm MIG for Chelan PUD (2013-2015);
4. City of Wenatchee Annual Reports (2018, 2019); and
5. Chelan PUD's Preliminary Information Document (PID) for the Rock Island Hydroelectric Project.

Need for Additional Information

An inventory of existing public recreational sites and facilities within the Rock Island Project Boundary would provide information regarding the condition of existing FERC-approved recreation sites as well as baseline information regarding non-Rock Island Project public recreation sites within the Rock Island Project Boundary. Information regarding non-Rock Island Project public recreation opportunities within the vicinity of the Rock Island Project Boundary would provide information to characterize comparable recreation opportunities within the vicinity of the Rock Island Project.

6.0 PROJECT NEXUS AND RATIONALE FOR STUDY

Under Section 10(a) of the Federal Power Act, recreation is considered a beneficial public use. Therefore, FERC will consider the Project's consistency with comprehensive management plans developed by state or federal agencies for the Columbia River. The 1965 Land and Water Conservation Fund was created and administered by the Bureau of Outdoor Recreation. This funded state outdoor recreation facilities and the State Comprehensive Outdoor Recreation Plan (SCORP). In meeting its obligations for public recreation, the Federal Power Act directs FERC to consider federal and state comprehensive management plans. Washington's SCORP document is an important source for evaluating recreation demands and trends. An updated SCORP is anticipated for 2023 as the existing plans coverage ends in 2022.

When deciding whether to issue a new license for the Rock Island Project, FERC considers the recreational and other non-developmental values of the Project, as well as power and developmental values. Part of this decision is FERC's determination of any conditions that should be included in a new license to be best adapted to improve or develop the Rock Island Project waters for all beneficial public uses. Reasonable consideration of the effects of continued Project operation pertaining to recreational opportunities and access in the Rock Island Project Boundary is in the public interest.

The Rock Island Project has potential direct and indirect effects on recreation resources within and adjacent to the Rock Island Project Boundary. These effects include providing public access to natural open space areas within and surrounding the Rock Island Project for a variety of recreation activities, and access to and use of the Columbia River for recreation purposes. Chelan PUD owns and operates 1,500 acres of land with public access along the Rock Island Project's 20-mile reservoir, including approximately 400 acres of public parks developed within the Rock Island Project Boundary. Currently FERC-approved recreation facilities under the Recreation Plan for the Rock Island Project consist of Wenatchee Confluence State Park, Walla Walla Point Park, Wenatchee Riverfront Park, Kirby Billingsley Hydro Park, and the Coyote Dunes Natural Area. Facilities at these five developed recreation sites include campgrounds, multi-use sports fields, boat launches and docks, swimming areas, tennis and volleyball courts, playgrounds, horseshoe courts, paved and dirt walking trails, picnic shelters (with tables and barbeque grills), showers, restrooms, informational and interpretive signage, overlook points, and artistic sculptures for public enjoyment and education.

Study results from the Recreation Resources Inventory Study will help inform Chelan PUD and other stakeholders by cataloging the information collected and defining a baseline inventory of recreation facilities within, adjacent to and/or in the vicinity of the Rock Island Project. The

inventory will also help inform FERC's licensing decisions relative to public recreation within the Rock Island Project Boundary.

7.0 STUDY METHODOLOGY

This section provides the study methodology for each of the geographic scopes, including data collection and analysis techniques, and a schedule for appropriate field season(s) and duration.

Desktop Review

The desktop review will collect information on public recreation sites identified in Section 4.0 (Geographic Scope). Information sources for this assessment will include relevant local, state, and federal recreation plans (listed in Sections 3.0 and 5.0), recreation guidebooks, maps, tourist information, magazine articles, online descriptions of recreation opportunities and trips, and fishing regulations. This assessment will include existing comprehensive management plans applicable to the Rock Island Project Boundary. Information gathered during the desktop review will be completed in order to develop a list of non-Rock Island Project public recreation sites within the Rock Island Project Boundary and public recreation sites within the vicinity of the Rock Island Project Boundary. A field survey, (Section 7.2), will be conducted on: (1) recreation sites identified in the Rock Island Project Recreation Plan; and (2) non-Rock Island Project publicly available recreation sites identified within the Rock Island Project Boundary.

Field Survey

Field surveys will be conducted at public recreation sites identified in the desktop review (Section 7.1) that are located within the Rock Island Project Boundary. Information collected during field surveys will be documented on the Recreation Site Inventory Form (Appendix A). Information to be collected will include the following:

7.1.1 FERC-Approved Rock Island Project Recreation Sites within the Rock Island Project Boundary

- GPS location of the facilities;
- type, number, and condition of amenities provided at each site;
- an estimate of parking capacity;
- ownership and management;
- hours/seasons of operation;
- existing safety, security, and informational (signage) measures;
- observations of site use and accessibility;
- suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities; and
- accompanying photographs.

7.1.2 Non- Rock Island Project Public Recreation Sites within the Rock Island Project Boundary

- GPS location of the facilities;
- general description of amenities provided at each site;
- existing informational signage;
- accompanying photographs.

Results

A compilation and summary for each public recreation site within the existing Rock Island Project Boundary will be made based on data collected during the desktop review and field surveys. A summary of the recreation sites within the vicinity of the Rock Island Project will be provided based on the desktop review. A study report will be provided to the Recreation and Land Use Technical Working Group (TWG) during the fourth quarter of 2022. A copy of the final study report will be included in the Pre-Application Document (PAD) in 2023.

8.0 SCHEDULE, PERIODIC REPORTING, AND CONSULTATION

This study will begin in the summer of 2022. Preliminary results and reports will be provided at appropriate milestones, in accordance with 18 CFR § 5.9. Throughout the study process, Chelan PUD will engage with the members of the Recreation and Land Use TWG, resource agencies, Tribes, and other interested stakeholders.

The report for this study will adhere to FERC's ILP guidance and will include a summary of all information collected and provide a discussion of the findings. The report and analysis will identify existing recreation facilities and their condition to provide background for a recreation use and needs assessment. The results of this study that pertain to recreation facilities within the vicinity of the Rock Island Project Boundary that provide comparable recreation opportunities as the Rock Island Project will also be incorporated into the PAD that is under development (to be submitted in the latter half of 2023), and the technical study report will be appended to the PAD.

Comments received from stakeholders on the technical study report, and how comments were addressed will be provided with the PAD.

Ultimately, the data collected for this study will inform the PAD, the relicensing study program, Exhibit E of the draft and final license applications, and FERC's National Environmental Policy Act analysis for the new Rock Island Project license. Data collected will be available to review by stakeholders in the final technical study report. An analysis of Rock Island Project effects on recreation resources, and proposed protection, mitigation, and enhancement (PME) measures, will be available in the draft and final license applications.

The consultation record for this plan is included in Appendix B.

9.0 LEVEL OF EFFORT AND COST

The level of effort and cost to undertake this study is expected to be within the range of $65,000 to $75,000. The proposed study efforts are adequate to provide the level of information needed to understand the condition and quantity of Rock Island Project public recreation resources, and to determine the need for any further studies or specific PME measures.

10.0 REFERENCES

Chelan County. 2017. Chelan County Comprehensive Plan 2017-2037. Available online: http://www.co.chelan.wa.us/files/community-development/documents/comps_plan/2017%20Comp%20Plan/Attachment%20A%20-%202017-27%20Comprehensive%20Plan.pdf

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Appendix A Recreation Site Inventory Form

RECREATION SITE INVENTORY FORM

Observed by:_____Date/Time: _____

Site Name and Location: _____

Latitude: _____ Longitude_____

Facility Type (Primary Purpose):

Developed Facilities: ☐ Boat Launch ☐ Picnic Area ☐ Angling Access

☐ Campground ☐ Swim Area ☐ Overlook/Roadside Pull-off

☐ Other Day Use: _____

Undeveloped Facilities: ☐ Primitive Campsite ☐ Informal Boat Launch ☐ Informal Angling ☐ Other

---

Road Access: Condition Description: _____

_____

☐ Paved access # entrances _____ # lanes _____ ☐ Circular entrance/exit ☐ Signage

☐ Unpaved access # entrances _____ # lanes _____ ☐ Circular entrance/exit ☐ Signage

---

Parking Lots: Condition Description: _____

_____

Type	# Paved	# Gravel	Space Delineation
ADA Spaces	_____	_____	☐ Painted ☐ Curbs ☐ Signage
Regular Spaces	_____	_____	☐ Painted ☐ Curbs ☐ Signage

Vehicle & Trailer Spaces _____ _____ ☐ Painted ☐ Curbs ☐ Signage

Operations:

☐ Staffed ☐ Unstaffed ☐ Seasonal (From _____To_____)

☐ Fee: (Site $_____; Parking $_____) ☐ Year Round

Operating Hours_____ Owner/Manager_____

Project Facility: _____ Within FERC Project Boundary?_____

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	#	Type	#	Type
_____	Picnic Shelter	_____	Fishing Pier/Platform	_____	Boat Launch/Access
_____	Picnic Tables	_____	Hiking/Walking Trail	_____	Boating Prep Area
_____	Trash Cans	_____	Fishing Trail	_____	Designated Swim Area
_____	Grills	_____	Overlook	_____	Designated Campsite
_____	Firepit/ring	_____	Fishing Prep Area	_____	Safety Signage
_____	Restrooms	_____	Information Kiosk	_____	Informational Signage

_____Other (specify)_____

_____

Boat Launch Facilities: Condition Description: _____

_____

Craft Type: ☐ Motorized ☐ Carry In ☐ Boat Prep Area

Launch Type: ☐ Hard surface ☐ Gravel ☐ Informal (undeveloped)

☐ ADA Compliant ☐ Turn-around area _____ # of Lanes

Fishing Prep Area/Docks: Condition Description: _____

_____

☐ Prep Area ☐ Fishing Dimensions:_____ ☐ ADA Compliant

☐ Prep Area ☐ Fishing Dimensions:_____ ☐ ADA Compliant

Trails: Condition Description: _____

_____

Type:_____ Length (ft):____ Condition: _____ ☐ ADA Compliant

Type:_____ Length (ft):____ Condition: _____ ☐ ADA Compliant

Type:_____ Length (ft):____ Condition: _____ ☐ ADA Compliant

Interpretive/Site Information Condition Description: _____

Display Type: ☐ None ☐ Kiosk ☐ Other ____ No. of Displays

Information Type: ☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type

☐ Regional Events ☐ Other (specify)_____

Sanitation Facilities: Condition Description: _____

_____

	# Flush	(# ADA)	# Portable	(# ADA)
Unisex	_____	(_____)	_____	(_____)

Women	_____	(_____)	_____	(_____)
Men	_____	(_____)	_____	(_____)

Campground/Campsite: Condition Description: _____

_____

	RV sites	Tent sites	Cabins/Cottages	Group sites	Primitive sites
Total # of sites	_____	_____	_____	_____	_____
ADA compliant	_____	_____	_____	_____	_____

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):

_____

_____

APPENDIX B Consultation Record

Chelan PUD submitted the draft Recreation Resources Inventory Study Plan to the Recreation and Land Use Working Group (TWG) (see Table B-1) via email on July 14, 2022 for a 14 day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table B-2 below.

Table B-1 Organization Names and Recreation and Land Use TWG Member Names

ORGANIZATION	NAME
American Rivers	Bridget Moran
American Whitewater	Thomas O'Keefe
Audubon Society	Bruce McCammon
Bureau of Indian Affairs	Rudy Peone
Chelan County Public Utility District No. 1	Ryan Baker
Chelan County Public Utility District No. 1	Ray Heit
Chelan County Public Utility District No. 1	Matt Shales
Chelan County Public Utility District No. 1	Michelle Smith
Chelan County Public Utility District No. 1	Kate Taylor
Chelan County Public Utility District No. 1	Janel Ulrich
Chelan Douglas Regional Port Authority	Stacie De Mestre
City of East Wenatchee	Curtis Lillquist
City of Rock Island	Brock Laughlin
City of Rock Island	James Zumini
City of Wenatchee	Laura Gloria
Complete the Loop Coalition	Peter Burgoon
Complete the Loop Coalition	Mike Sorensen
Confederated Tribes and Bands of Yakama Nation	Elaine Harvey
Confederated Tribes and Bands of Yakama Nation	Tom Iverson
Confederated Tribes and Bands of Yakama Nation	Keely Murdoch
Confederated Tribes of the Umatilla Indian Reservation	Joe Pitt
Eastmont Metropolitan Parks and Recreation	Sally Brawley
Eastmont Metropolitan Parks and Recreation	Charles Brown
Individual	Steve Hays
Individual	John King
Kearns & West	Mary Beth Day
Kearns & West	Angela Hessenius
Kearns & West	Kelsey Rugani
Kleinschmidt Associates	Nathalie Denis
Kleinschmidt Associates	Matt Harper
Kleinschmidt Associates	Fatima Oswald

ORGANIZATION	NAME
Kleinschmidt Associates	Emily Waters
Kleinschmidt Associates	Angela Whelpley
SWCA Environmental Consultants	Nuria Holmes
US Bureau of Land Management	Curtis Bryan
US Bureau of Land Management	Diane Priebe
US Bureau of Land Management	Katherine Russel
US Bureau of Reclamation	Gina Hoff
US Fish and Wildlife Service	Randi Riggs
Washington State Department of Ecology	Mark Peterschmidt
Washington State Department of Ecology	Breean Zimmerman
Washington State Department of Fish and Wildlife	Benjamin Blank
Washington State Department of Fish and Wildlife	Richard Finger
Washington State Department of Fish and Wildlife	Patrick Verhey
Washington State Dept of Natural Resources	Cindy Preston
Washington State Parks	Colleen Foster
Washington State Parks	Chelsea Harris
Washington State Parks	Brian Patnode
Wenatchee Row and Paddle Club	Eric Thorson

Table B-2 Comments Received

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
I-1-1	7/19/22	Colleen Foster	Rock Island Relicensing Draft Recreation Resources Inventory Study Plan	No comments at this time. Colleen	Noted. Thank you for your review.
I-2-1	7/21/22	John King	Rock Island Relicensing Draft Recreation Resources Inventory Study Plan	Reviewed	Noted. Thank you for your review.
A-1-1	7/21/22	Mark Peterschmidt Washington Department of Ecology	Rock Island Relicensing Draft Recreation Resources Inventory Study Plan	There are a number of recreational boating access points, public and private, in the dam pool for the Rock Island Dam. What is the current and projected future use of the Rock Island Dam pool for recreational boating and are the facilities adequate to serve this use and address potential pollution sources associated with this recreational use? As an example: are sewage pump-out and disposal facilities for recreational boating use adequate and conveniently placed to encourage pump-out and disposal of boat sewage?	Thank you for your comment/question concerning the recreational boating access points, public and private, in the Rock Island Project reservoir. Current and projected future use of recreational boating and the adequacy and convenience of the facilities designated in Chelan County PUD's Recreation Plan for the Rock Island Project will be assessed in the upcoming planned Recreation Inventory, Recreation Use, and Recreation Needs Forecast and Analysis Studies.

COMMENT #	COMMENT DATE	NAME/ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
	8/12/22	Chelan PUD	Rock Island Relicensing Draft Recreation Resources Inventory Study Plan	In Section 6.0 of the Recreation Inventory Study Plan, paragraph 3, the word 'facilities' will replace 'amenities and facilities' in paragraph 3, and 'amenities' in paragraph 4, to accurately describe developed recreation sites noted – like campgrounds, sports fields, boat launches, swimming areas, etc.	Wording replaced.

From:	RIRelicensing
To:	RIRelicensing
Cc:	"Benjamin.Blank@dfw.wa.gov"; "Patrick.Verhey@dfw.wa.gov"; Matt Shales; "cLillquist@eastwenatcheewa.gov"; "Richard.Finger@dfw.wa.gov"; "bmoran@americanrivers.org"; "stacie@cdrpa.org"; "bruce.mccammon@gmail.com"; "brian.patnode@parks.wa.gov"; "colleen.foster@parks.wa.gov"; RIRelicensing; "bzim461@ecy.wa.gov"; "cbryan@blm.gov"; "Chelsea.Harris@parks.wa.gov"; "cindy.preston@dnr.wa.gov"; "diane_priebe@blm.gov"; "epthome509@gmail.com"; "ghoff@usbr.gov"; "hare@yakamafish-nsn.gov"; "ivet@yakamafish-nsn.gov"; "john@kingrose.us"; "mape461@ecy.wa.gov"; Matthew Harper; "murk@yakamafish-nsn.gov"; "okeefe@americanwhitewater.org"; "randi_riggs@fws.gov"; "Rudy.peone@bia.gov"; Ryan Baker; "sghays51@msn.com"; "treasurer@rockislandwa.gov"; "bladescodeservices@yahoo.com"; "mike@completetheloopcoalition.org"; "JoePitt@ctuir.org"; "LGloria@WenatcheeWA.Gov"; "krugani@kearnswest.com"; Angela Whelpley; "sbrawley@eastmontparks.com"; "cbrown@eastmontparks.com"; "AHessenius@kearnswest.com"; "mbday@kearnswest.com"; "adahlin@kearnswest.com"; "jdowning@kearnswest.com"; "pburgoon@g-o.com"; Emily Waters; Janel Ulrich; Kate Taylor; Michelle Smith; Nathalie Denis; Nuria Holmes; Fatima Oswald; "krussell@blm.gov"; "kkennedy@kearnswest.com"; Ray Heit
Subject:	RI Relicensing Draft Recreation Resources Inventory Study Plan - Comment Opportunity
Date:	Thursday, July 14, 2022 8:36:50 AM
Attachments:	image002.png

Good morning,

Here is the link to comment on the Rock Island Relicensing Draft Recreation Resources Inventory Study Plan. Click the link to access the document and submit your comments.

Comments are to be submitted by EOD Thursday, July 28.

Thank you for your participation.

Kate Taylor
Licensing & Compliance Specialist
Chelan PUD
[M] 509-899-5555
[W] 509-661-4410

Search Comment Items

Public Comment Form

Rock Island Relicensing Draft Recreation Resources Inventory Study Plan

Chelan County PUD invites stakeholders to provide comments on our draft study plan. Please review the document (click "Review Document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

Your Comment

Comments can be submitted through an attachment or provided directly in the space below.
Please submit by end of day on Thursday, July 28.

Review Document

Insert comments on Rock Island Relicensing Draft Recreation Resources Inventory Study Plan

Upload File

Uploading a file is optional

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment, please contact the person listed at the bottom of this page.

Continue »

Rock Island Relicensing Team

RIRelicensing@chelanpud.org

FINAL RECREATION RESOURCES INVENTORY REPORT

ROCK ISLAND HYDROELECTRIC PROJECT
FERC NO. 943

Source: Chelan PUD 2016

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

APRIL 2023

FINAL RECREATION RESOURCES INVENTORY REPORT

ROCK ISLAND HYDROELECTRIC PROJECT
FERC PROJECT NO. 943

Prepared for:

PUBLIC UTILITY NO. 1 OF CHELAN COUNTY
327 N. WENATCHEE AVENUE
WENATCHEE, WA 98801

Prepared by:

Kleinschmidt

APRIL 2023

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TERMS AND ABBREVIATIONS

ACLT	Apple Capital Loop Trail
ADA	Americans with Disabilities Act
Chelan PUD	Public Utility District No. 1 of Chelan County
CDLT	Chelan-Douglas Land Trust
CUP	Conditional Use Permit
CBRA	Crescent Bar Recreation Area
FERC	Federal Energy Regulatory Commission
GPS	Global Positioning System
ILP	Integrated Licensing Process
MOU	Memorandum of Understanding
PAD	Pre-Application Document
Rock Island Project	Rock Island Hydroelectric Project
Rocky Reach Project	Rocky Reach Hydroelectric Project
RV	Recreational Vehicle
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRPC	Wenatchee Row and Paddle Club

1.0 INTRODUCTION

Public Utility District No. 1 of Chelan County (Chelan PUD) is the licensee, owner, and operator of the Rock Island Hydroelectric Project (Rock Island Project) Federal Energy Regulatory Commission (FERC) Project No. 943. The Project is located on the Columbia River in Douglas and Chelan counties, with the Rock Island Dam and associated powerhouses located approximately 12 miles south of Wenatchee, Washington. Chelan PUD operates the Project under a 40-year license issued by FERC on January 19, 1989; the current license will expire on December 31, 2028.

Chelan PUD initiated informal, early engagement for the relicensing of the Rock Island Project, prior to the initiation of the more formal Integrated Licensing Process (ILP). As part of this informal, early engagement, Chelan PUD conducted this Recreation Resources Inventory from August 8 through 12, 2022, and intends to integrate the findings of this inventory into the Pre-Application Document (PAD), which will be filed with FERC and distributed to relicensing participants when the ILP commences in late 2023.

2.0 STUDY GOALS AND OBJECTIVES

2.1 Study Goals

The goals of the 2022 Recreation Resources Inventory are to:

- Inventory existing FERC-approved recreation sites identified in the Rock Island Project Recreation Plan (i.e., Exhibit R of the current FERC license);
- Provide general documentation of non-Rock Island Project recreation sites that are not regulated by FERC under the Rock Island Project Recreation Plan but are within the Rock Island Project Boundary; and
- For the purposes of identifying comparable recreation opportunities near the Rock Island Project, identify developed public recreation sites and facilities within the general vicinity (i.e., approximately a 1-hour drive or up to 60 miles) of the Rock Island Project.

2.2 Study Objectives

Study Objectives for the 2022 Recreation Resources Inventory include:

- Field-verify, map, and document FERC-approved Rock Island Project recreation sites that are part of the Recreation Plan for the Rock Island Project;
    - Document the general condition of FERC-approved Rock Island Project recreational sites that are part of the Recreation Plan and describe their maintenance, inspection, and/or management practices;
- Field-verify, map, and document public recreation sites and facilities that are not part of the FERC-approved Recreation Plan for the Rock Island Project, but are within the Rock Island Project Boundary; and
- Identify recreation sites within the general vicinity of the Rock Island Project that provide comparable recreation opportunities as the sites identified in the FERC-approved Rock Island Project Recreation Plan.

3.0 GEOGRAPHIC SCOPE

The geographic scope for this study was divided into the following categories:

- FERC-approved recreation sites and facilities identified in the Rock Island Project Recreation Plan (Figure 3-1);
- Non-Rock Island Project publicly available recreation sites within the Rock Island Project Boundary (Figure 3-2); and
- Publicly available recreation sites within the general vicinity (i.e., approximately a 1-hour drive or up to 60 miles) of the Rock Island Project (Figure 3-3 and Figure 3-4) that provide comparable recreation opportunities as the sites identified in the FERC-approved Rock Island Project Recreation Plan.

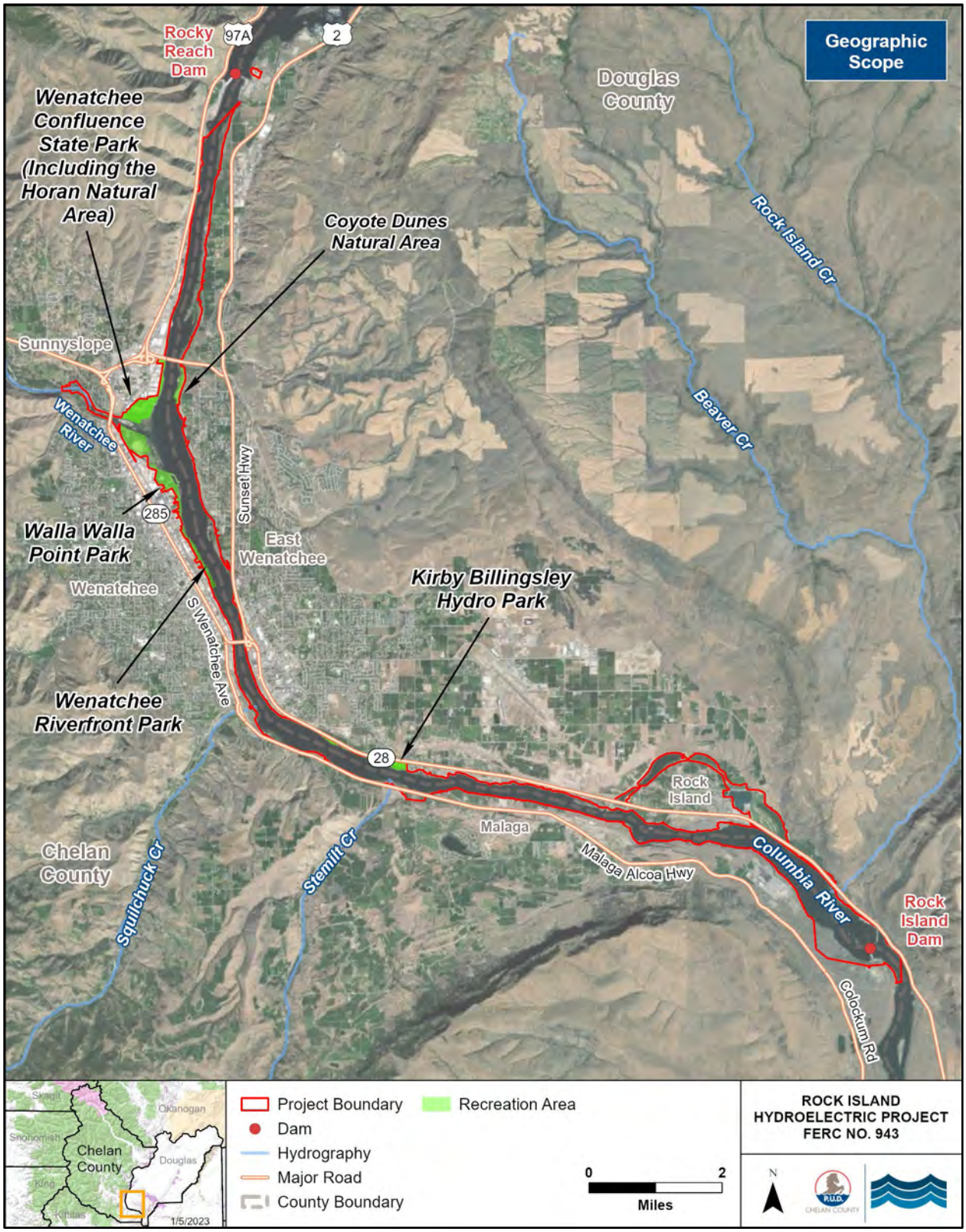

Figure 3-1 FERC-Approved Recreation Sites in the Rock Island Project Recreation Plan

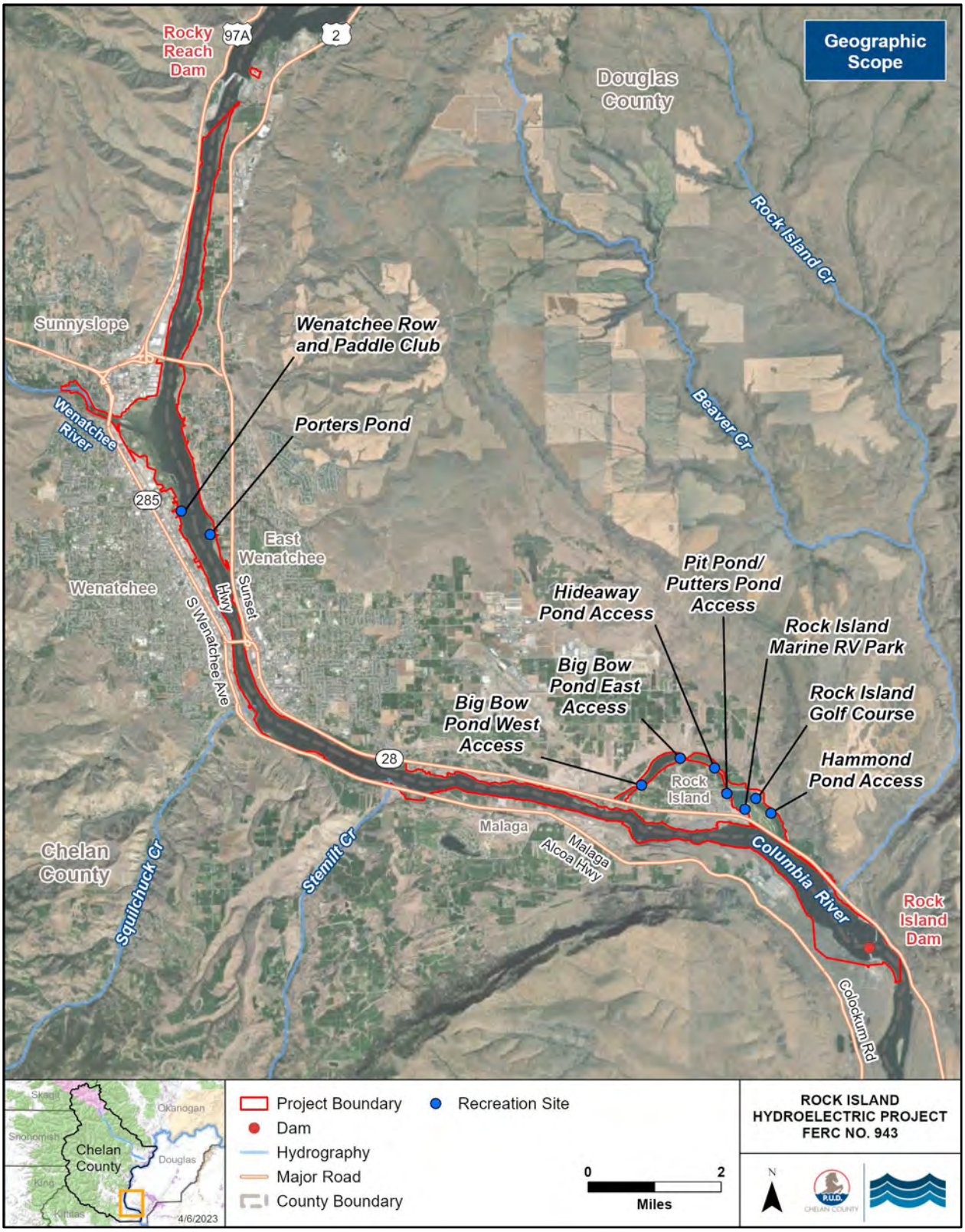

Figure 3-2 Non-Rock Island Project Public Recreation Sites within the Rock Island Project Boundary

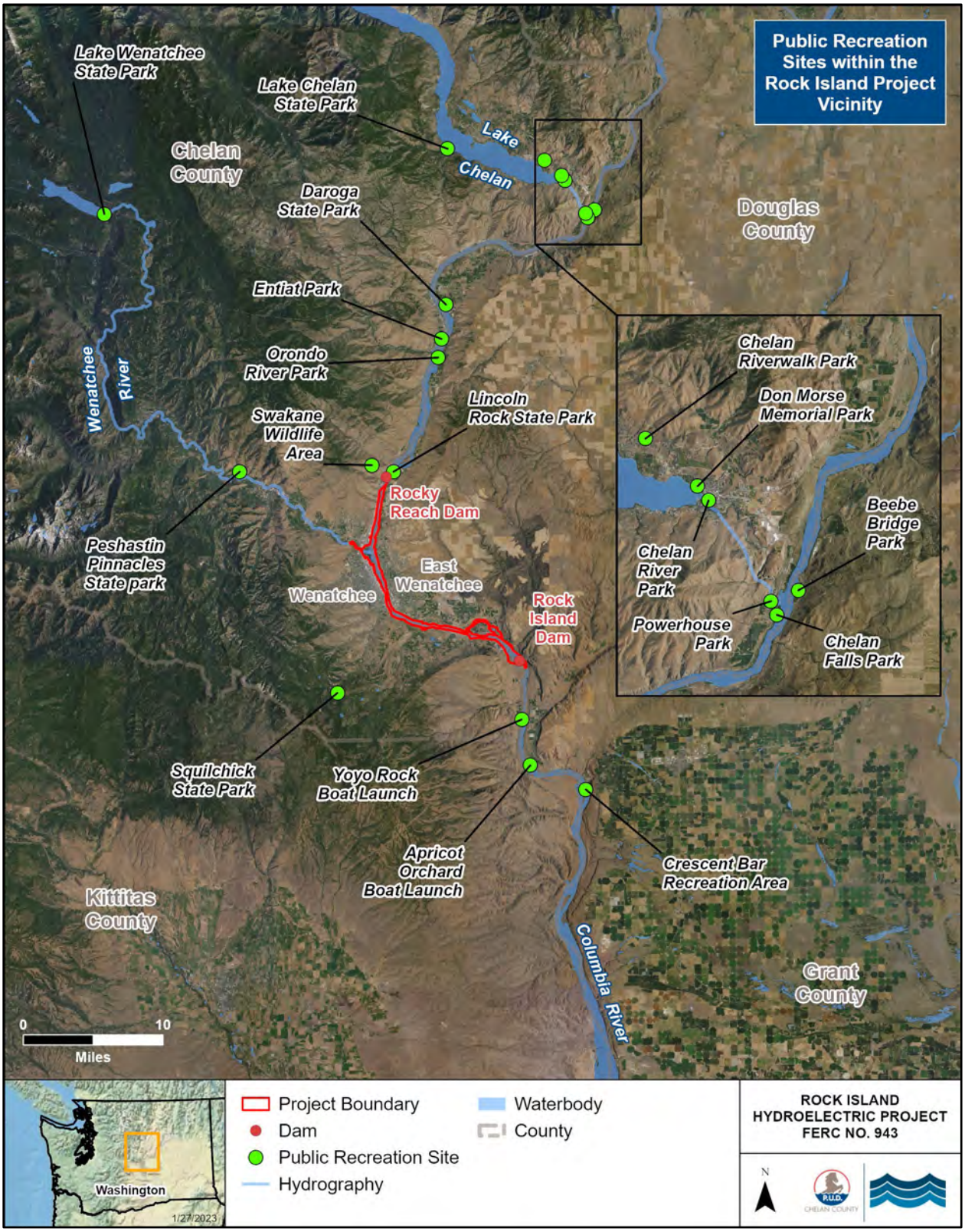

Figure 3-3 Public Recreation Areas within the Rock Island Project Vicinity

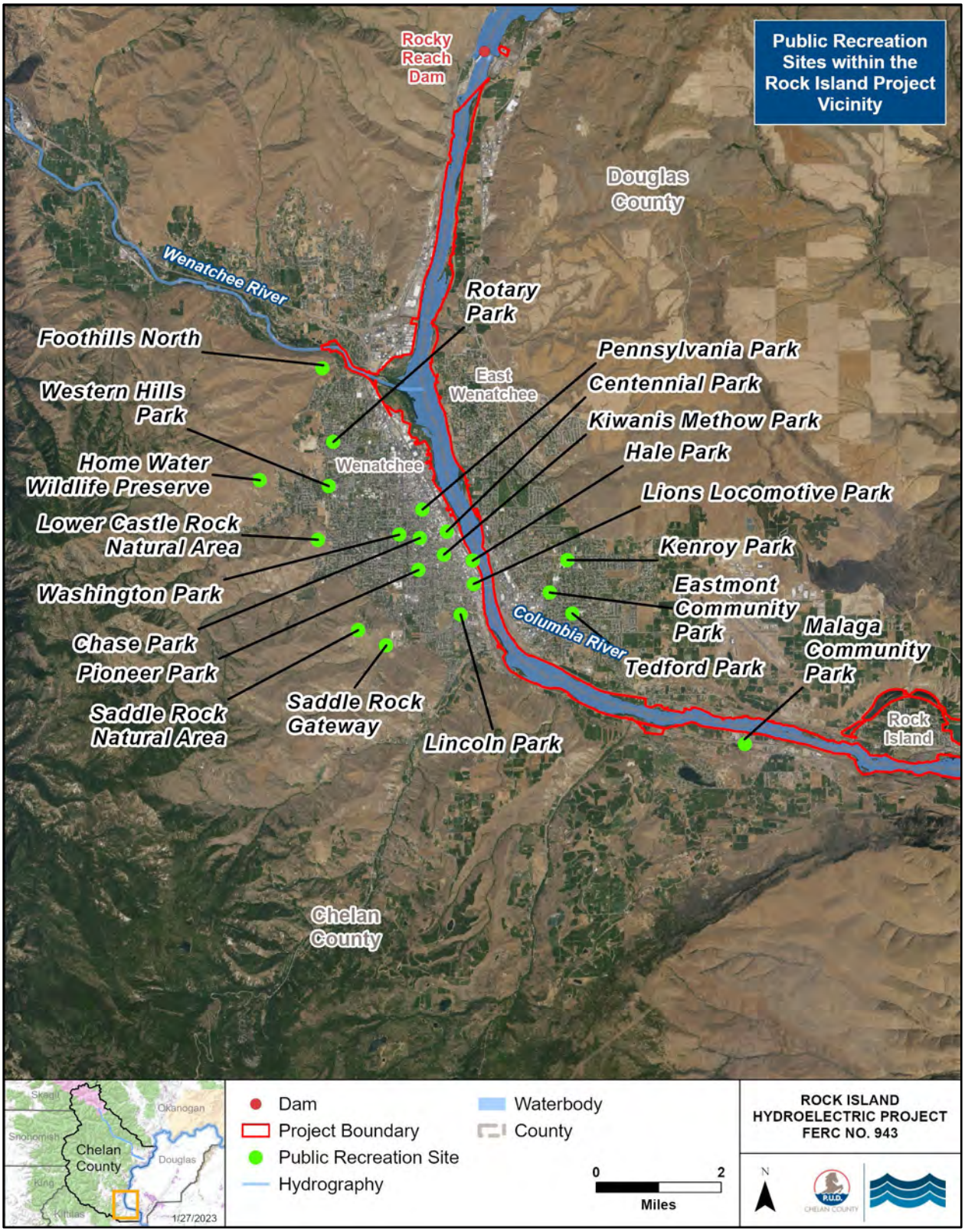

Figure 3-4 Public Recreation Areas within the Rock Island Project Vicinity (Wenatchee and East Wenatchee Detail)

4.0 STUDY METHODOLOGY

4.1 Field Surveys

Field surveys were conducted at public recreation sites, from August 8 through 12, 2022, including both FERC-approved and other public recreation sites, located within the Rock Island Project Boundary. Information collected during field surveys was documented on the Recreation Site Inventory Form (Appendix A). Information that was collected included the following:

FERC-Approved Recreation Sites Identified in the Rock Island Project Recreation Plan

- Global positioning system (GPS) location of the facilities;
- Type, number, and condition of amenities provided at each site;
- An estimate of parking capacity;
- Ownership and management;
- Hours/seasons of operation;
- Existing safety, security, and informational (signage) measures;
- Observations of site use and accessibility;
- Suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities; and
- Representative photographs.

Non-Rock Island Project Recreation Sites within the Rock Island Project Boundary

- GPS location of the facilities;
- General description of amenities provided at each site;
- Existing informational signage; and
- Representative photographs.

4.2 Desktop Review

Information pertaining to existing public recreation sites were identified through a desktop review of publicly available recreation sites within the general vicinity (i.e., approximately a 1-hour drive or up to 60 miles) of the Rock Island Project as defined in Section 3.0 - Geographic Scope. Information sources for this assessment included relevant local, state, and federal recreation plans, recreation guidebooks, maps, tourist information, magazine articles, online descriptions of

recreation opportunities and trips, and fishing regulations. This assessment also included review of existing comprehensive management plans applicable to the Rock Island Project.

5.0 RESULTS

Following are the results of the recreation resources inventory, including information pertaining to public recreation sites within the Rock Island Project Boundary, and a summary of the recreation sites within the general vicinity of the Rock Island Project (i.e., approximately a 1-hour drive or up to 60 miles).

5.1 FERC-Approved Recreation Sites Identified in the Rock Island Project Recreation Plan

Field surveys were conducted at FERC-approved recreation sites identified in the Rock Island Project Recreation Plan as indicated in Section 4.0 - Study Methodology. Information collected during field surveys was documented on a Recreation Site Inventory Form (Appendix A). Table 5-1 gives a summary of the recreation sites and amenities identified during the field surveys within the FERC-approved recreation sites.

Table 5-1 Rock Island Project Recreation Facilities

RECREATION SITE NAME	RECREATION AMENITIES
Wenatchee Confluence State Park	2 picnic shelters 1 sports court 1 sports field 7 restrooms 1 designated group campsite area 59 designated campsite areas 1 designated swim area 1 fishing pier/platform 1 gravel hiking/walking trail 1 paved hiking/walking/biking trail 1 boat launch access (2 boat launch lanes) 11 Interpretive signage 3 Interpretive Kiosks 5 parking lots 2 playgrounds
Walla Walla Point Park	2 picnic shelters 3 sports courts 4 sports fields 4 restrooms 1 paved hiking/walking/biking trail 1 designated swim area 1 playground 4 parking lots

RECREATION SITE NAME	RECREATION AMENITIES
Wenatchee Riverfront Park	2 restrooms 1 day use moorage 1 paved hiking/walking/biking trail 1 boat launch access (2 boat launch lanes) 6 parking lots
Kirby Billingsley Hydro Park	1 picnic shelter 2 sports courts 3 sports fields 1 paved hiking/walking/biking trail 3 restrooms 1 designated swim area 1 boat launch access (2 boat launch lanes) 1 fishing pier/platform 8 parking lots
Coyote Dunes Natural Area	Interpretive signage (described in the Final Coyote Dunes Natural Area Management Plan) 1 natural surface trail system

The following sections summarize current Rock Island Project recreation sites and facilities.

5.1.1 Wenatchee Confluence State Park

Wenatchee Confluence State Park sits at the confluence of the Wenatchee and Columbia Rivers, approximately 17 miles north of the Rock Island Dam. The park is comprised of Wenatchee Confluence State Park North (Figure 5-1 and Figure 5-2) and Wenatchee Confluence State Park South (Figure 5-3), which are connected by the Apple Capital Loop Trail (ACLT)[1] Bridge, a pedestrian footbridge over the Wenatchee River. The park is accessible to vehicles via Old Station Road, a two-lane paved road. The park is accessible to pedestrians and bicyclists via the ACLT, and to boaters via the boat launch and dock. Chelan PUD owns the site, and Washington State Parks manages the site. The day use areas of the park are operated from dawn until dusk, year-round; operational times may vary seasonally. The campground area of the park remains open overnight.

[1] The ACLT is a 10-mile long picturesque loop along the east and west shores of the Columbia River in the Wenatchee and East Wenatchee areas. It is well used for walking, jogging, skating and riding bicycles. The ACLT is a series of connecting pedestrian and bicycle paths that is co-owned and co-managed by Chelan PUD, the City of Wenatchee, Washington State Department of Transportation, Douglas County, and the Washington State Parks and Recreation Commission. The ACLT meanders both inside and outside of the Rock Island Project Boundary. Chelan PUD owns and operates only the segments of the ACLT that are within the Rock Island Project FERC-approved recreation sites.

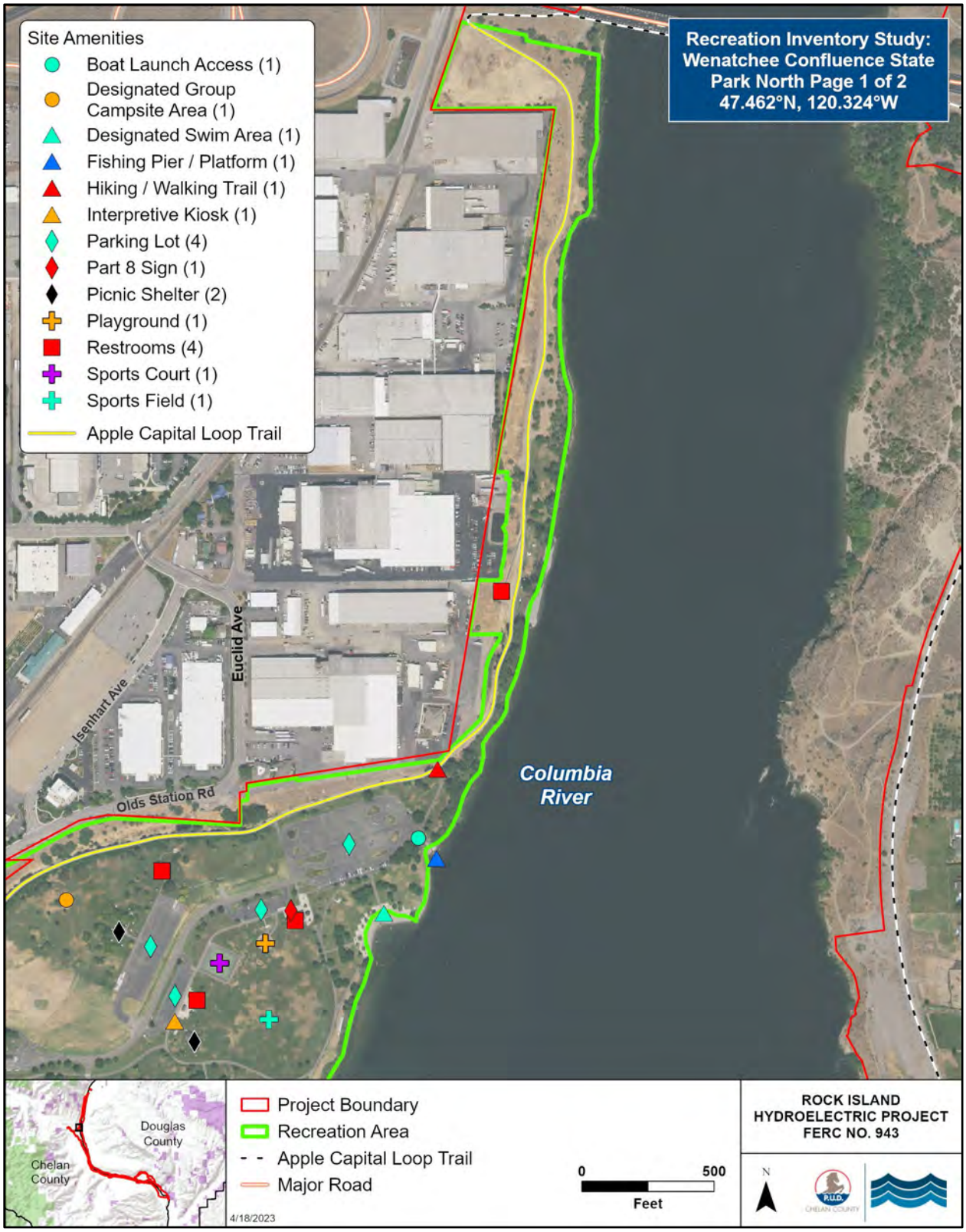

Figure 5-1 Wenatchee Confluence State Park North (1 of 2)

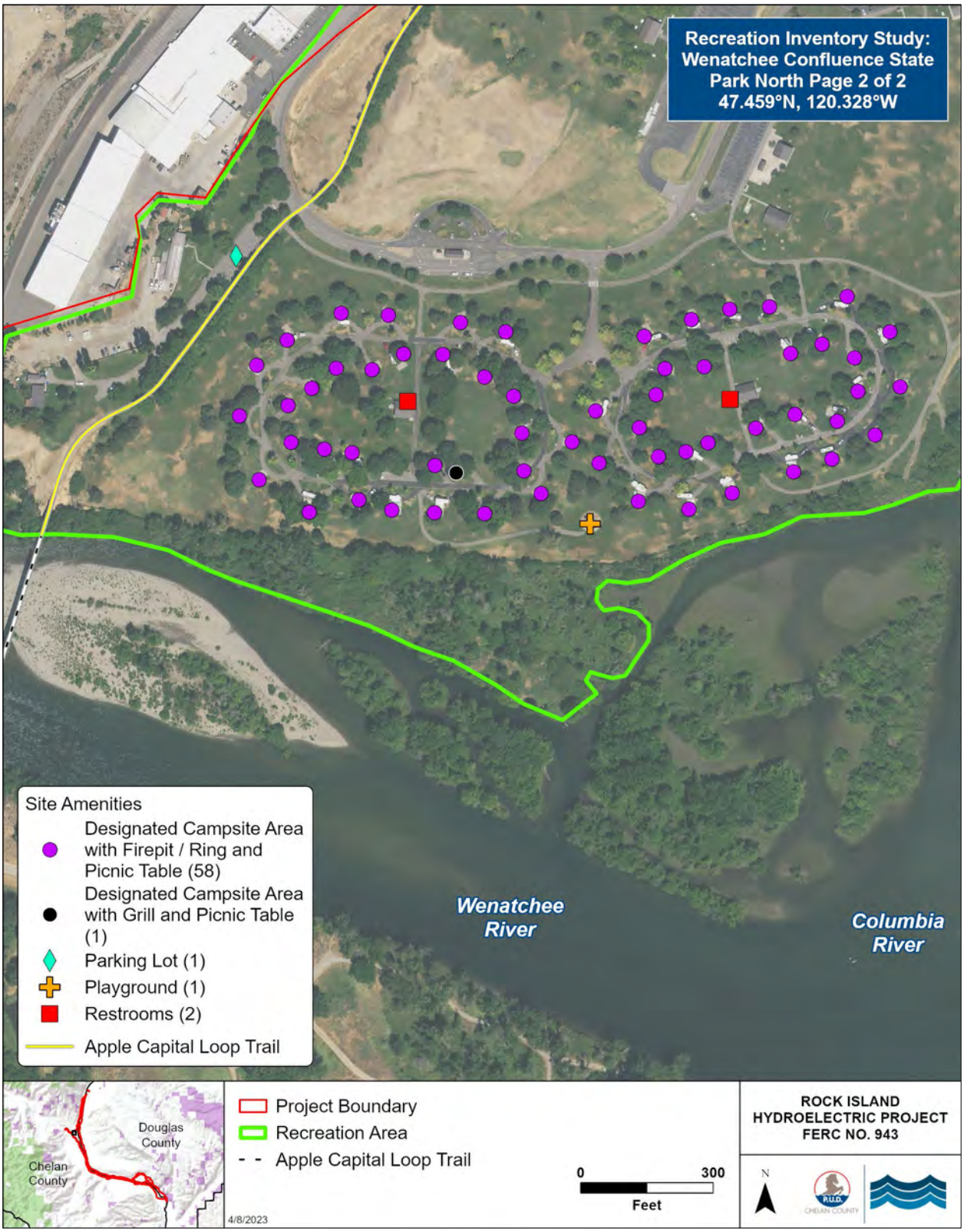

Figure 5-2 Wenatchee Confluence State Park North (2 of 2)

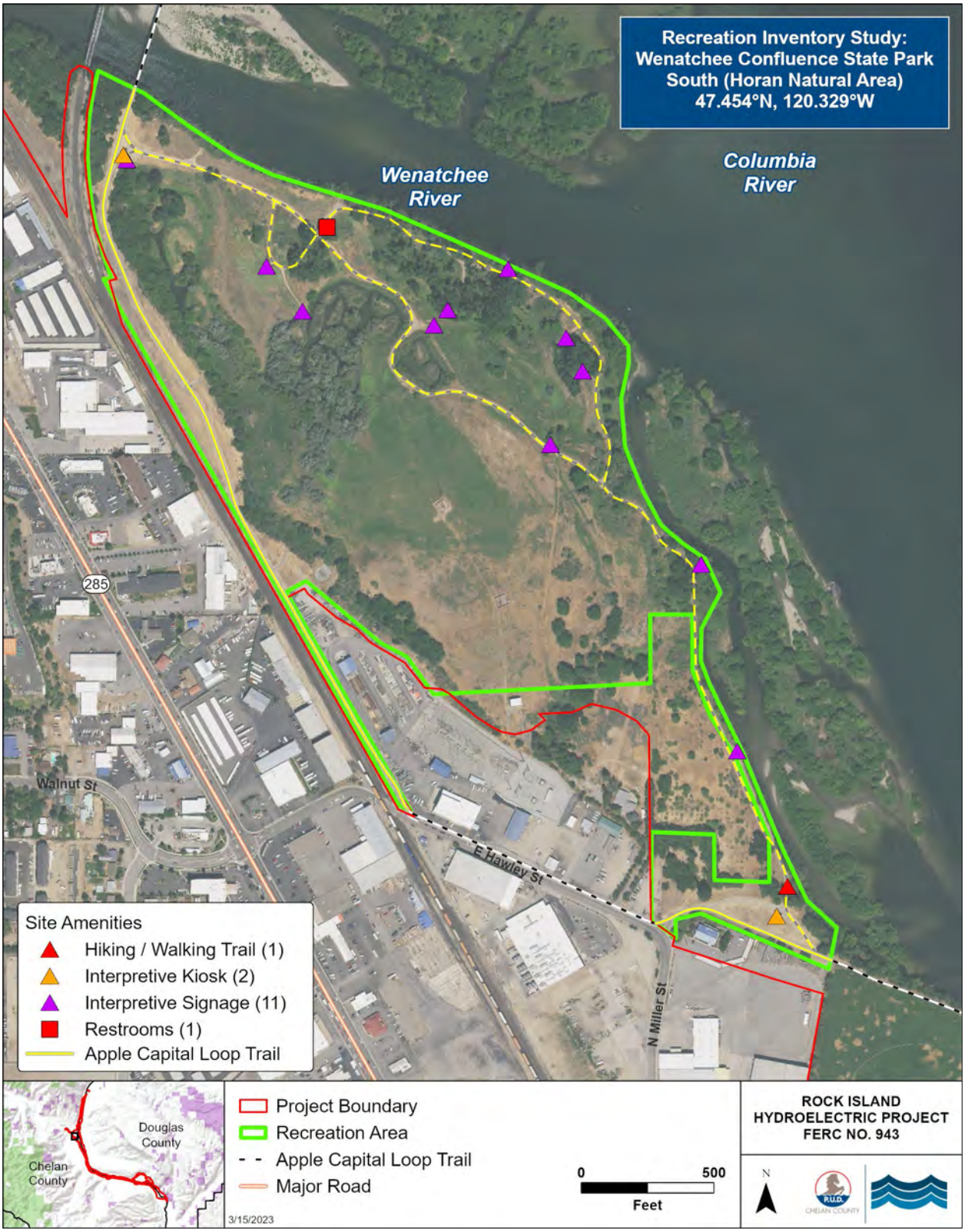

Figure 5-3 Wenatchee Confluence State Park South (Horan Natural Area)

5.1.1.1 Wenatchee Confluence State Park North

Wenatchee Confluence State Park North (Figure 5-1 and Figure 5-2) requires a fee and primarily consists of a designated campground, hard-surface two-lane boat launch and prep area, swimming area, and multiple picnic facilities including grills. The ACLT runs through the park for approximately 1.95 miles, which allows for foot-traffic and cycling (Photo 5-1 and Photo 5-2). Fishing is allowed during open season. The campground consists of eight standard campsites and 51 full-hookup recreational vehicle (RV) sites, one group site, and a dump station. All sites have a picnic table and a firepit/ring. Visitors have access to restrooms, benches, water fountains, bike racks, and trash receptables. Restrooms include urinals for the men, and Americans with Disabilities Act (ADA) compliant flush toilets and showers stalls for both men and women. A sports field is available for activities such as football, baseball, and rugby with goal posts. A sports court within the park include tennis (Photo 5-3)and basketball. For added recreation, the park provides volleyball courts, horseshoe pits, picnic shelters (Photo 5-4) and an ADA compliant playground. There is parking for approximately 176 vehicles with trailers, 72 without trailers, and 11 ADA parking spots within five lots. The ACLT is in good condition and is ADA accessible throughout the park. There are signs marking boating safety, Rock Island Project information, pet policies, Washington State Park access pass options, and bicycling rules, in both English and Spanish. Restrooms, benches, picnic tables, grills, trash receptables, and water fountains provided are suitable for persons with disabilities to participate in recreation opportunities. Overall, the site was observed to be in good condition and is functioning as intended. No evidence of vegetation impacts or erosion were observed, however there is a known erosion site for which treatment is being planned.

Source: Kleinschmidt 2022

Photo 5-1 Apple Capital Loop Trail within Wenatchee Confluence State Park

Source: Kleinschmidt 2022

Photo 5-2 Wenatchee Confluence State Park Bench, Educational Signage and Viewing Area

Source: Kleinschmidt 2022

Photo 5-3 Wenatchee Confluence State Park Sports Court

Source: Kleinschmidt 2022

Photo 5-4 Wenatchee Confluence State Park Picnic Shelter

5.1.1.2 Wenatchee Confluence State Park South

Wenatchee Confluence State Park South (Figure 5-3) consists of the Horan Natural Area, which is regularly patrolled by Washington State Park staff, who also perform periodic maintenance, as necessary. There is no fee required to visit the Horan Natural Area. There is no designated parking area for this site, but it is accessible via the ACLT at two entrance points, one to the north and one to the south. There is a parking area near the entrance of Wenatchee Confluence State Park North that is available for recreationists to use and walk to the Horan Natural Area via the ACLT pedestrian bridge that spans the Wenatchee River. Recreationists can also park at Walla Walla Point Park and walk to the Horan Natural Area via the ACLT. The Horan Nature Trail, approximately 1.35 miles in Wenatchee Confluence South, is a gravel trail that offshoots from the ACLT and loops around the Horan Natural Area (Photo 5-5). Bicycle racks are available for use, but bicycles are prohibited on the pedestrian-only Horan Nature Trail. Visitors have access to an ADA compliant pit toilet restroom, trash receptacles, benches, and nature viewing areas (Photo 5-6 and Photo 5-7). There are several signs providing interpretive and safety content. Overall, the site is in good condition and is functioning as intended. No evidence of vegetation impacts or erosion were observed.

Source: Kleinschmidt 2022

Photo 5-5 Wenatchee Confluence State Park Horan Nature Trail

Source: Kleinschmidt 2022

Photo 5-6 Horan Natural Area Interpretive Kiosk

Source: Kleinschmidt 2022

Photo 5-7 Horan Natural Area Interpretive Sign

5.1.2 Walla Walla Point Park

The ACLT continues south from Wenatchee Confluence South along the west side of the Columbia River into Walla Walla Point Park (Figure 5-4). The ACLT within Walla Wall Point Park is approximately 1.2 miles long. The site is also accessible to vehicles via Walla Walla Avenue, a two-lane paved road, as well as via stairs and a path from a nearby hotel and its parking area. Chelan PUD owns and manages the site, which operates from dawn until dusk, year-round; operational times may vary seasonally and requires no fee. Walla Walla Point Park primarily consists of a multi-sport field complex that is lit providing for a multitude of sporting events such as softball, baseball, soccer, football and lacrosse. There are also several picnic areas, a scenic overlook, a pet relief area, and a sandy beach with a designated swim area (Photo 5-8). Picnic areas within the park provide electricity, water, and sinks. Visitors have access to picnic tables, benches, trash receptacles, water fountains, and grills. Restrooms include urinals for the men, and ADA compliant flush toilets for both men and women. Sports courts are available for basketball, pickleball, and handball. There are also two volleyball courts available for recreationists. An ADA compliant playground, and adult fitness stations are also available for use and in adequate condition. There are safety, informational, and educational signs throughout the site in English and Spanish. Benches, multi-use sports fields and courts (Photo 5-9 and Photo 5-10), water fountains, restrooms, picnic facilities, and trash receptacles provided are suitable for persons with disabilities to participate in recreation opportunities. There are art installations throughout the park (Photo 5-11). There is parking for approximately 420 vehicles without trailers and 18 ADA vehicles within the four lots. Overall, the site is in good condition and functioning as intended. No evidence of vegetation impacts or erosion were observed.

Figure 5-4 Walla Walla Point Park

Source: Kleinschmidt 2022

Photo 5-8 Walla Walla Point Park Designated Swim Area

Source: Kleinschmidt 2022

Photo 5-9 Walla Walla Point Park Multi-Sport Field Complex

Source: Kleinschmidt 2022

Photo 5-10 Walla Walla Point Park Sports Courts

Source: Kleinschmidt 2022

Photo 5-11 Walla Walla Point Park Cultural Art Installation

5.1.3 Wenatchee Riverfront Park

The ACLT continues south from Walla Walla Point Park along the west side of the Columbia River into Wenatchee Riverfront Park (Figure 5-5). The ACLT within Wenatchee Riverfront Park is approximately 1.1 miles long. The site is accessible to vehicles via Riverside Drive, and the entrance consists of a two-lane paved road. Chelan PUD owns and manages the site, which operates from dawn until dusk, year-round; operational times may vary seasonally and this site requires no fee. The Wenatchee Riverfront Park primarily consists of an interactive art and garden walk along the ACLT (Photo 5-12), as well as several picnic areas and a boat launch. A boat dock is accessible alongside the boat launch (Photo 5-13). There is also a day use boat moorage dock just upstream from the boat launch parking area. The park includes a special event mini railroad featuring a locomotive display, railroad interpretive sign, and steam train demonstration (not managed by Chelan PUD). Visitors have access to picnic tables, benches, trash receptacles and water fountains. Restrooms include urinals for the men, and ADA compliant flush toilets for both men and women. There is parking for approximately 20 vehicles with trailers, 156 without trailers, and four ADA vehicles within five lots. Bike racks are available within the park as well. There are signs marking the information about the garden, park rules and regulations (including Part 8 details),[2] and safety information in both English and Spanish. Benches, water fountains, bike racks, picnic facilities, and trash receptacles provided are suitable for persons with disabilities to participate in recreation opportunities. Overall, the site is in good condition and is functioning as intended. No evidence of vegetation impacts or erosion were observed.

[2] 18 CFR § 8.2 Posting of project lands as to recreational use and availability of information https://www.ecfr.gov/current/title-18/chapter-I/subchapter-B/part-8/section-8.2.

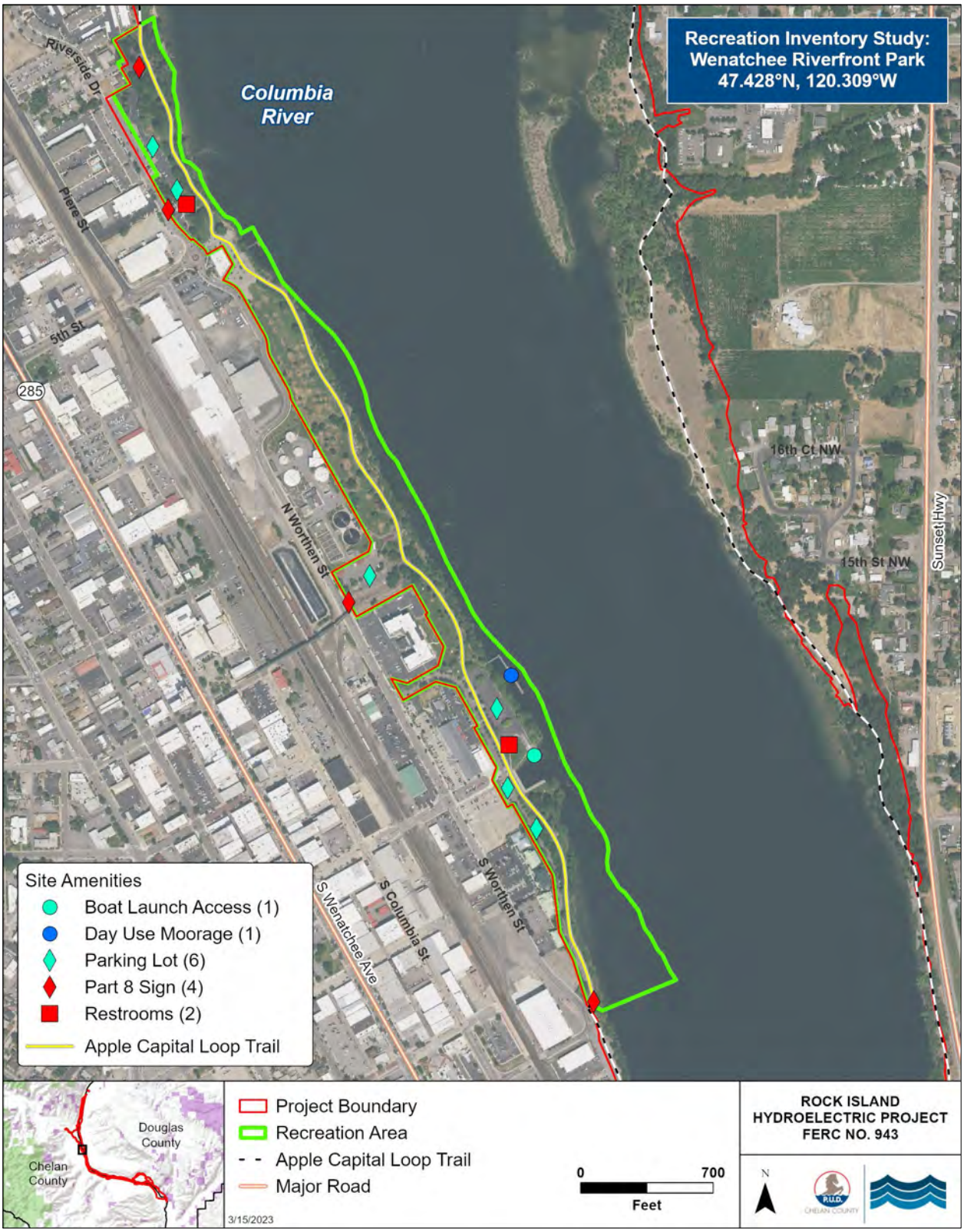

Figure 5-5 Wenatchee Riverfront Park

Source: Kleinschmidt 2022

Photo 5-12 Wenatchee Riverfront Park Informational Signage of Xeriscape Demonstration Garden

Source: Chelan PUD 2016

Photo 5-13 Wenatchee Riverfront Park Boat Launch and Dock

5.1.4 Kirby Billingsley Hydro Park

Kirby Billingsley Hydro Park (Figure 5-6 and Figure 5-7) is located on the east side of the Columbia River. The park is accessible to vehicles via a two-lane paved road and a pedestrian and bicycle trail extension from the ACLT to the north side of the site. Chelan PUD does not manage the trail extension. Chelan PUD owns and manages the site, which operates dawn until dusk, year-round; operational times may vary seasonally. The site primarily consists of a two-lane boat launch (Photo 5-14), picnic areas, sports courts that consist of tennis, basketball and volleyball, multi-use lighted sports fields with benches, and a sandy beach with a swimming area (Photo 5-15). Visitors have access to benches, grills, bleachers, picnic tables, and water fountains. Restrooms include urinals for the men, and ADA compliant flush toilets for both men and women. There is parking for approximately 33 vehicles with trailers, 244 without trailers, and six ADA vehicles. There are signs marking park information, history and directions, Part 8 information, safety, and beach rules in both English and Spanish (Photo 5-16). Benches, signage kiosks, picnic shelters, sports fields, water fountains, and trash receptacles provided are suitable for persons with disabilities to participate in recreation opportunities. Overall, the site is in good condition and functioning as intended. No evidence of vegetation impacts or erosion were observed.

Figure 5-6 Kirby Billingsley Hydro Park (1 of 2)

Figure 5-7 Kirby Billingsley Hydro Park (2 of 2)

Source: Kleinschmidt 2022

Photo 5-14 Kirby Billingsley Hydro Park Two Lane Boat Launch

Source: Kleinschmidt 2022

Photo 5-15 Kirby Billingsley Hydro Park Designated Swim Area

Source: Kleinschmidt 2022

Photo 5-16 Kirby Billingsley Hydro Park Part 8 Sign

5.1.5 Coyote Dunes Natural Area

The Coyote Dunes Natural Area (Figure 5-8) is located on the east side of the Columbia River, approximately 17 miles north of the Rock Island Dam. The site operates as a designated natural trail system with informational and safety signage in English and Spanish and a river viewing area (Photo 5-17 and Photo 5-18). The trail system is comprised of a total of 1.2-miles of authorized trails. Authorized trails provide a connection(s) to the Apple Capital Loop Trail and Washington Department of Natural Resources (WDNR) property along reservoir. The site is accessible via the ACLT. Chelan PUD owns and manages the site, which operates from dawn until dusk, year-round; operational times may vary seasonally. Overall, the site is in good condition and is functioning as intended. No evidence of vegetation impacts or erosion were observed.

On March 15, 2023, FERC approved the Coyote Dunes Natural Area Management Plan, which describes measures to protect and preserve unique habitats, cultural resources, sensitive species and provide passive public recreation opportunities (i.e., walking trails and interpretive and public safety signage).

Figure 5-8 Coyote Dunes Natural Area

Source: Kleinschmidt 2022

Photo 5-17 Coyote Dunes Natural Area Trail

Source: Kleinschmidt 2022

Photo 5-18 Coyote Dunes Natural Area River Viewing Area

5.2 Non-Rock Island Project Public Recreation Sites within the Rock Island Project Boundary

Along with the five Rock Island Project recreation sites that are FERC-approved under the Rock Island Project Recreation Plan and discussed in section 5.1 above, there are numerous non-Project public recreation opportunities for the public to enjoy (Figure 3-2) within the Rock Island Project Boundary. The following sections summarize the additional non-Rock Island Project recreation opportunities within the Rock Island Project Boundary that are not part of the FERC-approved Recreation Plan.

5.2.1 Apple Capital Loop Trail

The 10-mile ACLT (Figure 5-9 and Photo 5-19) is a series of connecting pedestrian and bicycle paths that is co-owned and co-managed by Chelan PUD, the city of Wenatchee, WSDOT, Douglas County, and the Washington State Parks and Recreation Commission. Chelan PUD owns and operates only the portions of the ACLT that are within the Rock Island Project FERC-approved recreation sites.

Mile marker 1 of the ACLT is located in the Chelan-managed portion of the ACLT where Worthen Street and Orondo Avenue intersect in front of the Pybus Public Market. Recreationists can travel the loop in either direction. Heading northwest, the ACLT proceeds through Wenatchee Riverfront Park and onto Walla Walla Point Park (at mile marker 2). Consistent with the current Rock Island Project license, Chelan PUD manages both the 1.1-mile portion of the ACLT in Wenatchee Riverfront Park, and a 1.2-mile portion in Walla Walla Point Park.

Prior to mile marker 3, the ACLT enters Wenatchee Confluence State Park and is managed by the Washington State Parks and Recreation Commission. As noted above, consistent with the current Rock Island Project license, Washington State Parks, through an agreement with Chelan PUD, manages the 1.95-mile portion of the trail in this park. Between mile markers 5 and 6, recreationists cross over the Richard Odabashian Bridge, managed by the WSDOT.

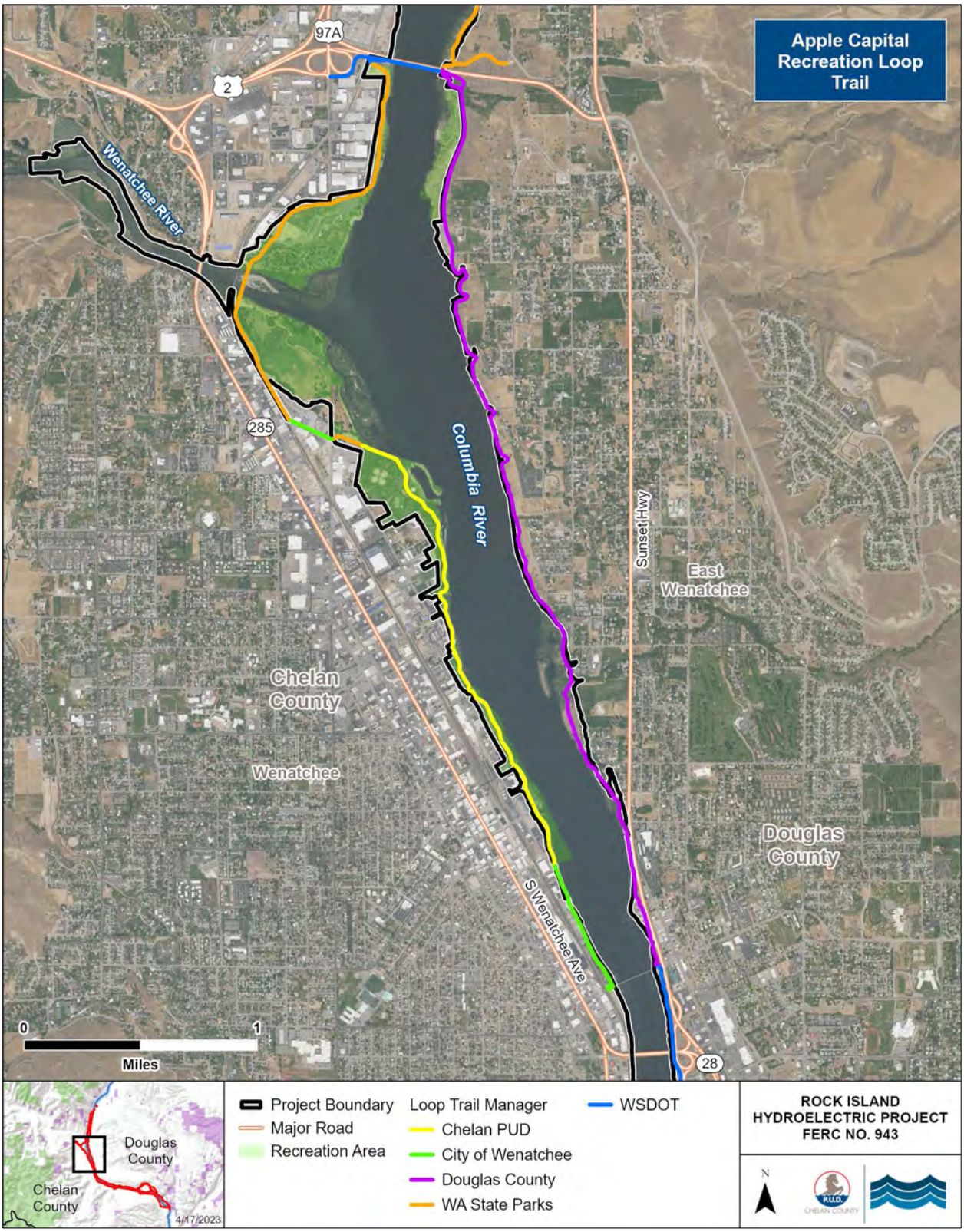

Figure 5-9 Apple Capital Loop Trail Map with Management Details

Source: Kleinschmidt Associates 2021

Photo 5-19 Apple Capital Loop Trail Looking Southeast

Heading southeast, recreationists continue the loop on the east side of the Columbia River, near East Wenatchee. From mile marker 6 to approximately mile marker 10, the ACLT is managed by Douglas County. The ACLT continues back towards the Hale Park/Dog Park on the west side of Wenatchee, where recreationists pass by another portion of the loop managed by the city of Wenatchee, before reconnecting with the Riverfront Park portion of the ACLT.

Chelan PUD encourages trail etiquette to ensure public safety on the Chelan PUD portions of ACLT. The park and trail etiquette information are published on the Chelan PUD Parks and Recreation website, and features trail tips and videos.

5.2.1.1 Additions to the Apple Capital Loop Trail

The Rocky Reach Trail is a 5-mile paved, mixed-use, ADA-accessible trail that begins at Lincoln Rock State Park near Rocky Reach Dam and ties into the ACLT near mile marker 6 and Coyote Dunes Natural Area. It is currently managed by Washington State Parks and Recreation Commission. Additionally, a 1-mile portion of the Rocky Reach Trail (from Lincoln Rock State Park) lies within the Rocky Reach FERC Project Boundary and is maintained under contract by Washington State Parks and Recreation Commission.

Beginning at the westerly extent of Chelan PUD's Kirby Billingsley Hydro Park, an additional 2.2-mile trail extends northward along the river and ties into the ACLT at Old Wenatchee Bridge, a

pedestrian bridge located just upstream of the George Sellar Bridge. This portion of trail is managed by WSDOT.

5.2.2 Wenatchee Row and Paddle Club

The Wenatchee Row and Paddle Club (WRPC) own and maintain a non-motorized boat launch with access to the Columbia River within Walla Walla Point Park, which is open to the public (Figure 5-10 and Photo 5-20). The WRPC maintain a boathouse within Walla Walla Point Park, which is available to its members for storage or access to over 25 club-owned boats (WRPC 2022).

Figure 5-10 Wenatchee Row and Paddle Club

Source: Kleinschmidt 2022

Photo 5-20 Wenatchee Row and Paddle Club Non-Motorized Boat Launch

5.2.3 Porters Pond

Porters Pond (Figure 5-11), as referred to by the local community, is an area of the Columbia River that creates a small pond of calm water on the east shoreline of the reservoir. Porters Pond is owned and managed by the city of East Wenatchee and WDNR. There is an informational kiosk located at the site where it connects to the ACLT. Several foot paths provide access to the water. A sitting area (Photo 5-21) is provided away from the water that is accessible from a footpath near the ACLT.

Figure 5-11 Porters Pond

Source: Kleinschmidt 2022

Photo 5-21 Porters Pond Sitting Area

5.2.4 Big Bow Pond

Big Bow Pond (Figure 5-12) has two access points at the east and west ends of the lake. Chelan PUD owns the property at both access points. The sites are co-maintained by Chelan PUD and the city of Rock Island, however there is no official agreement or financial assistance between Chelan PUD and the city of Rock Island in place for this work. Big Bow Pond East access on the northeast side of the pond via Center Street is available via an unpaved entrance with two lanes. Visitors have access to a trash receptacle, one portable restroom, a concrete non-motorized boat launch, and informational signage (Photo 5-22). The site is available year-round. An unpaved gravel lot allows parking for approximately 15 vehicles. Big Bow Pond West access is available on the southwest side of the pond via Rock Island Road with a two-lane paved entrance. Visitors have access to a trash receptacle, one portable restroom, a gravel surfaced non-motorized boat launch, and informational signage (Photo 5-23). An unpaved gravel lot allows parking for approximately 12 vehicles. The site is available year-round.

Figure 5-12 Big Bow Pond East and West Access

Source: Kleinschmidt 2022

Photo 5-22 Big Bow Pond East Access Concrete Non-Motorized Boat Launch

Source: Kleinschmidt 2022

Photo 5-23 Big Bow Pond West Access Gravel Surfaced Non-Motorized Boat Launch

5.2.5 Hideaway Pond Access

Hideaway Pond (Figure 5-13) has one access point on the east end of the lake. Chelan PUD owns the pond access site (Photo 5-24) and Douglas County owns the access road and parking lot. The site is managed by Chelan PUD and Douglas County, with city of Rock Island involvement, however there is no official agreement or financial assistance between Chelan PUD and the city of Rock Island in place for this work. Access to the pond is available via Idaho Avenue via an unpaved two-lane gravel entrance. Visitors have access to a trash receptacle, a gravel surfaced non-motorized boat launch, and one portable restroom. A gravel parking lot allows for approximately 12 vehicles. The site is available year-round.

Figure 5-13 Hideaway Pond Access Area

Source: Kleinschmidt 2022

Photo 5-24 Hideaway Pond Access Gravel Surfaced Non-Motorized Boat Launch

5.2.6 Pit Pond/Putters Pond Access

Pit Pond and Putters Pond (Figure 5-14) are accessible via an unpaved extended entrance on the northwest shoreline with two lanes that run between the two ponds via Saunders Avenue. The site is owned and managed by the city of Rock Island. The site consists of water access for non-motorized boats, informational signage, a trash receptacle, and four portable restroom facilities (Photo 5-25 and Photo 5-26). Visitors have access to this site year-round.

Figure 5-14 Pit Pond/Putters Pond Access Area

Source: Kleinschmidt 2022

Photo 5-25 Pit Pond Access Area Road

Source: Kleinschmidt 2022

Photo 5-26 Putters Pond Access Area View from Road

5.2.7 Rock Island Golf Course

The Rock Island Golf Course (Figure 5-15 and Photo 5-27) is located southeast of Putters Pond. The golf course is owned by the city of Rock Island and leased to/managed by Alta Lake Golf, Inc. Land ownership consists of the city of Rock Island, Chelan County PUD, and a private entity. Chelan County PUD ownership is in land only and the PUD has a use permit agreement with the city of Rock Island to operate the golf course.

Figure 5-15 Rock Island Golf Course

Source: Rock Island Golf Course website

Photo 5-27 Rock Island Golf Course

5.2.8 Hammond Pond Access

A paved entrance with two lanes via Saunders Place provides access on the north side of Hammond Pond (Figure 5-16). The site is owned by the city of Rock Island and managed by the Rock Island Ski Club. Visitors have access to a gravel surfaced boat launch (Photo 5-28) as well as a trash receptacle. The site is available year-round. A gravel lot allows for parking for approximately seven vehicles.

Figure 5-16 Hammond Pond Access Area

Source: Kleinschmidt 2022

Photo 5-28 Hammond Pond Access Gravel Surfaced Non-Motorized Boat Launch

5.2.9 Rock Island Marine RV Park

The Rock Island Marine RV Park (Figure 5-17 and Photo 5-29) is located on the southeast side of Putters Pond and is accessible via Parkway Drive. This campground is privately owned and operated.

Figure 5-17 Rock Island Marine RV Park

Source: Kleinschmidt 2022

Photo 5-29 Rock Island Marine RV Park Typical Site

5.3 Project Vicinity Public Recreation Areas

Opportunities for outdoor recreation are abundant within the vicinity of the Rock Island Project. Situated at the base of the Cascade Mountain Range along the Columbia River, recreation areas located within Chelan, Douglas and Grant counties offer a multitude of recreational opportunities for visitors and residents. The following discussion highlights public recreation areas that are within approximately a 1-hour drive, or up to 60 miles, of the Rock Island Project (Figure 5-17 and Figure 5-18).

5.3.1 Chelan County

5.3.1.1 Wenatchee Foothills Trails

As depicted in Figure 5-18, Wenatchee Foothills Trails is a non-motorized community trail system designed to open the trails of the western foothills to the public in perpetuity, and to manage and protect critical wildlife habitat. Wenatchee's western foothills mark the transition between the rugged shrub-steppe desert of the Columbia plateau and the ponderosa pine forests of the eastern Cascade Mountains. The foothills provide habitat and migration corridors for a variety of wildlife, including songbirds, raptors, rodents, snakes, lizards, mule deer, and coyotes.

The Wenatchee Foothills Trail system is comprised of three general areas:

1. Saddle Rock/Jacobson,
2. Castle Rock, and
3. Sage Hills/Home Water Preserve/Foothills North/Horse Lake.

As part of the third area, and required in Chelan PUD's Wildlife Management Plan,[3] Chelan PUD acquired the 960-acre tract of land, located in the foothills west of Wenatchee and outside of the Rock Island Project Boundary. The lands were incorporated into the license as Rock Island Project mitigation lands to be preserved in their natural state as a wildlife preservation site for the duration of the current license. This property is referred to as the Home Water Wildlife Preserve. There are 2.2 miles of permitted non-motorized trail for public use on the Home Water Wildlife Preserve. The trail is managed under a non-Project use conditional use permit (CUP) between the city of Wenatchee and Chelan PUD (Chelan PUD 2007). The city of Wenatchee defers some of the trail management responsibilities to the Chelan-Douglas Land Trust (CDLT). A seasonal closure is in place annually from December 1 through March 31.

[3] FERC eLibrary Accession Number 19891212-0317.

Source: CDLT 2020

Figure 5-18 Wenatchee Foothills Trails, including the Home Water Wildlife Preserve

5.3.1.2 City of Wenatchee

The city of Wenatchee manages numerous parks in the vicinity of the Rock Island Project. Table 5-2 provides additional details for several parks managed by the city of Wenatchee that offer comparable recreation to the five FERC-approved recreation sites identified in the Rock Island Project Recreation Plan.

Table 5-2 City of Wenatchee Recreation Sites

SITE NAME	FACILITIES/AMENITIES
Centennial Park	Parking area, stage, restrooms, benches, artwork
Chase Park	Picnic table, play equipment
Foothills North Natural Area	Undeveloped natural area with trail corridors
Hale Park	Parking area, dog off-leash recreation area, skate park, children's play area, picnic shelter, access to ACLT, restrooms, open lawn areas
Kiwanis Methow Park	Seasonal wading pool, play equipment, multi-use field, restroom, kiosks, picnic tables, skate area, basketball court
Lincoln Park	Parking areas, athletic fields, group picnic shelter, disc golf course
Lions Locomotive Park	Parking area, historical locomotive display, picnic tables
Lower Castle Rock Natural Area	Parking area, loop trail, picnic shelter, informational kiosk composting restroom
Pennsylvania Park	Multi-use field, wading pool, play equipment
Pioneer Park	Parking areas, skate court, picnic area, play equipment, city swimming pool
Rotary Park	Parking area, picnic shelter, disc golf course, basketball court, walking trail, splash pad, playground equipment
Saddle Rock Gateway	Parking area, shade structure, outdoor seating, interpretive signs, restrooms
Saddle Rock Natural Area	Non-motorized access trails
Washington Park	Picnic shelter, wading pool, grassy areas, play equipment
Western Hills Park	Multi-use field

Source: City of Wenatchee 2022

5.3.1.3 Malaga

Malaga is a community south of Wenatchee with approximately 4,600 residents (Chelan County 2021). Malaga Community Park, managed by the Malaga-Colockum Community Council, is a 4-acre park north of the Malaga Market. As of 2018, the community park's final plans included a soccer field, playground, and picnic areas (Malaga 2018).

5.3.1.4 Swakane Wildlife Area

Located directly west of U.S. Highway 97A and across from the Rock Island Project north of Wenatchee, the Swakane Wildlife Area (Swakane) is part of the 30,874-acre Chelan Wildlife Area managed by WDFW. Recreation activities at Swakane include hunting (deer, bighorn sheep and upland game birds), wildlife viewing, hiking, horseback riding, mountain biking, geocaching, target shooting, and shed antler hunting in the spring.

5.3.1.5 Yoyo Rock Boat Launch

Approximately 6 miles south of the Rock Island Dam is Yoyo Rock Boat Launch. This launch is owned and operated by WDFW. The boat launch is concrete and the site also offers a restroom (WDFW 2022).

5.3.1.6 Squilchick State Park

Squilchuck State Park is a 249-acre camping park located approximately 20 miles southwest of the Rock Island Dam. A ski lodge constructed in 1952 is currently a rentable day-use facility, popular for weddings and other gatherings. Squilchuck State Park includes a 160-person accommodation group camp, 20 tent sites, two showers, and one restroom. The park is at an elevation of 4,000 feet, and recreation activities include snowshoeing, sledding, cross country skiing, more than 10 miles of mountain bike trails, and equestrian activities (Washington State Parks 2021e).

5.3.1.7 Peshastin Pinnacles State Park

Peshastin Pinnacles State Park is a 34-acre day-use park located approximately 28 miles northwest of the Rock Island Dam, named after its climbable pinnacles. The park includes 1.5 miles of hiking trails, rock-climbing areas, five unsheltered picnic tables, and two vault toilets (Washington State Parks 2021d).

5.3.1.8 Entiat Park

Entiat Park, owned by Chelan PUD and operated as part of the Rocky Reach, as an approved recreation facility is approximately 34 miles north of the Rock Island Dam. Entiat Park is a 40-acre camping park. Entiat Park provides camping with 26 tent sites and RV sites with complete hookups. In addition to camping there are many day use features of the park including swimming, playground equipment, two picnic shelters, picnic areas, and a two-lane boat launch. Entiat Park is owned by Chelan PUD and managed by the city of Entiat Park and Recreation Department (Chelan PUD 2022a).

5.3.1.9 Lake Chelan State Park

Approximately 52 miles north of the Rock Island Dam is Lake Chelan State Park, a 139-acre camping park with 6,000 feet of sandy shoreline on the south shore of Lake Chelan. The park is often used as a base for hikers to further explore the North Cascades. Activities include beach exploration, boating, freshwater fishing, personal watercraft use, sailboarding, swimming, and waterskiing. The park offers one kitchen shelter without electricity, 52 unsheltered picnic tables, one single-lane boat launch, 103 standard campsites, 18 partial-hookup sites, 17 full-hookup sites, one dump station, and five restrooms with showers (Washington State Parks 2021b).

5.3.1.10 Chelan Falls Park

Chelan Falls Park, owned by Chelan PUD and operated as part of the Rocky Reach Project, as an approved recreation facility, is located approximately 53 miles north of the Rock Island Dam. Chelan Falls Park is a 33-acre day use park. The park offers day use facilities, a picnic shelter, restrooms, showers, a two-lane boat launch, short-term boat moorage, a swimming area, a shoreline trail, tennis court, playground equipment, sports fields, and horseshoe pits. The park is owned and managed by Chelan PUD (Chelan PUD 2022b).

5.3.1.11 Chelan Falls Powerhouse Park

Chelan Falls Powerhouse Park, owned by Chelan PUD and operated as part of the Rocky Reach Project, as an approved recreation facility is located approximately 53 miles north of the Rock Island Dam. Chelan Falls Powerhouse Park is a 20-acre day use park. The park offers day use facilities, a picnic shelter, restrooms and a swimming area. The park is owned and managed by Chelan PUD (Chelan PUD 2022c).

5.3.1.12 Chelan Riverwalk Park

Chelan Riverwalk Park, owned by Chelan PUD and operated as part of the Lake Chelan Hydroelectric Project P-637 (Lake Chelan Project), as an approved recreation facility, is located approximately 53 miles north of the Rock Island Dam. Chelan Riverwalk Park is a 12-acre day use park. The park offers restrooms, picnic areas, a picnic shelter, boat launch, short-term boat moorage, a one-mile scenic river loop trail and a grass playfield. The park is owned and managed by Chelan PUD (Chelan PUD 2022d).

5.3.1.13 Lake Wenatchee State Park

Approximately 55 miles northwest of the Rock Island Dam is Lake Wenatchee State Park, a 492-acre camping park with over 12,000 feet of waterfront on Lake Wenatchee and the Wenatchee River. Activities include horseback riding, biking, hiking, boating, hunting, fishing, kiteboarding, personal watercraft use, sailboarding, swimming, waterskiing, white-water kayaking, and

windsurfing. Lake Wenatchee Sno-Park (within the Lake Wenatchee State Park) offers winter recreation opportunities including 30 miles of cross-country and skate ski trails, a sledding hill, 10 miles of snowshoe trails, and winter camping with heated restrooms and showers. The park includes one boat launch, 155 standard campsites, 42 partial-hookup sites, one dump station, seven restrooms, 16 showers, and two ADA accessible campsites (Washington State Parks 2021c).

5.3.1.14 Don Morse Memorial Park

Approximately 56 miles north of the Rock Island Dam is Don Morse Memorial Park, a 40-acre day use park. The park offers 2,000 feet of waterfront which is available for swimming, boating or relaxing. The park is owned and managed by the city of Chelan (City of Chelan 2022).

5.3.2 Douglas County

5.3.2.1 City of East Wenatchee

Eastmont Metropolitan Parks and Recreation manages several parks and a portion of the ACLT in East Wenatchee, near the Rock Island Project. Table 5-3 lists the parks that are within approximately a 1-hour drive or up to 60 miles of the Rock Island Project.

TABLE 5-3 EASTMONT METROPOLITAN PARKS AND RECREATION SITES

SITE NAME	FACILITIES/AMENITIES
Eastmont Community Park	Parking area, Eastmont Metropolitan Parks and Recreation aquatic center, sports field, baseball park, picnic shelters, walking trail, playground, basketball, pickleball and tennis courts, soccer and futsal field, restrooms, splash pad
Kenroy Park	Picnic shelters, playground, skateboard park
Tedford Park	Picnic tables, restrooms, baseball field, frisbee golf course

Source: Eastmont Metropolitan Parks and Recreation 2022

5.3.2.2 Lincoln Rock State Park

Lincoln Rock State Park, owned by Chelan PUD and operated as part of the Rocky Reach Project, as an approved recreation facility, is an 86-acre camping park on the east side of Lake Entiat. Lincoln Rock State Park is located approximately 22 miles north of the Rock Island Dam. The portion of the park adjacent to the campgrounds resembles a city park, with ball fields, tennis and basketball courts, a playground, and a public swim beach. The park is home to the Rocky Reach Trail, a paved, mixed-use ADA-accessible trail. The trail connects to the ACLT. Altogether, these trails offer more than 20 miles of walking, jogging, and bicycling fun (Washington State Park 2022a).

5.3.2.3 Orondo Park

Orondo Park, owned by Chelan PUD and operated as part of the Rocky Reach Hydroelectric Project P-2145 (Rocky Reach Project), as an approved recreation facility is approximately 32 miles north of the Rock Island Dam. Orondo Park offers free day use boat launching via a one lane boat launch. The site also provides a picnic shelter, restrooms, short-term moorage, and a swim beach. The site is owned by Chelan PUD and managed by Chelan Douglas Regional Port Authority (Chelan PUD 2022e).

5.3.2.4 Apricot Orchard Boat Launch

Apricot Orchard boat launch, owned by Grant County PUD and operated as part of the Wanapum Hydroelectric Project P-2114 (Wanapum Project), as an approved recreation facility, is located approximately 33 miles south of the Rock Island Dam. This site offers a single-lane boat launch, ADA transfer platform, parking area, ADA paths/access, vault toilet and informational kiosk (Grant PUD 2022).

5.3.2.5 Daroga State Park

Daroga State Park, owned by Chelan PUD and operated as part of the Rocky Reach Project, as an approved recreation facility, is a 127-acre camping park with 1.5 miles of Columbia River Shoreline on the elevated edge of the desert scablands. Daroga State Park is approximately 36 miles north of the Rock Island Dam. Daroga offers a green oasis amid the dry rolling hills of this central Washington landscape. The park offers a lagoon that is perfect for beginning swimmers and paddlers. The section of the river beyond makes the park a destination for boaters and water sports fans (Washington State Parks 2022b).

5.3.2.6 Beebe Bridge Park

Beebe Bridge Park, owned by Chelan PUD and operated as part of the Rocky Reach Project, as an approved recreation facility, is located approximately 51 miles north of the Rock Island Dam. Beebe Bridge Park is a 56-acre park. The Beebe Bridge Park offers camping, restrooms, showers, day use facility, picnic shelters, a swimming area, a two-lane boat launch, short-term boat moorage, tennis courts, playground equipment, horseshoe pits and a shoreline trail (Chelan PUD 2022f).

5.3.3 Grant County

5.3.3.1 Crescent Bar Recreation Area

Crescent Bar Recreation Area, owned by Grant County PUD and operated as part of the Priest Rapids Hydroelectric Project P-2114 (Priest Rapids Project), as an approved recreation facility, is approximately 38 miles south of the Rock Island Dam. The recreation area encompasses a campground, golf course, two parks, two boat launch access areas, and eight beaches (CBRA 2022).

6.0 CONCLUSION

The 2022 Rock Island Recreation Resources Inventory identified the facilities and amenities located within the five FERC-approved recreation sites identified in the Rock Island Project Recreation Plan. In addition, there were nine non-FERC approved recreation sites identified as available to the public within the Rock Island Project boundary. The Recreation Resources Inventory also identified the Apple Capital Loop Trail, which surrounds a large portion of the Rock Island Project boundary. The Apple Capital Loop Trail meanders in and out of many of the recreation sites that were identified. Finally, there were many sites that provide similar recreation to those sites within the Rock Island Project boundary that were identified within the Rock Island Project vicinity. Of these sites, there were 28 sites identified in Chelan County, eight sites identified in Douglas County, and one site identified in Grant County.

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Appendix A RECREATION SITE INVENTORY FORM

RECREATION SITE INVENTORY FORM

Observed by:_____Date/Time: _____
Site Name and Location: _____
Latitude: _____ Longitude_____

Facility Type (Primary Purpose):

Developed Facilities: ☐ Boat Launch ☐ Picnic Area ☐ Angling Access
☐ Campground ☐ Swim Area ☐ Overlook/Roadside Pull-off
☐ Other Day Use: _____

Undeveloped Facilities: ☐ Primitive Campsite ☐ Informal Boat Launch ☐ Informal Angling
☐ Other

Road Access: Condition Description: _____
_____

☐ Paved access # entrances _____ # lanes _____ ☐ Circular entrance/exit ☐ Signage
☐ Unpaved access # entrances _____ # lanes _____ ☐ Circular entrance/exit ☐ Signage

Parking Lots: Condition Description: _____
_____

Type	# Paved	# Gravel	Space Delineation
ADA Spaces	_____	_____	☐ Painted ☐ Curbs ☐ Signage
Regular Spaces	_____	_____	☐ Painted ☐ Curbs ☐ Signage
Vehicle & Trailer Spaces	_____	_____	☐ Painted ☐ Curbs ☐ Signage

Operations:

☐ Staffed ☐ Unstaffed ☐ Seasonal (From _____To_____)
☐ Fee: (Site $_____; Parking $_____) ☐ Year Round
Operating Hours_____ Owner/Manager_____
Project Facility: _____ Within FERC Project Boundary?_____

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	#	Type	#	Type
_____	Picnic Shelter	_____	Fishing Pier/Platform	_____	Boat Launch/Access
_____	Picnic Tables	_____	Hiking/Walking Trail	_____	Boating Prep Area
_____	Trash Cans	_____	Fishing Trail	_____	Designated Swim Area
_____	Grills	_____	Overlook	_____	Designated Campsite
_____	Firepit/ring	_____	Fishing Prep Area	_____	Safety Signage
_____	Restrooms	_____	Information Kiosk	_____	Informational Signage
_____	Other (specify)_____				

Boat Launch Facilities: Condition Description: _____

Craft Type: ☐ Motorized ☐ Carry In ☐ Boat Prep Area

Launch Type: ☐ Hard surface ☐ Gravel ☐ Informal (undeveloped)

☐ ADA Compliant ☐ Turn-around area _____ # of Lanes

Fishing Prep Area/Docks: Condition Description: _____

☐ Prep Area ☐ Fishing Dimensions:_____ ☐ ADA Compliant

☐ Prep Area ☐ Fishing Dimensions:_____ ☐ ADA Compliant

Trails: Condition Description: _____

Type:_____ Length (ft):____ Condition: _____ ☐ ADA Compliant

Type:_____ Length (ft):____ Condition: _____ ☐ ADA Compliant

Type:_____ Length (ft):____ Condition: _____ ☐ ADA Compliant

Interpretive/Site Information Condition Description: _____

Display Type: ☐ None ☐ Kiosk ☐ Other ____ No. of Displays

Information Type: ☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type

☐ Regional Events ☐ Other (specify)_____

Sanitation Facilities: Condition Description: _____

	# Flush	(# ADA)	# Portable	(# ADA)
Unisex	_____	(_____)	_____	(_____)
Women	_____	(_____)	_____	(_____)
Men	_____	(_____)	_____	(_____)

Campground/Campsite: Condition Description: _____

_____

	RV sites	Tent sites	Cabins/Cottages	Group sites	Primitive sites
Total # of sites	_____	_____	_____	_____	_____
ADA compliant	_____	_____	_____	_____	_____

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):

Appendix B CONSULTATION RECORD

Chelan PUD submitted the draft Recreation Resources Inventory Report to the Recreation and Land Use Working Group (TWG) (see Table B-1) via email on January 27, 2023 for a 10-day comment and review period. During this time, a comment link was posted publicly on Chelan PUD's website to allow stakeholders not participating in the TWG the opportunity to comment. Comments received from the stakeholders, with applicable responses, are provided in Table B-2 below.

Table B-1 Organization Names and Recreation and Land Use TWG Member Names

ORGANIZATION	NAME
American Rivers	Bridget Moran
American Whitewater	Thomas O'Keefe
Audubon Society	Bruce McCammon
Bureau of Indian Affairs	Rudy Peone
Bureau of Indian Affairs	Steve Lewis
Chelan County Public Utility District No. 1	Ryan Baker
Chelan County Public Utility District No. 1	Ray Heit
Chelan County Public Utility District No. 1	Matt Shales
Chelan County Public Utility District No. 1	Michelle Smith
Chelan County Public Utility District No. 1	Kate Taylor
Chelan County Public Utility District No. 1	Janel Ulrich
Chelan Douglas Regional Port Authority	Stacie De Mestre
City of East Wenatchee	Curtis Lillquist
City of Rock Island	Charity Duffy
City of Rock Island	Brock Laughlin
City of Rock Island	James Zumini
Columbia River Inter-Tribal Commission	Julie Carter
City of Wenatchee	Laura Gloria
Complete the Loop Coalition	Peter Burgoon
Complete the Loop Coalition	Mike Sorensen
Confederated Tribes and Bands of Yakama Nation	Elaine Harvey
Confederated Tribes and Bands of Yakama Nation	Tom Iverson
Confederated Tribes and Bands of Yakama Nation	Keely Murdoch
Confederated Tribes of the Umatilla Indian Reservation	Joe Pitt
Eastmont Metropolitan Parks and Recreation	Sally Brawley
Eastmont Metropolitan Parks and Recreation	Charles Brown
Individual	Steve Hays
Individual	John King
Kearns & West	Mary Beth Day
Kearns & West	Angela Hessenius

ORGANIZATION	NAME
Kearns & West	Kelsey Rugani
Kearns & West	Jim Downing
Kearns & West	Katy Kennedy
Kleinschmidt Associates	Jeff Deason
Kleinschmidt Associates	Nathalie Denis
Kleinschmidt Associates	Fatima Oswald
Kleinschmidt Associates	Angela Whelpley
US Bureau of Land Management	Curtis Bryan
US Bureau of Land Management	Diane Priebe
US Bureau of Land Management	Katherine Russel
US Bureau of Reclamation	Gina Hoff
US Fish and Wildlife Service	Randi Riggs
Washington State Department of Ecology	Mark Peterschmidt
Washington State Department of Ecology	Breean Zimmerman
Washington State Department of Fish and Wildlife	Benjamin Blank
Washington State Department of Fish and Wildlife	Richard Finger
Washington State Department of Fish and Wildlife	Patrick Verhey
Washington State Dept of Natural Resources	Cindy Preston
Washington State Parks	Colleen Foster
Washington State Parks	Chelsea Harris
Washington State Parks	Brian Patnode
Wenatchee Row and Paddle Club	Eric Thorson

Table B-2 Comments Received

COMMENT #	COMMENT DATE	NAME / ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
I-1-1	2/02/23	Colleen Foster, Washington State Parks	Rock Island Relicensing Recreation Inventory Draft Report	No comments at this time.	Thank you for your review.
I-2-1	2/11/23	John King, Citizen	Rock Island Relicensing Recreation Inventory Draft Report	I have not reviewed the document and have no comments.	Thank you for your comment.
I-3-1	2/07/23	Bruce McCammon, Audubon	Rock Island Relicensing Recreation Inventory Draft Report	I thought the survey was well done. I have no comments.	Thank you for your review.
A-1-1	2/07/23	Katherine Russell, Bureau of Land Management	Rock Island Relicensing Recreation Inventory Draft Report	Comprehensive and informative. Slight difficulty relating site descriptions sections to the correct Figure upon which they are displayed.	Thank you for your review and feedback. The report is organized to describe each site, with a figure(s) of the site and any applicable photographs. We will explore section breaks to help the reader navigate. Hopefully, this description of the report format helps.
A-2-1	2/10/23	Laura Gloria, City of Wenatchee	Rock Island Relicensing Recreation Inventory Draft Report	No comments.	Thank you for your review.

COMMENT #	COMMENT DATE	NAME / ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
A-3-1	2/13/23	Charity Duffy, City of Rock Island	Rock Island Relicensing Recreation Inventory Draft Report	See attached letter.[4]	Thank you for your review and feedback. Regarding the City's concern that inventory site descriptions for Big Bow and Hideaway Ponds are not adequate, the consulted upon objectives of this study include: • Field verify, map, and document FERC-approved Rock Island Project recreation sites and facilities developed by Chelan PUD as part of the Recreation Plan for the Rock Island Project. • Document the general condition of FERC-approved Rock Island Project recreational sites and facilities in the Recreation Plan and describe their maintenance, inspection and/or management practices. • Field verify, map, and document non-Rock Island Project public recreation sites and facilities that support publicly available recreation within the existing Rock Island Project Boundary. • Identify recreation sites within the general vicinity of the Rock Island Project that provide comparable recreation opportunities as the sites identified in

[4]Email and comment letter are attached at the end of this document.

COMMENT #	COMMENT DATE	NAME / ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
					the FERC-approved Rock Island Project Recreation Plan. The Rock Island Ponds are not one of the five FERC-approved Rock Island Project recreation sites, therefore, consistent with the scope of this study, the recreation areas located at the Rock Island Ponds were verified, mapped, and documented. Consistent with other non-FERC-approved publicly available recreation areas, the general condition, including maintenance, inspection and/or management practices are not addressed in the inventory. The Rock Island Ponds do not serve any project purpose. Regarding the history of co-maintenance of Big Bow and Hideaway Ponds, Chelan PUD will clarify in the report that no official agreement or financial assistance between the Chelan PUD and the City of Rock Island is in place for this work. The remaining feedback, which extends beyond the scope of the Inventory Report, may be brought forward by participants, as warranted, in the formal FERC-led Integrated Licensing Process (ILP) beginning after Chelan PUD submits its Notice of Intent and Pre-Application Document.

COMMENT #	COMMENT DATE	NAME / ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
	4/14/23	Chelan PUD	Rock Island Relicensing Recreation Inventory Draft Report	Updated the Coyote Dunes Natural Area section to include information regarding FERC's March 15, 2023 approval of the Coyote Dunes Natural Area Management Plan.	Updated Section 5.1.5 text and Figure 5-8.
	4/14/23	Chelan PUD	Rock Island Relicensing Recreation Inventory Draft Report	Added a Rock Island Project Recreation Facilities table.	Added Table 5-1.
	4/14/23	Chelan PUD	Rock Island Relicensing Recreation Inventory Draft Report	Added the Rock Island Golf Course to Section 5.2, Non-Rock Island Project Public Recreation Sites within the Rock Island Project Boundary.	Added Section 5.2.7 including text, site figure, and photo.
	4/14/23	Chelan PUD	Rock Island Relicensing Recreation Inventory Draft Report	Updated Apple Capital Loop Trail management details.	Updated Figure 5-9.

COMMENT #	COMMENT DATE	NAME / ENTITY	DOCUMENT OR REPORT NAME	STAKEHOLDER COMMENT	CHELAN PUD RESPONSE
	4/20/23	Chelan PUD	Rock Island Relicensing Recreation Inventory Draft Report	Added a Report Conclusion.	Added Section 6.0.

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Tuesday, February 7, 2023 12:18 PM
To: RIRelicensing <RIRelicensing@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'Patrick.Verhey@dfw.wa.gov' <Patrick.Verhey@dfw.wa.gov>; Matt Shales <Matt.Shales@chelanpud.org>; 'cLillquist@eastwenatcheewa.gov' <cLillquist@eastwenatcheewa.gov>; 'Richard.Finger@dfw.wa.gov' <Richard.Finger@dfw.wa.gov>; 'bmoran@americanrivers.org' <bmoran@americanrivers.org>; 'stacie@cdrpa.org' <stacie@cdrpa.org>; 'bruce.mccammon@gmail.com' <bruce.mccammon@gmail.com>; 'brian.patnode@parks.wa.gov' <brian.patnode@parks.wa.gov>; 'colleen.foster@parks.wa.gov' <colleen.foster@parks.wa.gov>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'cbryan@blm.gov' <cbryan@blm.gov>; 'Chelsea.Harris@parks.wa.gov' <Chelsea.Harris@parks.wa.gov>; 'cindy.preston@dnr.wa.gov' <cindy.preston@dnr.wa.gov>; 'diane_priebe@blm.gov' <diane_priebe@blm.gov>; 'epthome509@gmail.com' <epthome509@gmail.com>; 'ghoff@usbr.gov' <ghoff@usbr.gov>; 'hare@yakamafish-nsn.gov' <hare@yakamafish-nsn.gov>; 'ivet@yakamafish-nsn.gov' <ivet@yakamafish-nsn.gov>; 'john@kingrose.us' <john@kingrose.us>; 'mape461@ecy.wa.gov' <mape461@ecy.wa.gov>; 'murk@yakamafish-nsn.gov' <murk@yakamafish-nsn.gov>; 'okeefe@americanwhitewater.org' <okeefe@americanwhitewater.org>; 'randi_riggs@fws.gov' <randi_riggs@fws.gov>; 'Rudy.peone@bia.gov' <Rudy.peone@bia.gov>; Ryan Baker <Ryan.Baker@chelanpud.org>; 'sghays51@msn.com' <sghays51@msn.com>; 'treasurer@rockislandwa.gov' <treasurer@rockislandwa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'mike@completetheloopcoalition.org' <mike@completetheloopcoalition.org>; 'JoePitt@ctuir.org' <JoePitt@ctuir.org>; 'LGloria@WenatcheeWA.Gov' <LGloria@WenatcheeWA.Gov>; 'krugani@kearnswest.com' <krugani@kearnswest.com>; 'angela.whelpley@kleinschmidtgroup.com' <angela.whelpley@kleinschmidtgroup.com>; 'sbrawley@eastmontparks.com' <sbrawley@eastmontparks.com>; 'cbrown@eastmontparks.com' <cbrown@eastmontparks.com>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; 'mbday@kearnswest.com' <mbday@kearnswest.com>; 'jdowning@kearnswest.com' <jdowning@kearnswest.com>; 'pburgoon@g-o.com' <pburgoon@g-o.com>; Janel Ulrich <janel.ulrich@chelanpud.org>; Kate Taylor <Kate.Taylor@chelanpud.org>; 'Nathalie.Denis@Kleinschmidtgroup.com' <Nathalie.Denis@Kleinschmidtgroup.com>; 'fatima.oswald@kleinschmidtgroup.com' <fatima.oswald@kleinschmidtgroup.com>; 'krussell@blm.gov' <krussell@blm.gov>; 'kkennedy@kearnswest.com' <kkennedy@kearnswest.com>; Ray Heit <ray.heit@chelanpud.org>; 'stephen.lewis@bia.gov' <stephen.lewis@bia.gov>; 'jeff.deason@kleinschmidtgroup.com' <jeff.deason@kleinschmidtgroup.com>; 'carj@critfc.org' <carj@critfc.org>; 'edc@rockislandwa.gov'; <edc@rockislandwa.gov>

Subject: RE: RI Relicensing Recreation Inventory Draft Report - Comment Opportunity

Hello,

Reminder to please submit your comments by the end of day on Friday, February 10.

We appreciate responses to this email even though you may have 'no comments' on the report. This will be very helpful for the consultation record.

Thank you,

Kate Taylor
Licensing & Compliance Specialist

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Friday, January 27, 2023 4:10 PM
Subject: RI Relicensing Recreation Inventory Draft Report - Comment Opportunity

Good afternoon,

Here is the link to comment on the **Rock Island Relicensing Recreation Inventory Draft Report**.
Click the link to access the document and submit your comments.
Comments are to be submitted by EOD Friday, February 10, 2023.

This report will also be on the agenda for the February 16th Recreation & Land Use TWG meeting.

Thank you for your participation.

Kate Taylor
Licensing & Compliance Specialist
Chelan PUD
[M] 509-899-5555
[W] 509-661-4410

Search Comment Items

Public Comment Form

1 Comment | 2 Review | 3 Your Copy

Rock Island Relicensing Recreation Inventory Draft Report

Chelan County PUD invites stakeholders to provide comments on our draft study plan. Please review the document (click "review document" button below) and provide comments.

Contact Information

All fields are optional unless otherwise indicated.

Submitted By

Individual

First Name (Required)

Last Name (Required)

Address

City

State

Washington

ZIP

Email (Required)

Your Comment

Comments can be submitted through an attachment or provided directly in the space below.

Review Document

Insert comments on Rock Island Relicensing Recreation Inventory Draft Report

Upload File

"Uploading a file is optional"

You may attach up to five 30 MB files to accompany your submission. Allowed formats are pdf, jpg, jpeg, png, txt, gif, doc, docx. If you experience technical difficulties submitting your comment, please contact the person listed at the bottom of this page.

From:	EDC
To:	Janel Ulrich; Matt Shales
Cc:	Brock Laughlin; RA; Randy Agnew; James Zumini
Subject:	[External] RRIR - Rock Island Comment Letter
Date:	Monday, February 13, 2023 12:41:15 PM
Attachments:	02 09 2023 City of Rock Island RRIR Comments.pdf

---

Good afternoon,

Please see the attached letter from Mayor Agnew providing comments to the Recreation Resources Inventory Report. My apologies this is getting to you late.

Please reach out directly to Mayor Agnew if you have any questions or concerns. Have a wonderful day. Charity

Charity Duffy
Economic Development Coordinator/Planning
City of Rock Island
Office (509) 884-1261 ext. 108
Cell (509) 771-9485

CITY OF
ROCK ISLAND

February 9, 2023

Randy Agnew, Mayor
City of Rock Island
509-884-1261
mayor@rockislandwa.gov

Janel Ulrich, Manager of Hydro Licensing
Chelan County PUD
509-661-4400
Janel.ulrich@chelanpud.org

RE: Comments to the Recreation Resources Inventory Report January 2023

Dear Janel Ulrich,

Thank you for the opportunity to comment on the Draft Recreational Resources Inventory Report (RRIR) for the Rock Island Hydroelectric Project (Project), FERC No. 943 (Kleinschmidt, January 2023). The City of Rock Island (City) is a low-income, rural community with a population which has doubled over the last 5 years. Lack of active management of Big Bow and Hideaway Ponds by Chelan PUD has adversely created inequitable access to recreational opportunities to the community, including access to prime birdwatching. The City is concerned assurance to providing improved availability of recreational opportunities will be excluded from the final FERC license, thus access to the ponds will continue to be less than adequate for safe usage by residents and visitors.

The City does not agree with Chelan PUDs approach to developing recreational study goals because they exclude safe access to and around the Pond, as well as shoreline maintenance (i.e., vegetation control, adequate bathrooms and trash disposal). The inventory descriptions and photographs illustrated of the ponds within the RRIR are awfully misleading to FERC staff and others reviewing the RRIR. The City encourages FERC staff to conduct a field visit to the ponds to gain a better understanding of the City's management concerns.

Big Bow Pond
Chelan PUD does not describe the quality of access, maintenance, signage, and "restroom" to Big Bow Pond with candid details. Please see the City's formal responses to Chelan PUD's misrepresentation of Big Bow Pond access and maintenance.

> Chelan PUD (RRIR): *"Big Bow Pond has two access points at the east and west ends of the lake. Chelan PUD owns the property at both access points. These sites*

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are co-maintained by Chelan PUD and the City of Rock Island, as well as others."

City's Response*: Chelan PUD is correct; the pond and the shoreline is owned by Chelan PUD. However, there is not an agreement between the City of Rock Island and Chelan PUD to "co-maintain" Big Bow Pond. It is also unclear who "as well as others" Chelan PUD is referring to. The only reason the City of Rock Island maintains garbage at the pond is because it is a blithe to the residents and does not attract visitors (Figure 1). The City, with its own staff and funding, dispose of all trash with zero financial assistance from Chelan PUD for staff efforts and disposal costs. The level of maintenance performed by the City is limited to trash disposal, which includes large trash items such as tires, mattresses, construction debris, etc. Access to the site is marked by a black and white sign (Figure 2) at the top of the access road. The access road is steep, has a large pothole (Figure 3), and unmaintained vegetation obstructs vehicular site distance.*

Figure 1. Unmaintained vegetation, toilet, and trash.

Figure 2. Access sign courtesy of Chelan PUD.

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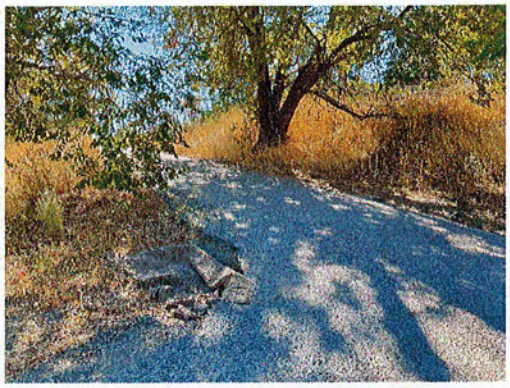

Figure 3. Access road with unmaintained vegetation and large pothole.

Chelan PUD (RRIR): "*Visitors have access to a trash receptable, one potable restroom, a concrete non-motorized boat launch, and informational sign.*"

City's Response: *Chelan PUD is correct that visitors have access to an unmaintained, porta potty that is not cleaned on a reasonable schedule. The trash receptable which is disposed of by City staff without financial assistance from Chelan PUD, is often overflowing; Chelan PUD does not provide maintenance staff to support clean-up efforts.*

The concrete, non-motorized boat launch lacks signage and would benefit from renovation. As shown in Figure 2, the sign provided by Chelan PUD is distinctive to all other signs provided by Chelan PUD within the Project; the sign provided by Chelan PUD to access Big Bow Pond is marginal when compared to other Chelan PUD signage (Figure 4).

Figure 4. Example of Chelan PUD signage at other locations with the project area.

Hideaway Pond

Chelan PUD does not describe the quality of access, maintenance, signage, and "restroom" to Hideaway Pond accurately. Please see formal responses to the Chelan PUD's misrepresentation of Hideaway Pond access and maintenance.

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Chelan PUD (RRIR): *"Hideaway Pond has one access point on the east side of the lake. Chelan PUD owns the pond access site and Douglas County owns the access road and parking lot. The site is managed by Chelan PUD and Douglas County, with the City of Rock Island involvement."*

City's Response: *As with Big Bow Pond, the City does not have an agreement with Chelan PUD to be "involved" with the maintenance of Hideaway Pond. The City cleans up the garbage as a courtesy to the surrounding community with no financial assistance from either Chelan PUD or Douglas County.*

Chelan PUD (RRIR): *"Access to the pond is available via Idaho Avenue via an unpaved two-lane gravel entrance. Visitors have access to trash receptacle, a gravel surfaced non-motorized boat launch, and one portable restroom."*

City's Response: *Access to the pond is very limited due to overgrown vegetation littered with ticks (Figure 5). The access road is signed with the same signage as Big Bow Pond (Figure 2). The trash receptable is emptied by City staff without financial assistance from Chelan PUD; a "co-maintenance" agreement does not exist between the City and Chelan PUD. The non-motorized boat launch would benefit from renovation and vegetation management. The portable restroom is not regularly cleaned (Figure 6).*

Figure 5. Shoreline access gate and unmanaged trail.

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Figure 6. Restroom at Hideaway Lake.

The City is concerned that both Big Bow and Hideaway Ponds are not adequately described in the RRIP, therefore may not get adequate review by FERC or other interested stakeholder groups. The City is requesting Chelan PUD put together an improvement plan and maintenance agreement with the City for review and signature to avoid unnecessary inequities to safe, water access provided by other Chelan PUD owned properties.

Please feel free to contact me by phone to discuss in further detail at (509) 679-7557. Thanks again for the opportunity to comment on the Draft RRIR.

Sincerely

Randy Agnew

Randy Agnew, Mayor of Rock Island

Kate Taylor

From: Laura Gloria <LGloria@WenatcheeWA.Gov>
Sent: Friday, February 10, 2023 2:45 PM
To: RIRelicensing
Subject: [External] RE: RI Relicensing Recreation Inventory Draft Report - Comment Opportunity

No comments.

Thank you,
Laura Gloria
Executive Services Director
(509) 888-3616

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Tuesday, February 7, 2023 12:18 PM
To: RIRelicensing <RIRelicensing@chelanpud.org>; 'Benjamin.Blank@dfw.wa.gov' <Benjamin.Blank@dfw.wa.gov>; 'Patrick.Verhey@dfw.wa.gov' <Patrick.Verhey@dfw.wa.gov>; Matt Shales <Matt.Shales@chelanpud.org>; 'cLillquist@eastwenatcheewa.gov' <cLillquist@eastwenatcheewa.gov>; 'Richard.Finger@dfw.wa.gov' <Richard.Finger@dfw.wa.gov>; 'bmoran@americanrivers.org' <bmoran@americanrivers.org>; 'stacie@cdrpa.org' <stacie@cdrpa.org>; 'bruce.mccammon@gmail.com' <bruce.mccammon@gmail.com>; Patnode, Brian (PARKS) <brian.patnode@parks.wa.gov>; 'colleen.foster@parks.wa.gov' <colleen.foster@parks.wa.gov>; 'bzim461@ecy.wa.gov' <bzim461@ecy.wa.gov>; 'cbryan@blm.gov' <cbryan@blm.gov>; 'Chelsea.Harris@parks.wa.gov' <Chelsea.Harris@parks.wa.gov>; 'cindy.preston@dnr.wa.gov' <cindy.preston@dnr.wa.gov>; 'diane_priebe@blm.gov' <diane_priebe@blm.gov>; 'epthome509@gmail.com' <epthome509@gmail.com>; 'ghoff@usbr.gov' <ghoff@usbr.gov>; 'hare@yakamafish-nsn.gov' <hare@yakamafish-nsn.gov>; 'ivet@yakamafish-nsn.gov' <ivet@yakamafish-nsn.gov>; 'john@kingrose.us' <john@kingrose.us>; 'mape461@ecy.wa.gov' <mape461@ecy.wa.gov>; 'murk@yakamafish-nsn.gov' <murk@yakamafish-nsn.gov>; 'okeefe@americanwhitewater.org' <okeefe@americanwhitewater.org>; 'randi_riggs@fws.gov' <randi_riggs@fws.gov>; 'Rudy.peone@bia.gov' <Rudy.peone@bia.gov>; Baker, Ryan <ryan.baker@chelanpud.org>; 'sghays51@msn.com' <sghays51@msn.com>; 'treasurer@rockislandwa.gov' <treasurer@rockislandwa.gov>; 'bladescodeservices@yahoo.com' <bladescodeservices@yahoo.com>; 'mike@completetheloopcoalition.org' <mike@completetheloopcoalition.org>; 'JoePitt@ctuir.org' <JoePitt@ctuir.org>; Laura Gloria <LGloria@WenatcheeWA.Gov>; 'krugani@kearnswest.com' <krugani@kearnswest.com>; 'angela.whelpley@kleinschmidtgroup.com' <angela.whelpley@kleinschmidtgroup.com>; 'sbrawley@eastmontparks.com' <sbrawley@eastmontparks.com>; 'cbrown@eastmontparks.com' <cbrown@eastmontparks.com>; 'AHessenius@kearnswest.com' <AHessenius@kearnswest.com>; 'mbday@kearnswest.com' <mbday@kearnswest.com>; 'jdowning@kearnswest.com' <jdowning@kearnswest.com>; 'pburgoon@g-o.com' <pburgoon@g-o.com>; Ulrich, Janel <janel.ulrich@chelanpud.org>; Kate Taylor <Kate.Taylor@chelanpud.org>; 'Nathalie.Denis@Kleinschmidtgroup.com' <Nathalie.Denis@Kleinschmidtgroup.com>;

Kate Taylor

From: Bruce McCammon <bruce.mccammon@gmail.com>
Sent: Tuesday, February 7, 2023 2:27 PM
To: RIRelicensing
Subject: [External] Re: RI Relicensing Recreation Inventory Draft Report - Comment Opportunity

I thought the survey was well done.

I have no comments.

Bruce

On Feb 7, 2023, at 12:19 PM, RIRelicensing <RIRelicensing@chelanpud.org> wrote:

Hello,

Reminder to please submit your comments by the end of day on Friday, February 10.

We appreciate responses to this email even though you may have 'no comments' on the report. This will be very helpful for the consultation record.

Thank you,

Kate Taylor
Licensing & Compliance Specialist

From: RIRelicensing <RIRelicensing@chelanpud.org>
Sent: Friday, January 27, 2023 4:10 PM
Subject: RI Relicensing Recreation Inventory Draft Report - Comment Opportunity

Good afternoon,

Here is the link to comment on the **Rock Island Relicensing Recreation Inventory Draft Report**. Click the link to access the document and submit your comments.
Comments are to be submitted by EOD Friday, February 10, 2023.

This report will also be on the agenda for the February 16th Recreation & Land Use TWG meeting.

Thank you for your participation.

Kate Taylor
Licensing & Compliance Specialist
Chelan PUD

APPENDIX H INFORMATION FOR PLANNING AND CONSULTATION

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Chelan and Douglas counties, Washington

Local office

Washington Fish And Wildlife Office

(360) 753-9440
(360) 753-9405

510 Desmond Drive Se, Suite 102
Lacey, WA 98503-1263

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Gray Wolf Canis lupus There is **final** critical habitat for this species. https://ecos.fws.gov/ecp/species/4488	Endangered
North American Wolverine Gulo gulo luscus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5123	Threatened

Birds

NAME	STATUS
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bull Trout Salvelinus confluentus There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/8212	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Showy Stickseed Hackelia venusta Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5210	Endangered
Wenatchee Mountains Checkermallow Sidalcea oregana var. calva Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/7222	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Bull Trout Salvelinus confluentus https://ecos.fws.gov/ecp/species/8212#crithab	Final

Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service office.

Additional information can be found using the following links:

- Eagle Managment https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Bald and Golden Eagle information is not available at this time

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Migratory bird information is not available at this time

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1Ch
- PEM1Ah
- PEM1C

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1Ch
- PFO1Ah
- PSS1C
- PFO1C
- PSS1A
- PSS1Ah

FRESHWATER POND

- PUBHh
- PUBH
- PUBFh

LAKE

- L1UBHh
- L1UBH

RIVERINE

R3UBH
R5UBH
R4SBC
R5UBFx

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX I RARE, THREATENED, AND ENDANGERED PLANTS (PRIVILEGED)

I.1 2022 RARE, THEATENED, AND ENDANGERED PLANTS STUDY REPORT (PRIVILEGED)

I.2 2023 UTE LADIES'-TRESSES SURVEYS STUDY PLAN AND STUDY REPORT (PRIVILEGED)