



eBird Insights

Investigating the birds of
North Central Washington

(Chelan, Douglas, Ferry, and Okanogan counties)

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August 2022

Version 1.8



North Central Washington
AUDUBON SOCIETY



www.ncwaudubon.org

This paper is best viewed in Adobe Acrobat PDF format
using a two-page view with "show cover page" selected.

Introduction

The Cornell Laboratory of Ornithology rolled out eBird (www.ebird.org) in 2002 with the hope of it becoming a robust, community-driven bird sighting repository. Little did they know how it would grow. People use the eBird mobile app or website to create and submit their checklists. Today, there are over 1 billion bird sightings in the database. Checklists, an essential format for recording field observations, now number nearly 80 million. Over 200 countries and about 700,000 observers (eBirders) have submitted data. When we press “submit” in the mobile eBird app or on our computers, our checklists fly through the digital cloud to perch in the eBird global database. The data are used by scientists, conservationists, and educators. Contributors use eBird to keep track of their bird sightings in their yards, counties, states, or globally.

The eBird website allows us to ‘explore’ the data at a point, within an area, and over a specified time period. You may be surprised at how much insight into birds can be found with just a few clicks of a mouse. You can see state-of-the-art animations and maps of migration patterns and ranges. Bar charts allow you to view the seasonal occurrence of birds. You can create and maintain checklists of birds you want to see or birds you have seen. The website is really quite impressive.

Appreciation begins with *awareness* and *understanding*

And yet, the website capabilities are limited. It simply cannot answer all the questions we may have. eBird allows us to download the data for an area and time period. Once we’ve downloaded the data from eBird, it is up to us to design the analyses to answer questions we have. eBird records from the NCWAS four-county (Chelan, Douglas, Ferry, and Okanogan) area begin in 1967. Use began to accelerate about 2007 with substantial use of eBird beginning in 2015 for all counties. For the most-part, this paper uses data collected between 2015 and June 2022. The use of other periods is noted in accompanying text or captions.

Four major questions about the birds of North Central Washington are:

Who? According to the Washington Ornithological Society, there are 510 fully accredited bird species in Washington State. Which of these species have eBirders documented in North Central Washington?

When? We see some birds every month of the year. Others migrate through, stopping briefly. During which months can we expect to have the greatest chance to see a particular species in North Central Washington?

How many? The number of birds we see at any given time varies greatly. We may see giant flocks of geese or wigeons. Individuals may show up as vagrant sightings providing a one-time chance to see the species. Which bird families or species show up in the greatest numbers?

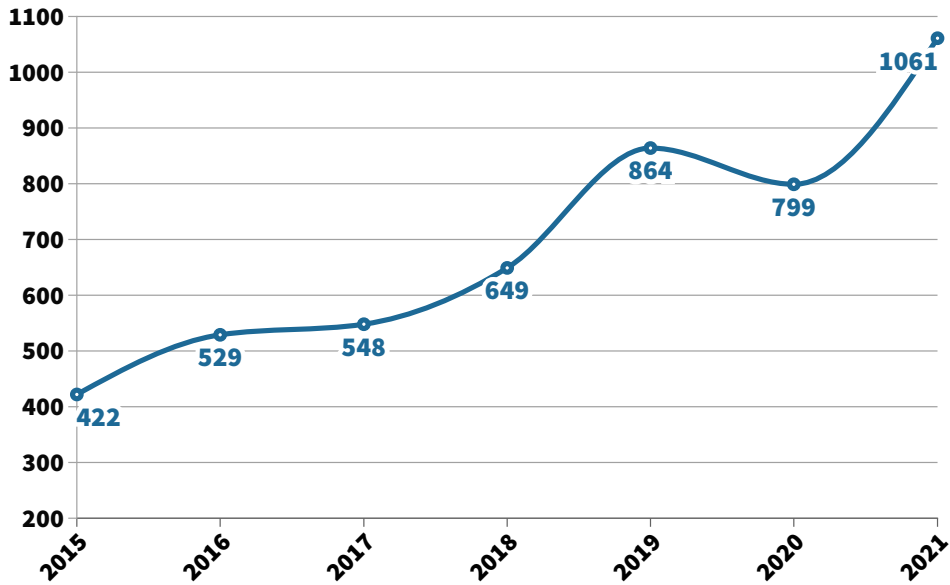
Where? This is a question of habitat, bird physiology, and human presence. Which areas in North Central Washington do eBirders visit most? What most influences our decision to visit to an area, birds or accessibility? Both?

eBird Use in North Central Washington

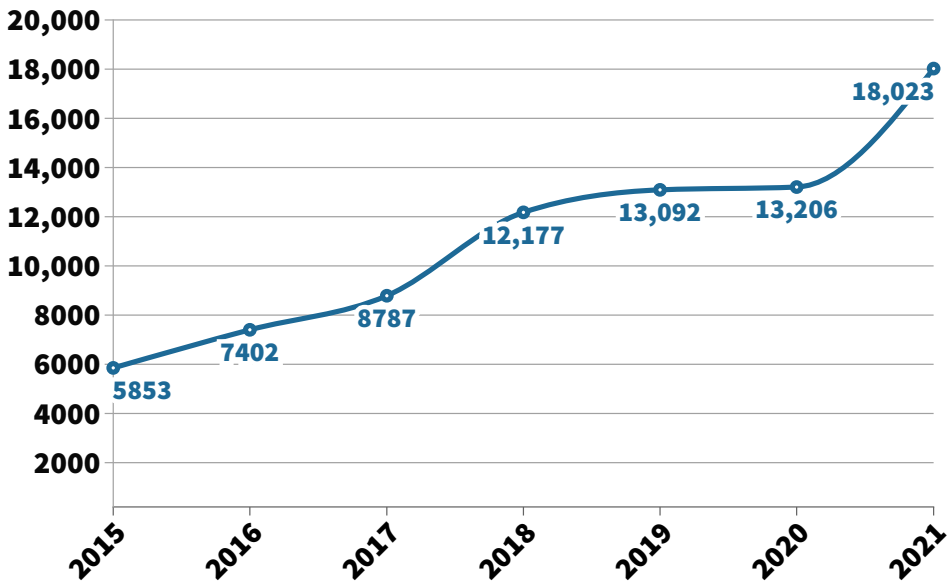
As of 2022, eBird holds over one billion global records. Beginning in 1976, over 1.3 million individual bird records have been submitted to eBird from the NCWAS four-county area (Chelan, Douglas, Ferry, and Okanogan). eBird submissions from the four-county area were modest until about 2010. Substantial use of eBird in the four-county area began in 2015. This paper uses the period from 2015 through June 2022 unless otherwise noted.

Use of eBird continues to grow as community science efforts add new observers, areas, and bird sightings. Two measures of the growth of eBird use in the NCWAS area are shown in the charts below.

Number of Observers



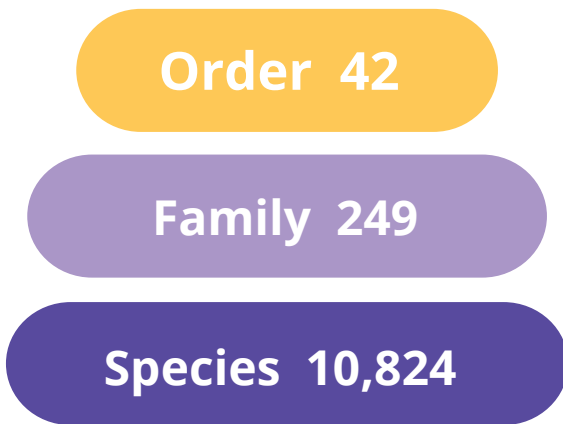
Number of Checklists



Avian taxonomy is constantly evolving. eBird uses the Clements Checklist of Birds of the World. The Washington Ornithological Society (WOS) publishes a list of all bird species found in Washington state. The taxonomic list used in this paper merges the most recent Clements list with the WOS list to produce a list that is patterned on Clements but shows only species occurring in Washington state. A complete list of the 306 bird species seen in the NCWAS four-county area between 2015 - July 31, 2022 is included at the end of this paper.

The graphics in this paper concentrate on three levels within the taxonomic structure: Order, Family, and Species. For graphic simplicity, species were omitted from some of the graphics. Except where noted, graphics use eBird data from 2015- June 30, 2022.

Global Bird Populations



Source: Clements, 2021

Washington State Bird Populations



Source: modified Clements/WOS

NCWAS Bird Populations



Source: modified Clements/WOS
eBird: 2015 - July 31, 2022

WHO? Which bird species have been seen in the NCWAS four-county area and reported to eBird?

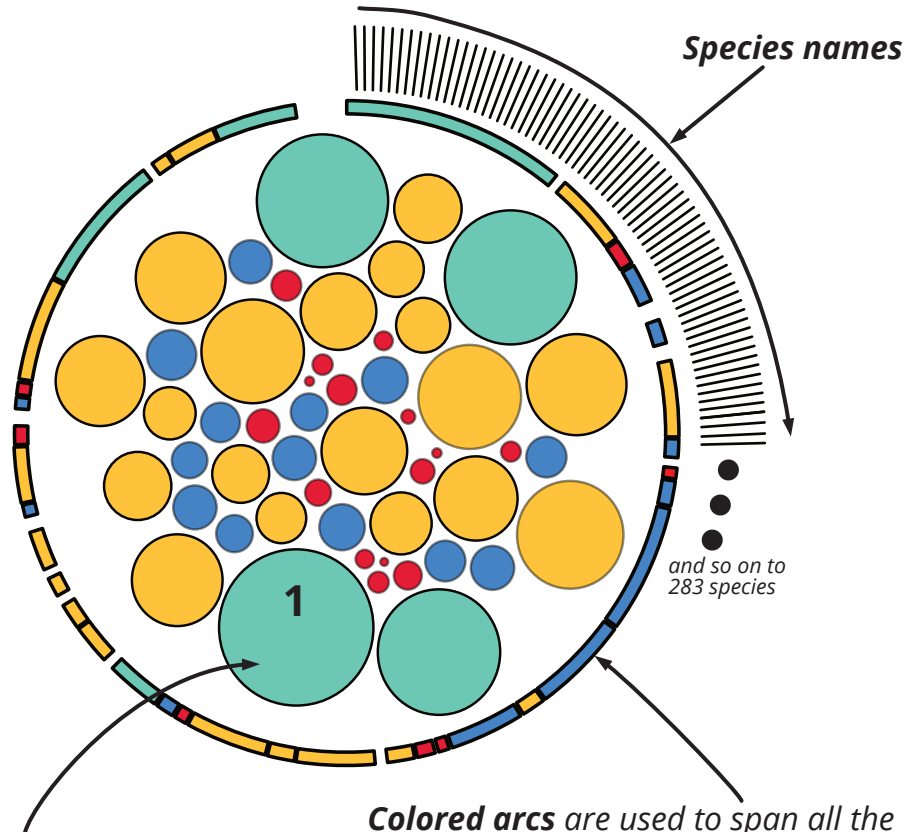
Displaying the numerous bird species found in North Central Washington is challenging. The starburst diagram on pages 5-6 attempts to streamline the task.

The diagram below explains how to interpret the graphic on pages 5 and 6. The names of 283 species radiate around the circle. They are organized into taxonomic families which are shown sequentially, clock-wise. Each family has an index number. Colors indicate four categories which are based on the number of observations of species within a family.

Family Index

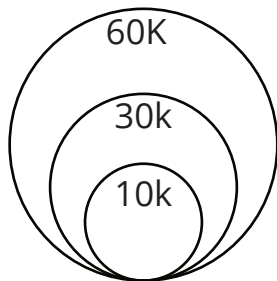
52 families are numbered and color-coded on the left side of the diagram

- 1 Waterfowl
- 2 New World Quail
- 3 Pheasants, Grouse
- and so on



Circles represent taxonomic families. Circle size indicates the total number of species observations within a family. Circle sizes are proportional to each other.

Colored arcs are used to span all the species in a family. The total number of observations in each family are grouped into four colored categories as shown below. Each arc contains a number that corresponds to the family index shown on the left side of the diagram.



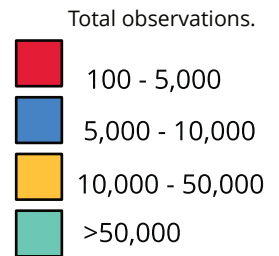
Families are grouped into four color-coded categories based on the total number of observations within a family.

Total number of observations

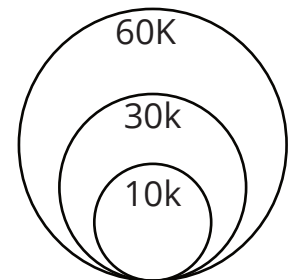
- 100 - 5,000
- 5,000 - 10,000
- 10,000 - 50,000
- >50,000

Family Index

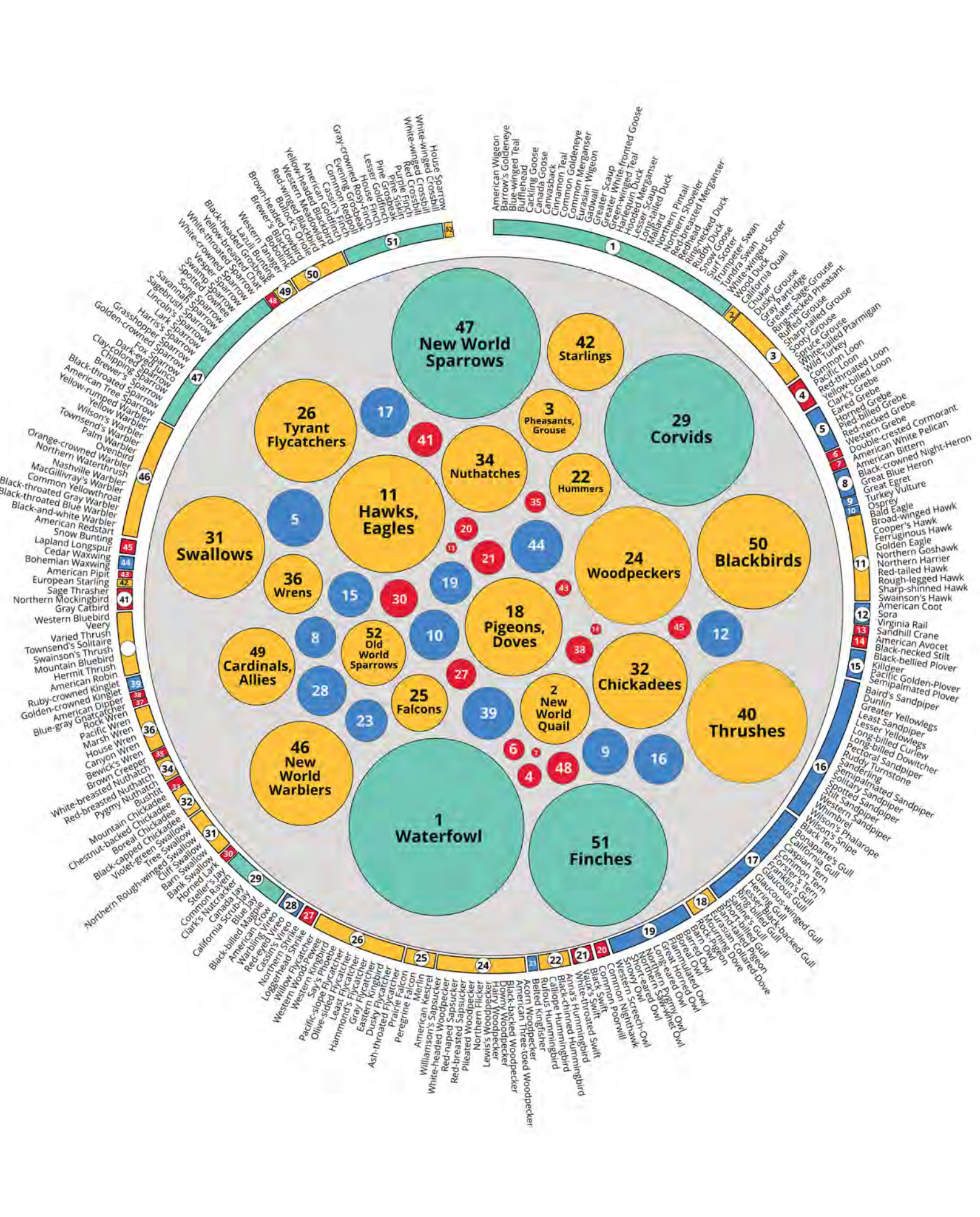
- 1 Waterfowl
- 2 New World Quail
- 3 Pheasants, Grouse
- 4 Loons
- 5 Grebes
- 6 Cormorants
- 7 Pelicans
- 8 Herons, Egrets
- 9 Vultures
- 10 Osprey
- 11 Hawks, Eagles
- 12 Rails
- 13 Cranes
- 14 Stilts, Avocets
- 15 Plovers
- 16 Sandpipers
- 17 Gulls, Terns
- 18 Pigeons, Doves
- 19 Owls
- 20 Nightjars
- 21 Swifts
- 22 Hummingbirds
- 23 Kingfishers
- 24 Woodpeckers
- 25 Falcons
- 26 Tyrant Flycatchers
- 27 Shrikes
- 28 Vireos
- 29 Corvids
- 30 Larks
- 31 Swallows
- 32 Chickadees
- 33 Bushtits
- 34 Nuthatches
- 35 Treecreepers
- 36 Wriens
- 37 Gnatcatchers
- 38 Dippers
- 39 Kinglets
- 40 Thrushes
- 41 Catbirds, Thrashers
- 42 Starlings
- 43 Pipits
- 44 Waxwings
- 45 Longspurs, Snow Buntings
- 46 New World Warblers
- 47 New World Sparrows
- 48 Yellow-breasted Chat
- 49 Cardinals & Allies
- 50 Blackbirds
- 51 Finches
- 52 Old World Sparrows



Circle size represents the total number of observations.



Rare Sightings 23 species are not included due to low numbers of observations: Black Scoter, Common Eider, Ross's Goose, White-faced Ibis, Red-shouldered Hawk, American Golden-Plover, Marbled Godwit, Short-billed Dowitcher, Willet, Parasitic Jaeger, Iceland Gull, Yellow-billed Cuckoo, Yellow-bellied Sapsucker, Yellow-billed Cuckoo, Purple Martin, Brown Thrasher, Chestnut-sided Warbler, Magnolia Warbler, Northern Parula, Tennessee Warbler, Rose-breasted Grosbeak, Rusty Blackbird, Tricolored Blackbird, Hoary Redpoll



Common Birds of North Central Washington

North Central Washington Audubon Society

P.O. Box 2934, Wenatchee, WA 98807

www.ncwaudubon.org



This poster is intended for noncommercial educational and information purposes only. Bird size and Spanish names from Cornell Lab of Ornithology, www.allaboutbirds.org
Design and layout by Bruce McCammon 2020. Illustrations are based on photography by Bruce McCammon

December 2020 v11.0

This graphic is available as a hardcopy 11x17" poster. Please send an email to ncwaudubon@gmail.org to request one.

WHEN?

Migrant species (global and altitudinal) mix with resident and vagrant species in North Central Washington. When do they show up?

eBird provides bar charts to show species presence in an area. Each small block represents one week.

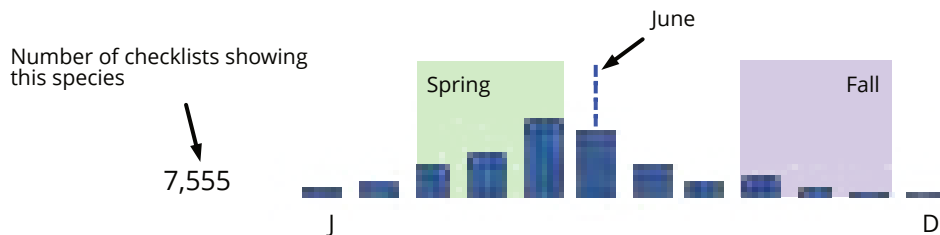
The size of each weekly block represents the species' relative abundance each week. The charts show a tapering in as the species arrives and a tapering out as it leaves. Some species, like the European Starling, are present in large numbers all year.



The charts on the following pages illustrate the seasonality and relative abundance for selected bird families within the NCWAS area. To allow all the species to be seen in one view, a time period of one month is used rather than the one week period used by eBird.

Several annotations are included to help navigate through the charts. Shaded bars highlight two of NCWA's four seasons: Spring and Fall. A vertical dashed line appears at the center of the June blocks. January and December labels are shown at each end of the chart. The total number of times that checklists include a species is documented at the far left side of each species's chart. All the species are grouped into forty-nine taxonomic families.

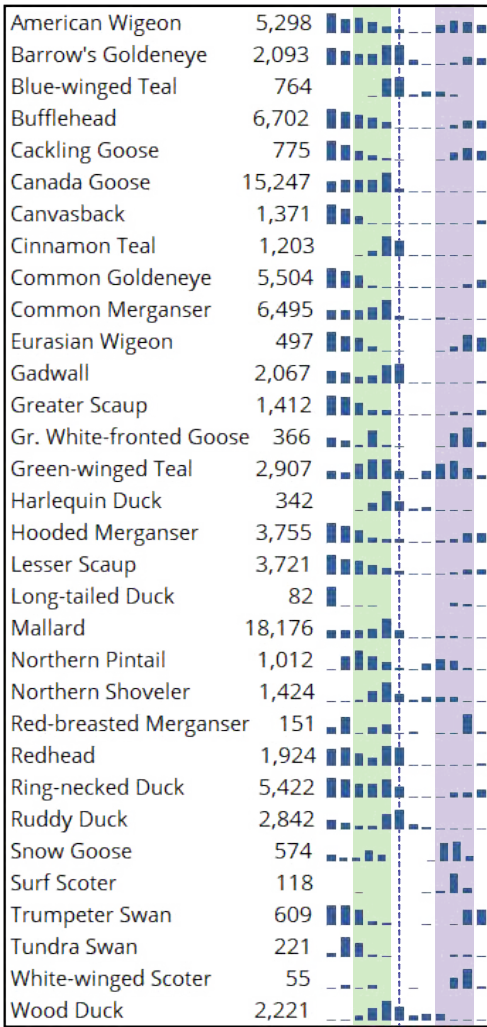
Family index numbers used in the previous chart reappear in these diagrams.



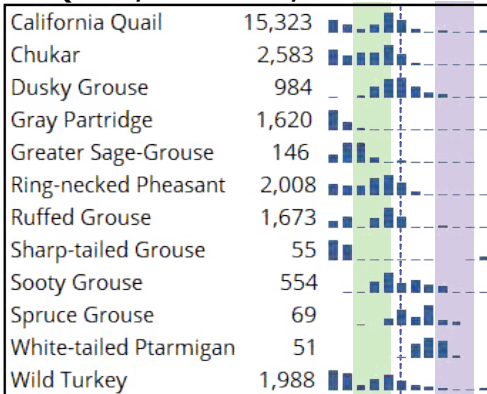
Seasonality of Select North Central

Family group number

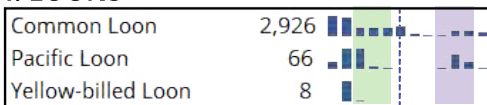
1. WATERFOWL



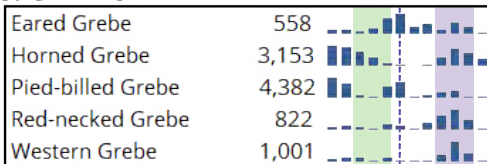
2-3. QUAIL, PHEASANT, GROUSE



4. LOONS



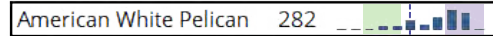
5. GREBES



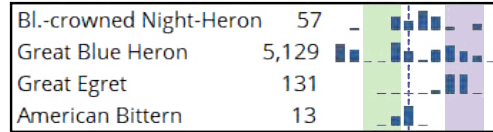
6. CORMORANTS



7. PELICANS



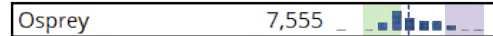
8. HERONS, EGRETS



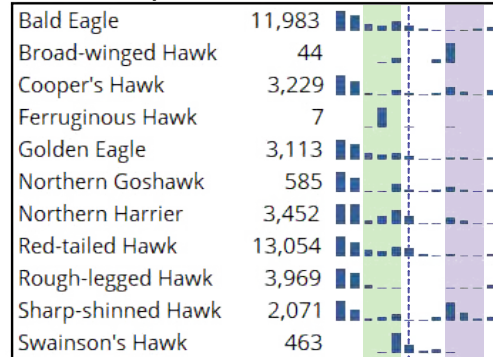
9. VULTURE



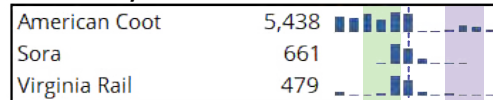
10. OSPREY



11. HAWKS, EAGLES



12. RAILS, COOTS



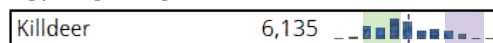
13. CRANES



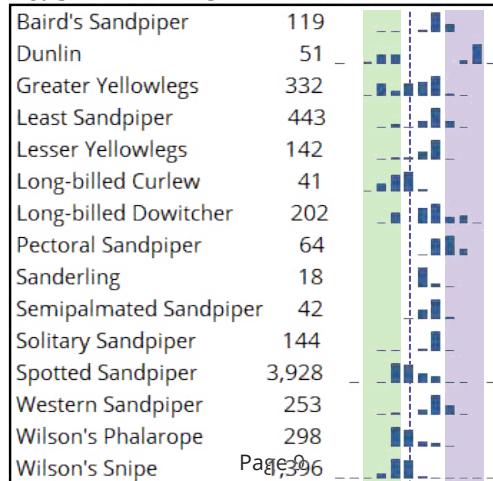
14. AVOCETS, STILTS



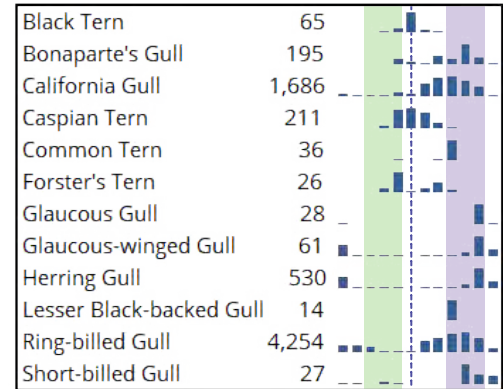
15. PLOVERS



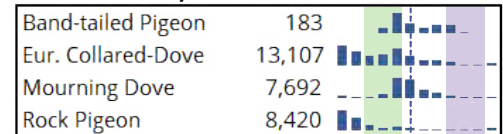
16. SANDPIPERS



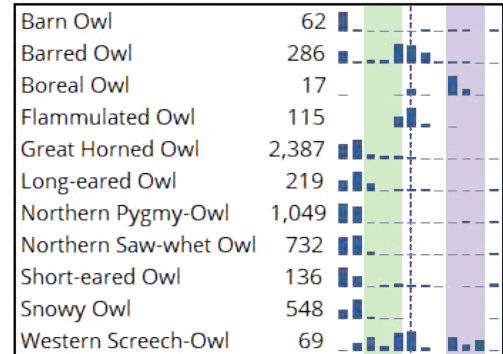
17. GULLS, TERNS



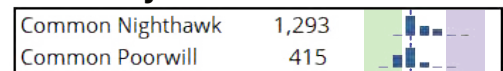
18. PIGEONS, DOVES



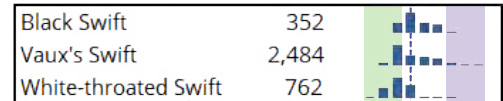
19. OWLS



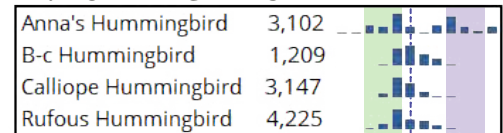
20. NIGHTJARS



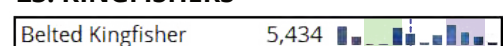
21. SWIFTS



22. HUMMINGBIRDS

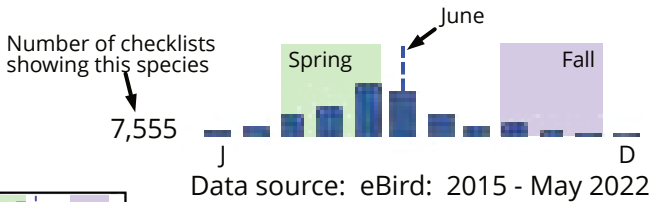


23. KINGFISHERS



** Family groups 33 and 37 omitted purposefully due to low number of observations. Some species have been omitted due to low numbers of observations.

Washington Birds



24. WOODPECKERS

Acorn Woodpecker	65	
Am. Three-toed WP	258	
Black-backed WP	267	
Downy Woodpecker	5,991	
Hairy Woodpecker	4,984	
Lewis's Woodpecker	1,268	
Northern Flicker	21,719	
Pileated Woodpecker	2,846	
Red-breasted Sapsucker	276	
Red-naped Sapsucker	2,460	
W-H Woodpecker	1,836	
Williamson's Sapsucker	741	

25. FALCONS

American Kestrel	7,299	
Merlin	1,344	
Peregrine Falcon	662	
Prairie Falcon	787	

26. TYRANT FLYCATCHERS

Ash-throated Flycatcher	93	
Dusky Flycatcher	2,926	
Eastern Kingbird	4,020	
Gray Flycatcher	521	
Hammond's Flycatcher	2,115	
Least Flycatcher	168	
Olive-sided Flycatcher	1,239	
Pacific-slope Flycatcher	1,123	
Say's Phoebe	6,848	
Western Kingbird	3,467	
Western Wood-Pewee	8,584	
Willow Flycatcher	1,431	

27. SHRIKES

Loggerhead Shrike	247	
Northern Shrike	2,371	

28. VIREOS

Cassin's Vireo	2,645	
Red-eyed Vireo	557	
Warbling Vireo	4,685	

29. CORVIDS

American Crow	18,350	
Black-billed Magpie	10,627	
Blue Jay	128	
California Scrub-jay	71	
Canada Jay	1,559	
Clark's Nutcracker	3,813	
Common Raven	23,783	
Steller's Jay	12,591	

30. LARKS

Horned Lark	4,420	
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31. SWALLOWS

Bank Swallow	1,189	
Barn Swallow	5,346	
Cliff Swallow	3,217	
N. R.-winged Swallow	3,122	
Tree Swallow	7,994	
Violet-green Swallow	11,675	

32. CHICKADEES

B.-capped Chickadee	17,255	
Boreal Chickadee	76	
C.-backed Chickadee	1,603	
Mountain Chickadee	9,141	

** 34. NUTHATCHS

Pygmy Nuthatch	3,370	
Red-breasted Nuthatch	16,685	
White-breasted Nuthatch	2,536	

35. TREECREEPERS

Brown Creeper	1,445	
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36. WRENS

Bewick's Wren	1,387	
Canyon Wren	1,108	
House Wren	5,411	
Marsh Wren	577	
Pacific Wren	1,455	
Rock Wren	888	

** 38. DIPPERS

American Dipper	2,362	
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39. KINGLETS

Golden-crowned Kinglet	2,963	
Ruby-crowned Kinglet	5,395	

40. THRUSHES

American Robin	28,518	
Hermit Thrush	1,874	
Mountain Bluebird	2,429	
Swainson's Thrush	3,092	
Townsend's Solitaire	2,206	
Varied Thrush	3,270	
Veery	1,467	
Western Bluebird	2,604	

41. CATBIRDS, THRASHERS

Gray Catbird	3,407	
Sage Thrasher	599	

42. STARLINGS

European Starling	18,235	
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43. PIPITS

American Pipit	737	
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44. WAXWINGS

Bohemian Waxwing	774	
Cedar Waxwing	7,545	

46. WARBLERS

American Redstart	224	
Black-th. Gray Warbler	177	
Common Yellowthroat	2,248	
MacGillivray's Warbler	2,848	
Nashville Warbler	3,842	
Northern Waterthrush	100	
Or.-crowned Warbler	1,750	
Townsend's Warbler	2,509	
Wilson's Warbler	1,871	
Yellow Warbler	7,377	
Y-rumped Warbler	10,414	

45. LONGSPURS, BUNTINGS

Lapland Longspur	154	
Snow Bunting	1,378	

47. NEW WORLD SPARROWS

American Tree Sparrow	757	
Brewer's Sparrow	1,355	
Chipping Sparrow	6,373	
Clay-colored Sparrow	88	
Dark-eyed Junco	16,271	
Fox Sparrow	440	
Golden-crowned Sparrow	962	
Grasshopper Sparrow	300	
Harris's Sparrow	138	
Lark Sparrow	862	
Lincoln's Sparrow	895	
Sagebrush Sparrow	266	
Savannah Sparrow	1,466	
Song Sparrow	15,837	
Spotted Towhee	11,735	
Swamp Sparrow	44	
Vesper Sparrow	2,777	
White-crowned Sparrow	9,527	
White-throated Sparrow	71	

48. YELLOW-BREASTED CHAT

Yellow-breasted Chat	1,683	
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49. CARDINALS & ALLIES

Black-headed Grosbeak	5,374	
Lazuli Bunting	4,464	
Western Tanager	8,185	

50. BLACKBIRDS

Bobolink	224	
Brewer's Blackbird	5,651	
Brown-headed Cowbird	7,110	
Bullock's Oriole	4,636	
Red-winged Blackbird	14,509	
Western Meadowlark	6,949	
Yell.-headed Blackbird	1,548	

51. FINCHES

American Goldfinch	15,941	
Cassin's Finch	6,650	
Common Redpoll	828	
Evening Grosbeak	3,325	
Gray-crowned Rosy-Finch	421	
House Finch	15,227	
Lesser Goldfinch	502	
Pine Grosbeak	616	
Pine Siskin	11,169	
Purple Finch	2,912	
Red Crossbill	3,035	
White-winged Crossbill	220	

52. OLD-WORLD SPARROWS

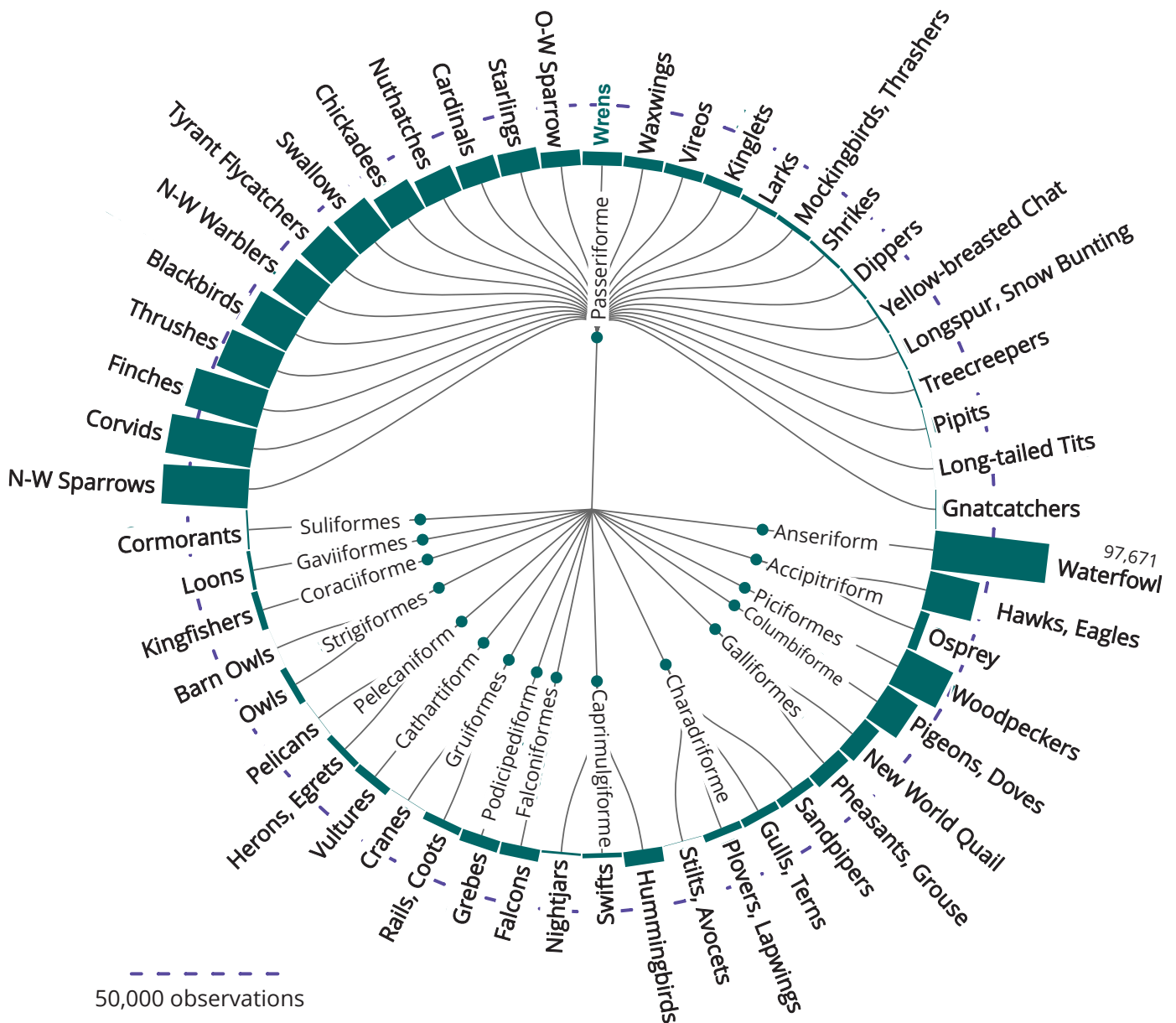
House Sparrow	12,905	
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HOW MANY?

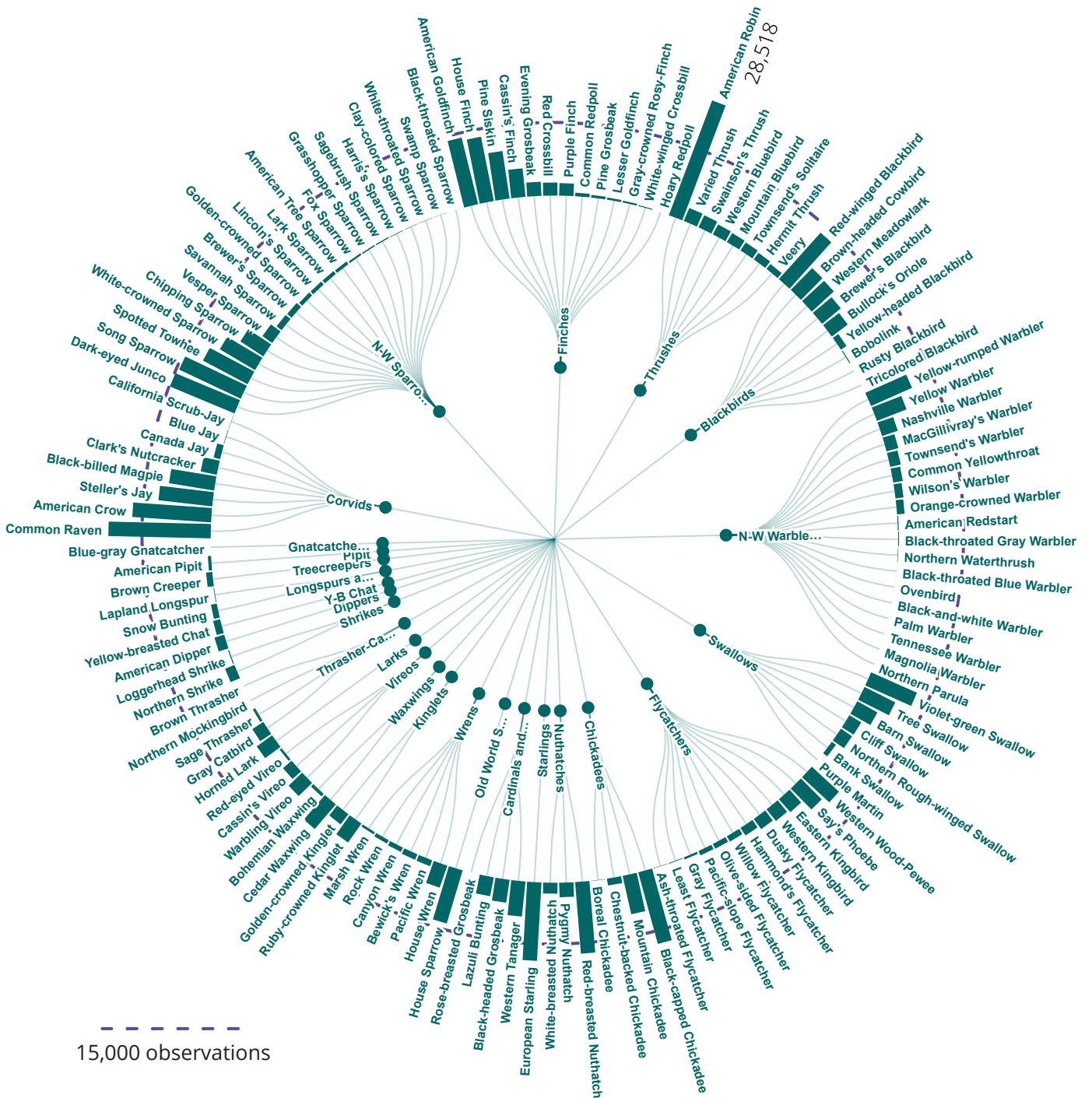
Estimating the number of birds in a large flock is challenging and frequently imprecise. Is it possible back up a bit to use the number of species observations within a family of birds rather than the total number of individuals?

Seventeen taxonomic orders occupy the center of the circle below and form the hubs for all the families within an order. Fifty-three taxonomic families radiate outward from the orders. The family bars do NOT show absolute values for the number of observations within a family. Rather, each bar is scaled proportionally to the bar representing the maximum number of observations (Waterfowl, below). This type of display facilitates comparison between families. It is evident that the entire top half of the circle is occupied by families within the Passerine order.

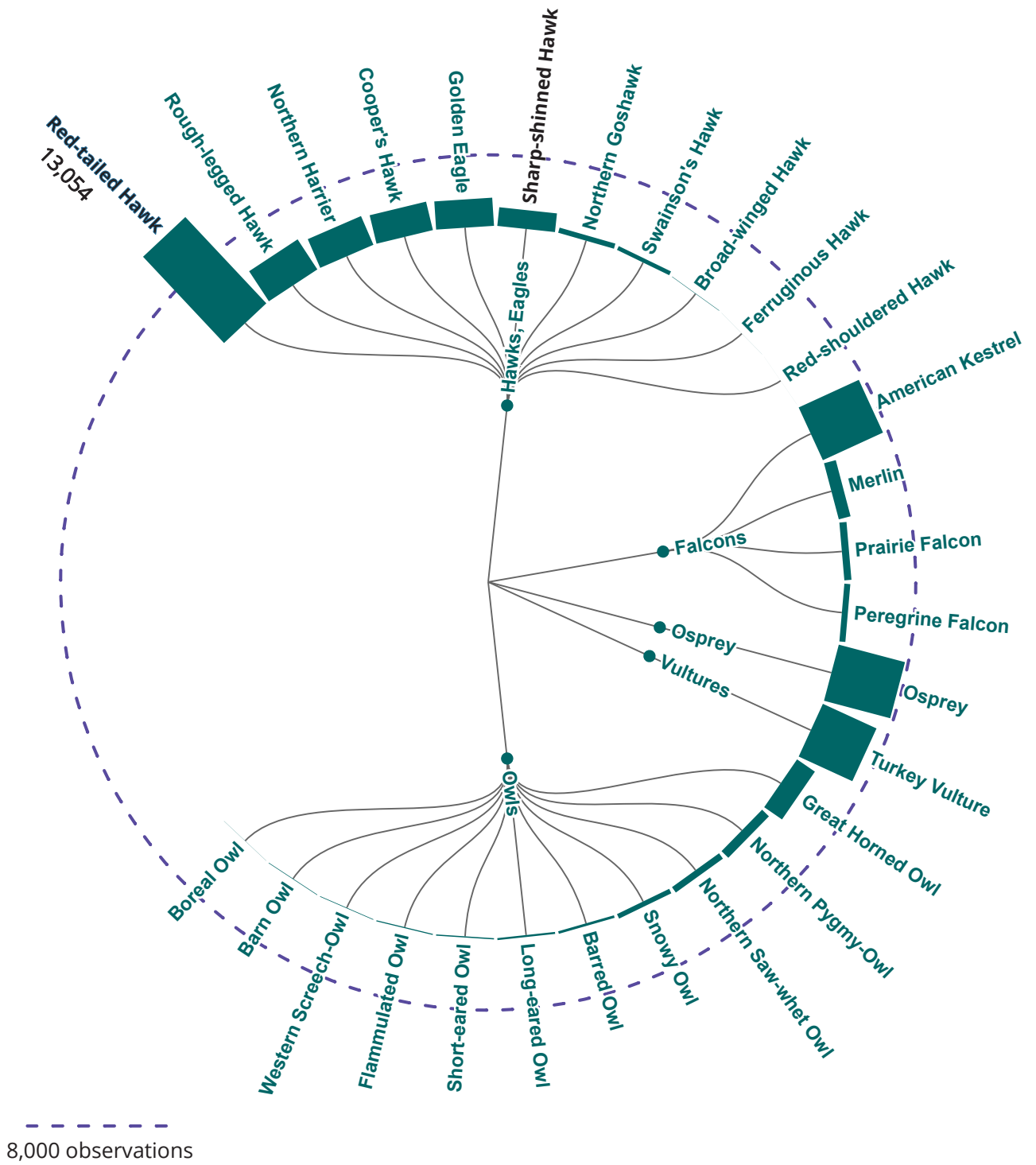
A dotted line provides a scale for comparison between each family block. For reference, the magnitude of the largest block is noted (e.g., Waterfowl, 97,671). Species totals are found in the table on pages 9-10..



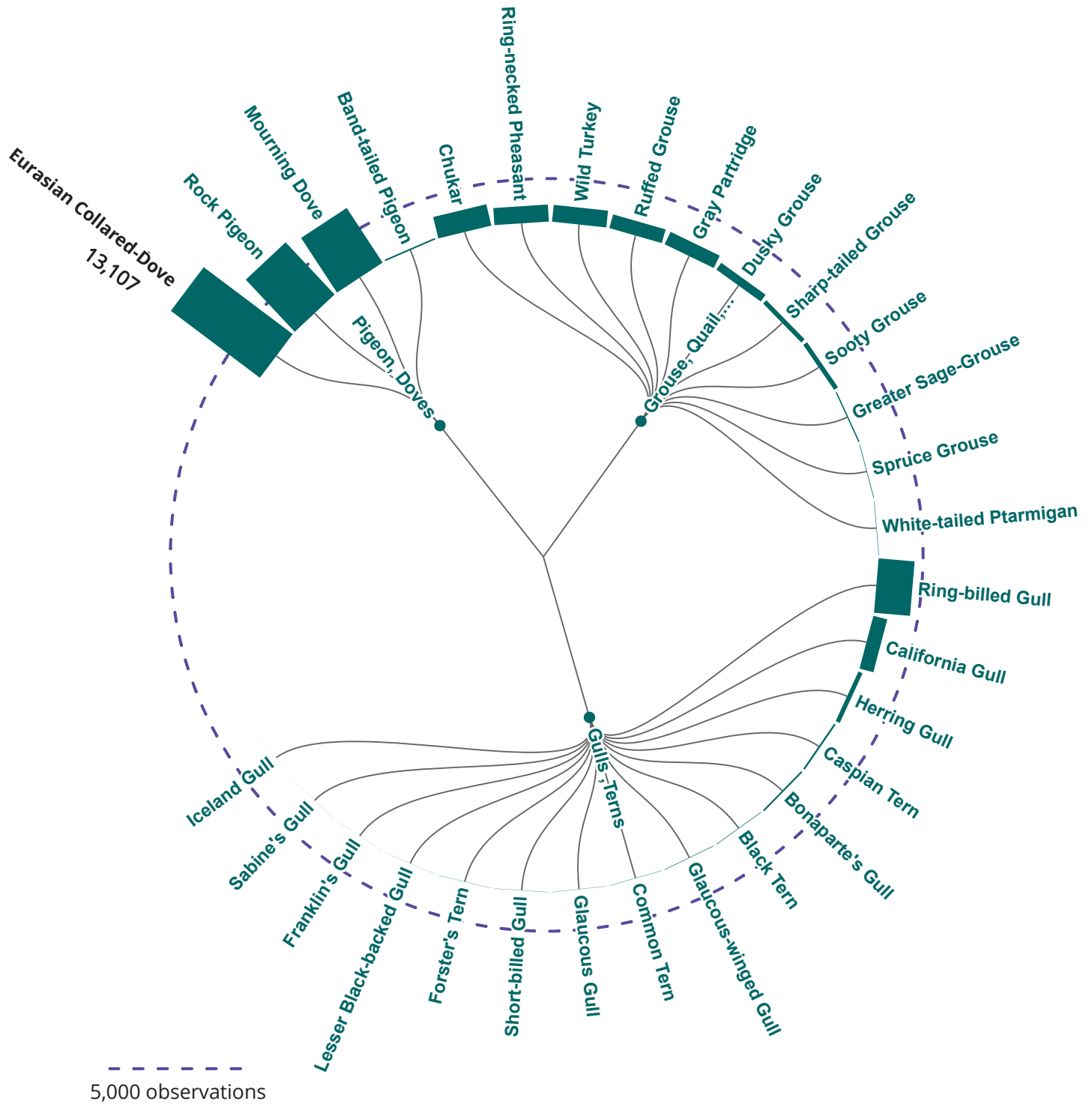
Passerines



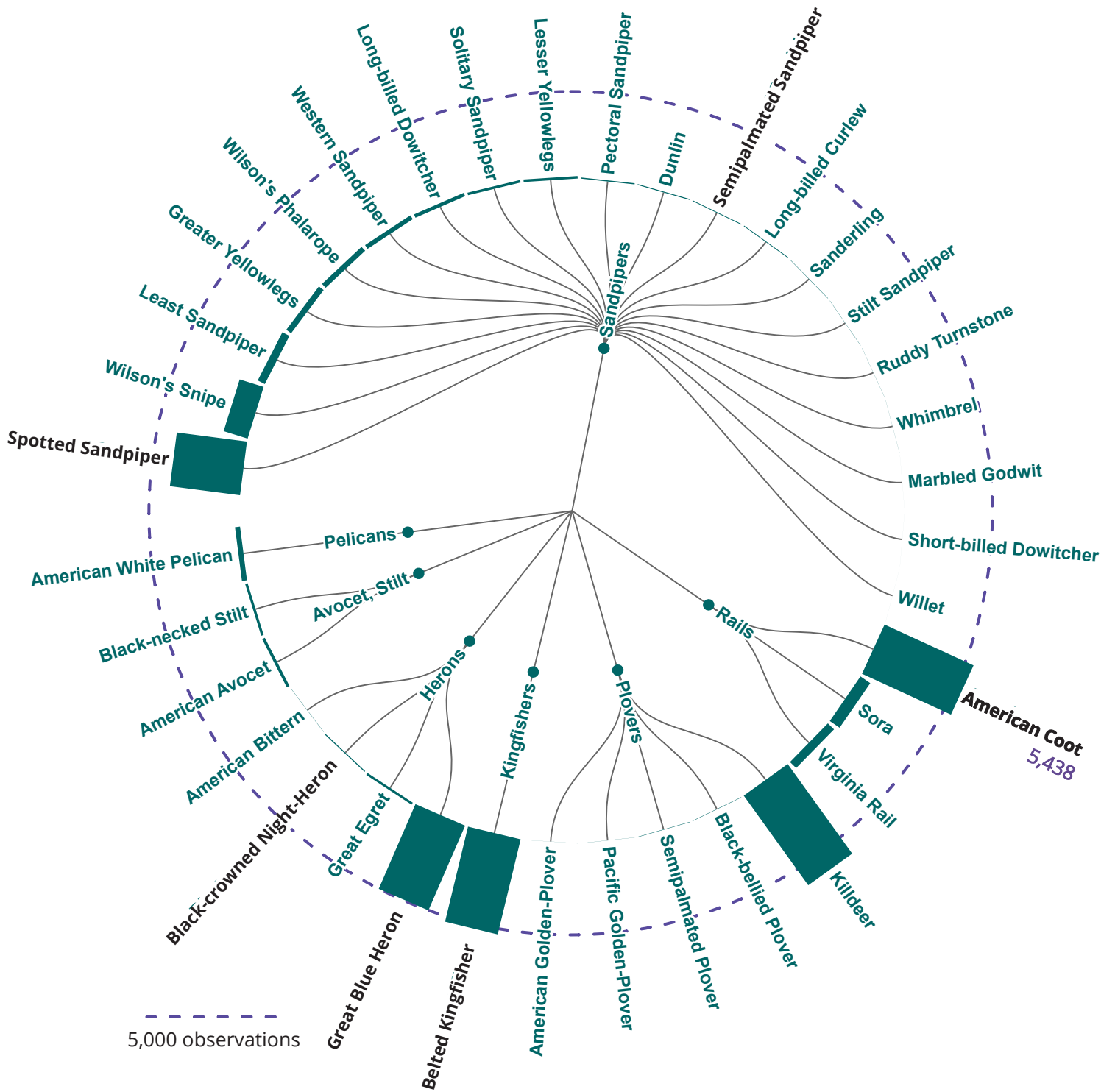
Birds of Prey



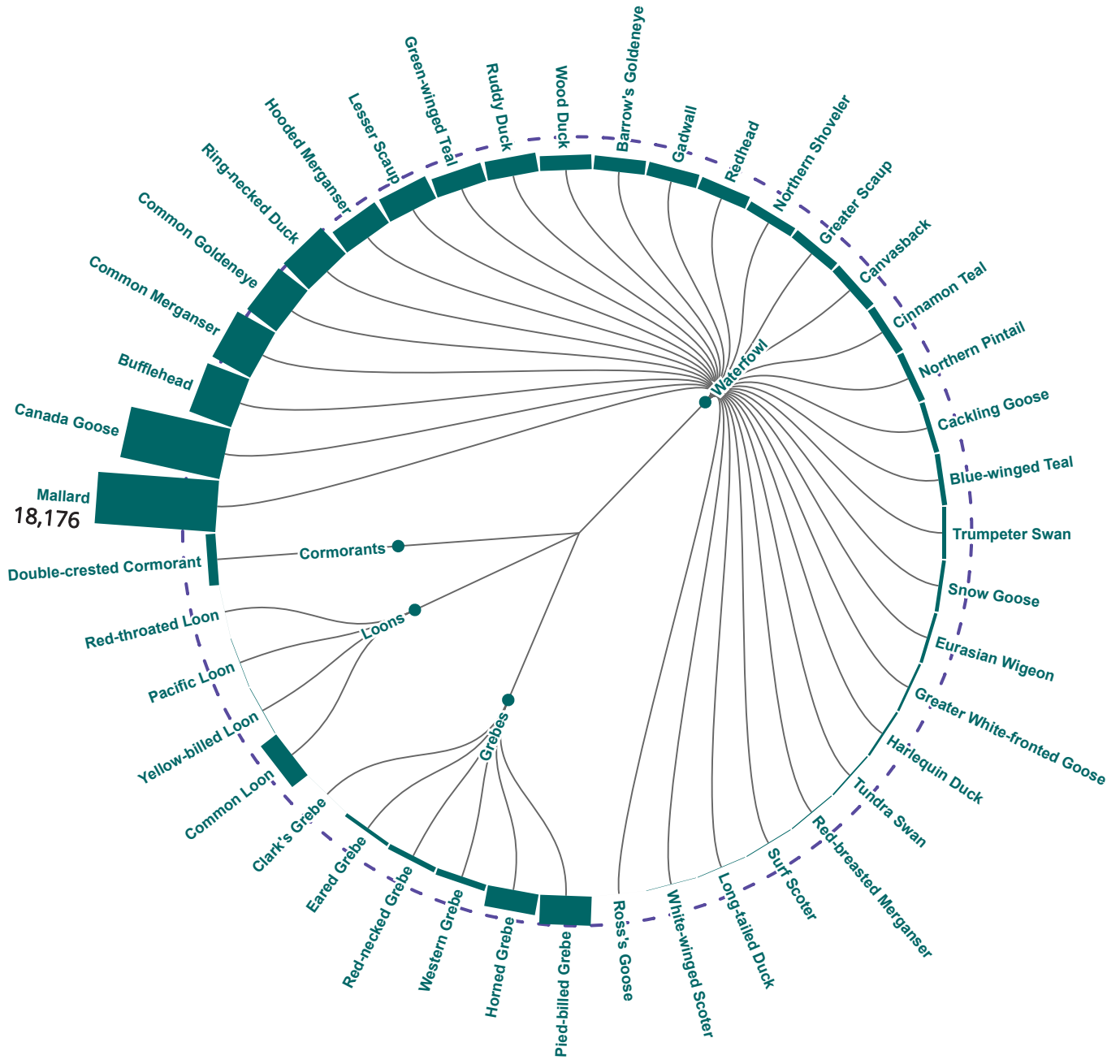
Doves, Grouse, Gulls, Terns



Sandpipers, Rails, Plovers, Herons

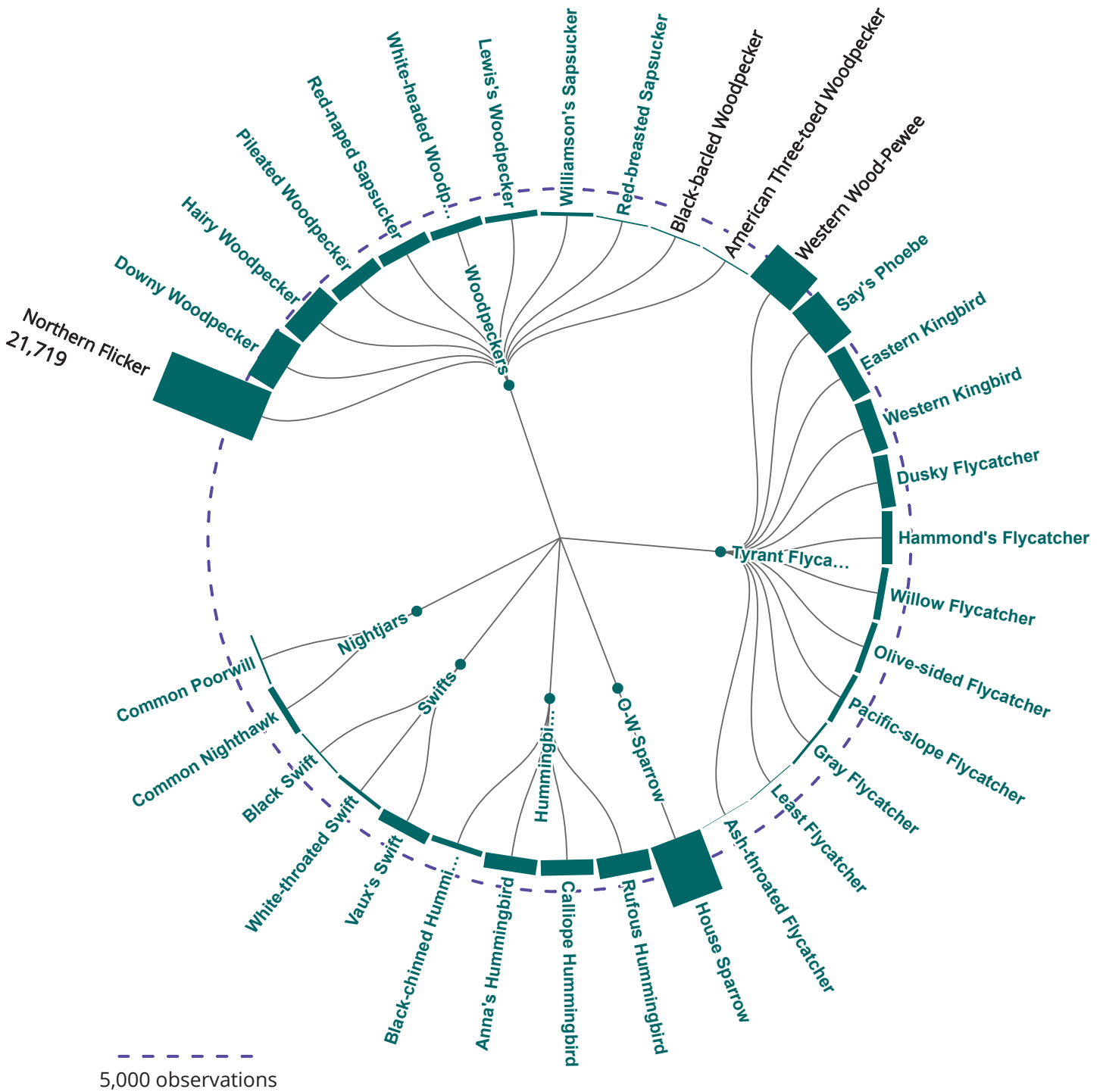


Waterfowl, Grebes, Loons



5,000 observations

Woodpeckers, Flycatchers, Hummingbirds, Nightjars



WHERE?

Bird observations in eBird depend on birds being present and the willingness and ability of humans to be there to see them.

As the saying goes - "location, location, location". Birds in North Central Washington are found in a wide variety of habitat-driven locations: shorelines, tree canopies, marshes, shrub-steppe communities, ponds, lakes, and rivers to name a few. The birds act instinctively to find cover, forage, and locations for reproduction. Humans travel on roads, trails, or water to access bird watching areas.

A word about eBird locations

An eBird checklist is the fundamental mechanism used to submit bird observations to eBird. Each checklist, be it a stationary point count or traveling route, is associated with a single locality. This is not to be confused with the specific geographic location assigned to each species within a checklist. If you record your observations using the eBird mobile app, each time you tick a species, the latitude and longitude is recorded. The checklist you submit to eBird, however, is tied to one locality which has its own geographic coordinates.

Within eBird, your checklist location is referred to as a locality. Localities are categorized as: Personal, Hotspot, or Town. The eBird records for the NCWAS four-county area (2015- June 2022) reveal a total of 15,246 unique locations: 14,638 personal locations, 588 Hotspot locations, and 26 Town localities. Each locality has a unique name, geographic location, and eBird ID. As a general practice, it is wise to select an existing location for your checklist. Doing so minimizes the number of isolated, one-off checklist sites. Ninety percent of the localities have five or fewer checklists.

Localities become Hotspots after a request for that designation is made to eBird staff. Hotspots are publicly accessible locations that people frequently visit to bird. Four percent of all locations are Hotspots yet forty-three percent of all species seen in the four-county area are tied to them. The 588 Hotspots are shown on the map on page 19. Inspection of the map reveals that many of the Hotspots follow road or river corridors.

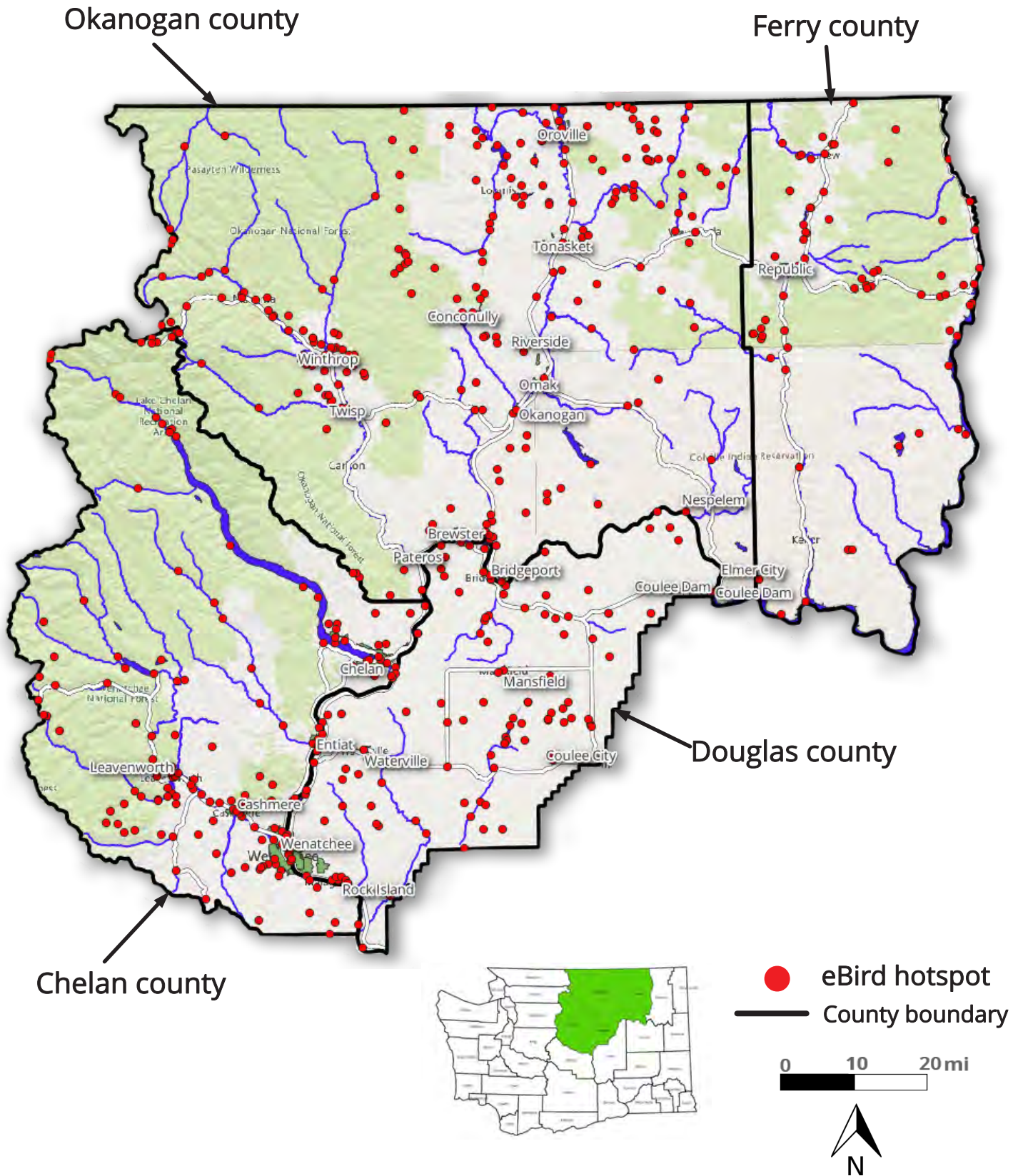
Being a Hotspot does not mean that the area/site will always have abundant birds. However, in the NCWAS four-county area, data from the top ten Hotspots all show more than 184 species.

Factors that affect a person's ability to see a bird in the field include land ownership, road or trail access, and character of the terrain. eBirders respect private land ownership and either ask for permission to enter or avoid private lands (right?). A majority of the hotspots are on or very near to roads or trails. A few are on water. It is much more rare for a person to bushwhack through an area to see and record birds, especially if the terrain is steep.

Factors that affect a bird's ability or willingness to be in any given location include: habitat (foraging, cover, breeding), climate (long-term), weather (short-term), and migration instinct. Much of the native habitat in the NCWAS area has been converted to agriculture or fragmented by roads and vegetative harvest or conversion to agriculture. The Washington Department of Fish and Wildlife (Dobler, et. al, 1996) states that forty-one percent of Washington State's native shrub-steppe area has been lost. Of the remaining shrub-steppe lands, seventy-four percent is in private ownership.

Fredrick C. Dobler, J. Eby, C. Perry, S. Richardson, and M. Vander Haegen, *Status of Washington's Shrub-Steppe Ecosystem: Extent, ownership and wildlife/vegetation relationships*, WDFW, August 1996.

eBird Hotspot Locations



Observations

The charts in this paper provide opportunities to discover some interesting insights. They also raise questions. After a close look at the four sections in the report, the following observations and questions are offered as a starting point for reader exploration.

WHO?

- In terms of the total number of observations, the four largest families (Waterfowl, New World Sparrows, Corvids, and Finches) contain nearly 25 percent of the total number of species in North Central Washington and 33 percent of the total number of observations.
- The largest family, Waterfowl, contains 34 species and 10.5 percent of all observations.
- There are 19 families with a single species reported to eBird: Osprey, Vultures, Jaegers, Kingfisher, New World Quail, Cranes, Long-tailed Tits, Larks, Treecreepers, Dippers, Yellow-breasted Chat, Pipits, Old World Sparrows, Gnatcatchers, Starlings, Pelicans, Ibis, Barn Owls, Cormorants.
- 8 families contain nearly 50% of the species in North Central Washington. They are: Waterfowl, Sandpipers, New World Sparrows, New World Warblers, Gulls and Terns, Finches, Woodpeckers, Hawks and Eagles

WHEN?

- American Wigeon and Green-winged Teal show a bi-modal seasonality.
- California Quail are infrequently reported in late summer and fall periods.
- Eurasian Collared-Doves are present more of the year than Mourning Doves.
- Why aren't Rock Pigeons reported all year?
- While most owl species appear to be winter birds, the Western Screech-Owl is seen and reported much of the year, although at a low frequency.
- The year-round presence of Anna's Hummingbirds is clearly shown with an unanticipated absence in July.
- Flycatchers are truly spring and summer birds.
- Northern Shrikes are winter birds. Loggerhead are most common in spring and summer.
- New World Warblers do not show an increase in observations during fall migration.

HOW MANY?

- The Passerine order contains 27 families and 136 species. That is about 45 percent of the total number of species seen in North Central Washington.
- The Waterfowl family contains 34 species and 10.5 percent of all observations.
- The Sandpiper family contains 22 species and less than one percent of all observations.

WHERE?

- There are a surprising number of Hotspots in lightly populated Ferry county.
- GIS allows one to zoom in to look closely at Hotspot locations relative to roads. Virtually all Hotspots are adjacent to roads. Others are presumed to be adjacent to trails.
- Rare bird sightings will draw people to an area but it is unknown how far people will drive to bird casually.

A Complete List of the 306 Bird Species in North Central Washington

eBird: 2015 - July 31, 2022

Waterfowl

American Wigeon
Barrow's Goldeneye
Black Scoter
Blue-winged Teal
Bufflehead
Cackling Goose
Canada Goose
Canvasback
Cinnamon Teal
Common Eider
Common Goldeneye
Common Merganser
Eurasian Wigeon
Gadwall
Greater Scaup
Greater White-fronted Goose
Green-winged Teal
Harlequin Duck
Hooded Merganser
Lesser Scaup
Long-tailed Duck
Mallard
Northern Pintail
Northern Shoveler
Red-breasted Merganser
Redhead
Ring-necked Duck
Ross's Goose
Ruddy Duck
Snow Goose
Surf Scoter
Trumpeter Swan
Tundra Swan
White-winged Scoter
Wood Duck

Grouse, Quail, and Allies

California Quail
Chukar
Dusky Grouse
Gray Partridge
Greater Sage-Grouse
Ring-necked Pheasant
Ruffed Grouse
Sharp-tailed Grouse
Sooty Grouse
Spruce Grouse
White-tailed Ptarmigan
Wild Turkey

Loons

Common Loon
Pacific Loon
Red-throated Loon
Yellow-billed Loon

Grebes

Clark's Grebe
Eared Grebe
Horned Grebe
Pied-billed Grebe
Red-necked Grebe
Western Grebe

Cormorants and Anhingas

Double-crested Cormorant

Pelicans

American White Pelican

Hérons, Ibis, and Allies

Black-crowned Night-Heron
Great Blue Heron
Great Egret
American Bittern
White-faced Ibis

Vultures, Hawks, and Allies

Turkey Vulture

Osprey

Osprey

Vultures, Hawks, and Allies

Bald Eagle
Broad-winged Hawk
Cooper's Hawk
Ferruginous Hawk
Golden Eagle
Northern Goshawk
Northern Harrier
Red-shouldered Hawk
Red-tailed Hawk
Rough-legged Hawk
Sharp-shinned Hawk
Swainson's Hawk

Rails, Gallinules, and Allies

American Coot
Sora
Virginia Rail

Cranes

Sandhill Crane

Shorebirds

American Avocet
Black-necked Stilt
American Golden-Plover
Black-bellied Plover
Killdeer
Pacific Golden-Plover
Semipalmated Plover
Baird's Sandpiper
Dunlin
Greater Yellowlegs
Least Sandpiper
Lesser Yellowlegs
Long-billed Curlew
Long-billed Dowitcher
Marbled Godwit
Pectoral Sandpiper
Ruddy Turnstone
Sanderling
Semipalmated Sandpiper
Short-billed Dowitcher
Solitary Sandpiper
Spotted Sandpiper
Stilt Sandpiper
Western Sandpiper
Whimbrel
Willet
Wilson's Phalarope
Wilson's Snipe

Skuas and Jaegers

Parasitic Jaeger

Gulls, Terns, and Skimmers

Black Tern
Bonaparte's Gull
California Gull
Caspian Tern
Common Tern
Forster's Tern
Franklin's Gull
Glaucous Gull
Glaucous-winged Gull
Herring Gull
Iceland Gull
Lesser Black-backed Gull
Ring-billed Gull
Sabine's Gull
Short-billed Gull

Pigeons and Doves

Band-tailed Pigeon
 Eurasian Collared-Dove
 Mourning Dove
 Rock Pigeon

Cuckoos

Yellow-billed Cuckoo

Owls

Barn Owl
 Barred Owl
 Boreal Owl
 Flammulated Owl
 Great Horned Owl
 Long-eared Owl
 Northern Pygmy-Owl
 Northern Saw-whet Owl
 Short-eared Owl
 Snowy Owl
 Western Screech-Owl

Nightjars

Common Nighthawk
 Common Poorwill

Swifts

Black Swift
 Vaux's Swift
 White-throated Swift

Hummingbirds

Anna's Hummingbird
 Black-chinned Hummingbird
 Calliope Hummingbird
 Rufous Hummingbird

Kingfishers

Belted Kingfisher

Woodpeckers

Acorn Woodpecker
 American Three-toed Woodpecker
 Black-backed Woodpecker
 Downy Woodpecker
 Hairy Woodpecker
 Lewis's Woodpecker
 Northern Flicker
 Pileated Woodpecker
 Red-breasted Sapsucker
 Red-naped Sapsucker
 White-headed Woodpecker
 Williamson's Sapsucker
 Yellow-bellied Sapsucker

Falcons and Caracaras

American Kestrel
 Merlin
 Peregrine Falcon
 Prairie Falcon

Tyrant Flycatchers: Pewees, Kingbirds

Ash-throated Flycatcher
 Dusky Flycatcher
 Eastern Kingbird
 Gray Flycatcher
 Hammond's Flycatcher
 Least Flycatcher
 Olive-sided Flycatcher
 Pacific-slope Flycatcher
 Say's Phoebe
 Western Kingbird
 Western Wood-Pewee
 Willow Flycatcher

Shrikes

Loggerhead Shrike
 Northern Shrike

Vireos

Cassin's Vireo
 Red-eyed Vireo
 Warbling Vireo

Jays, Magpies, Crows, and Ravens

American Crow
 Black-billed Magpie
 Blue Jay
 California Scrub-Jay
 Canada Jay
 Clark's Nutcracker
 Common Raven
 Steller's Jay

Larks

Horned Lark

Martins and Swallows

Bank Swallow
 Barn Swallow
 Cliff Swallow
 Northern Rough-winged Swallow
 Purple Martin
 Tree Swallow
 Violet-green Swallow

Tits, Chickadees, and Titmice

Black-capped Chickadee
 Boreal Chickadee
 Chestnut-backed Chickadee
 Mountain Chickadee

Long-tailed Tits and Bushtit

Bushtit

Nuthatches

Pygmy Nuthatch
 Red-breasted Nuthatch
 White-breasted Nuthatch

Treecreepers

Brown Creeper

Wrens

Bewick's Wren
 Canyon Wren
 House Wren
 Marsh Wren
 Pacific Wren
 Rock Wren

Gnatcatchers

Blue-gray Gnatcatcher

Dippers

American Dipper

Kinglets

Golden-crowned Kinglet
 Ruby-crowned Kinglet

Thrushes

American Robin
 Hermit Thrush
 Mountain Bluebird
 Swainson's Thrush
 Townsend's Solitaire
 Varied Thrush
 Veery
 Western Bluebird

Catbirds, Mockingbirds, and Thrashers

Brown Thrasher
 Gray Catbird
 Northern Mockingbird
 Sage Thrasher

Wagtails and Pipits

American Pipit

Waxwings

Bohemian Waxwing
 Cedar Waxwing

Longspurs and Snow Buntings

Lapland Longspur
 Snow Bunting

Wood-Warblers

American Redstart
Black-and-white Warbler
Black-throated Blue Warbler
Black-throated Gray Warbler
Chestnut-sided Warbler
Common Yellowthroat
MacGillivray's Warbler
Magnolia Warbler
Nashville Warbler
Northern Parula
Northern Waterthrush
Orange-crowned Warbler
Ovenbird
Palm Warbler
Tennessee Warbler
Townsend's Warbler
Wilson's Warbler
Yellow Warbler
Yellow-rumped Warbler

New World Sparrows

American Tree Sparrow
Black-throated Sparrow
Brewer's Sparrow
Chipping Sparrow
Clay-colored Sparrow
Dark-eyed Junco
Fox Sparrow
Golden-crowned Sparrow
Grasshopper Sparrow
Harris's Sparrow
Lark Sparrow
Lincoln's Sparrow
Sagebrush Sparrow
Savannah Sparrow
Song Sparrow
Spotted Towhee
Swamp Sparrow
Vesper Sparrow
White-crowned Sparrow
White-throated Sparrow

Yellow-breasted Chat

Yellow-breasted Chat

Cardinals, Grosbeaks, and Allies

Black-headed Grosbeak
Lazuli Bunting
Rose-breasted Grosbeak
Western Tanager

Blackbirds

Bobolink
Brewer's Blackbird
Brown-headed Cowbird
Bullock's Oriole
Red-winged Blackbird
Rusty Blackbird
Tricolored Blackbird
Western Meadowlark
Yellow-headed Blackbird

Finches, Euphonias, and Allies

American Goldfinch
Cassin's Finch
Common Redpoll
Evening Grosbeak
Gray-crowned Rosy-Finch
Hoary Redpoll
House Finch
Lesser Goldfinch
Pine Grosbeak
Pine Siskin
Purple Finch
Red Crossbill
White-winged Crossbill

Old World Sparrows

House Sparrow

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The charts that display information about "Who" (pages 5-6) and "When" (pages 9-10) were created in Affinity Designer and Affinity Publisher (<https://affinity.serif.com>). These two stand-alone products provide extensive design and layout capabilities at very reasonable costs. The charts were constructed by hand using a combination of analysis and layout tools.

Microsoft Excel is used on a monthly basis to house and manipulate the raw data that is downloaded directly from eBird. Pivot tables are remarkable tools that allow magical combination and display of complex data.

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