Alaska

Survival by Degrees: 389 Species on the Brink

Background

Birds form part of healthy ecosystems, bring joy to people, and benefit local economies throughout the United States. In 2011, birdwatching-related industries drove $41 billion in expenditures and $107 billion in total industry output nationally. There are more than 512,000 total birders in Alaska alone [1]. Additionally, birds play critical roles in pollination, insect control, forest generation, seed dispersal, carrion scavenging, and many other ecosystem services we rely on.

However, the future of birds is at risk with alarming losses of biodiversity occurring worldwide. Global extinction rates are now 100 times higher than background rates [2]. Climate change exacerbates the global biodiversity crisis, with an anticipated rate of change 20 times faster in the next century than during the past two million years.

Audubon leads the way in conducting science to understand the vulnerability and threats to birds from climate change. Our science shows that stabilizing warming at a global average of 1.5°C (2.7°F), as recommended by the IPCC (Intergovernmental Panel on Climate Change) to reduce the global risk of climate change, would also reduce vulnerability and threats for many species of birds. To save birds we must address the underlying causes of climate change (*climate change mitigation*), and protect places that birds need now and will need in the future (*climate change adaptation*). Climate change mitigation means reducing or preventing the causes of climate change, such as greenhouse gas emissions. Climate change adaptation includes efforts to alter and adapt both our natural surroundings as well as our infrastructure to better withstand the threats of climate change.

Audubon's 2019 Report, *Survival by Degrees: 389 Bird Species on the Brink* [3], is a powerful look at how vulnerable birds are to climate change across North America based on a new, updated scientific analysis that leverages big data and incorporates the unique biology of each bird to determine its vulnerability. In this research, we related bird observations for 604 species with climate and habitat conditions at these locations and used modeling algorithms to capture the unique composition of each species's suitable range. We then mapped and compared the projected current and future ranges to estimate the projected range loss and gain under multiple future climate change scenarios. These projections were then used to assess how vulnerable each species was to climate change [4,5].

Figure 1. Snowy Owl. Photo: Deborah Johnston/Audubon Photography Awards

Future Climate and Habitat in Alaska

Across the state of Alaska, without substantial climate change mitigation (i.e., a 3°C/5.4°F global warming scenario), average temperatures during the warmest month are expected to increase approximately 4.5°C (8.1°F), and average temperatures during the coldest month are expected to increase approximately 9.3°C (17°F) from 2010 to the end of the century. Average annual precipitation is expected to increase by approximately 230 mm (9.1 in). Despite the overall increase in precipitation, available moisture is expected to decrease by 10% across the state due to increases in evapotranspiration [6].

The distribution of vegetation biomes, critical for plants and animals, are also projected to change under climate change scenarios [7]. By the end of the century under a 3°C (5.4°F) global warming scenario, approximately 61% of the state of Alaska will transition to a different biome. At present, the largest biome in the state is boreal forest, covering 50% of the state. By the end of the century, boreal forest will cover approximately 34% of the state.

All of these changes in climate and vegetation will alter plant and insect communities; influence availability of food, water, and shelter for birds; and will likely cause ecological disruption as species assemblages reshuffle. Over time, a complex suite of changes in climate and vegetation will inevitably affect Alaska's bird communities.

Climate Change Vulnerability

Climate change will negatively affect many birds in the state. Here, we assess vulnerability based on the amount of a species's range that may be gained or lost with climate change. We designate species that may lose much more range across North America than they have the potential to gain as *climate vulnerable*. In Alaska, 166 out of 212 species are climate vulnerable in summer under the 3°C scenario, meaning they stand to lose more of their North American summer range than they would gain under a warming climate. Reducing emissions to 1.5°C reduces the number of vulnerable species to 133. Impacts are somewhat lessened in winter, with 36 out of 114 species vulnerable under 3°C of warming and 20 species vulnerable under 1.5°C.

Each bird was grouped by its primary habitat (see Table 2 for groupings), and these groups are not equally affected. In Alaska, the habitat groups with the most species vulnerable to the impacts of ongoing and future climate change are waterbird (59 species) and boreal forest (34 species) in summer (Figure 2). In winter, boreal forest (15 species) and coastal (7 species) groups have the most vulnerable species.

Species of interest in Alaska, like King Eider, Spectacled Eider, Willow Ptarmigan, Rock Ptarmigan, American Golden-Plover, Black-bellied Plover, Semipalmated Plover, Dunlin, Least Sandpiper, Red-necked Phalarope, and Wandering Tattler are considered highly vulnerable to climate change. For more information on vulnerability for individual species in Alaska, see Table 2.

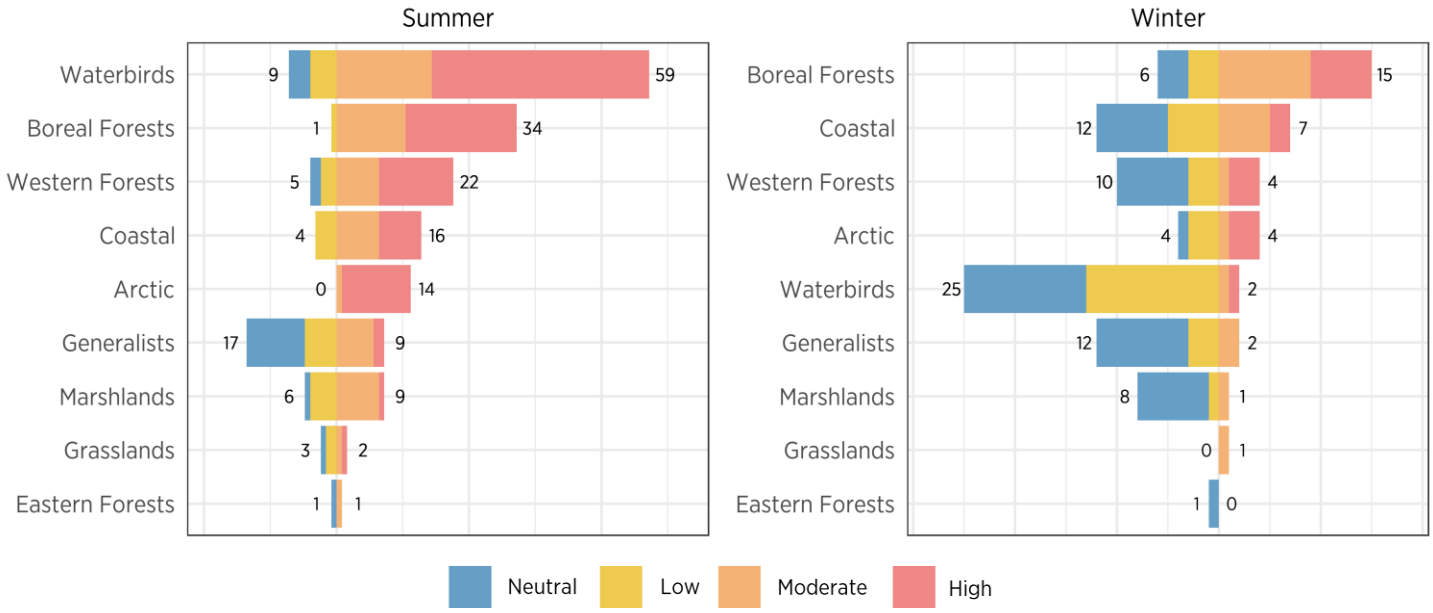

Figure 2. Number of species by their vulnerability to climate change in each habitat group under a global 3°C warming scenario. The species in each group are ones that currently live in the state, though vulnerability is assessed across the species's full North American range to better account for range-wide changes. Red and orange indicate number of vulnerable (high and moderate) species, and yellow and blue indicate non-vulnerable (low and neutral) species.

Conclusions and Caveats

Birds are early responders to climate change and can be important indicators of large-scale ongoing and future ecological change. We found that 79% of Alaska's 217 bird species are vulnerable to climate change across seasons. A rapidly changing climate could lead to population declines and local extinctions if species are not able to adapt. In addition, the reshuffling of bird communities at a continental scale will bring together species that previously lived in isolation, leading to novel, unpredictable interactions. Disruptions in food and nesting resources further compound vulnerabilities to climate change.

Although we project range gains offsetting loss for some species, especially in winter, it is unknown whether birds will establish populations in these new locations because of other factors not assessed here. On top of this, the added stressors of extreme weather events and other climate change-related threats will make establishment and persistence of populations difficult in the coming decades.

While these studies did not assess the effects of climate change on people, we know that the fate of humans and birds are deeply connected. Climate change is currently and will continue to cause harm to people too, who face threats like extreme weather, loss of coastal areas and changing economic patterns, to name a few. Climate change will cause disproportionate harm to vulnerable communities, including children, the elderly, the sick, and the poor, who may have fewer resources available to move or otherwise protect themselves from these threats. If we drastically reduce carbon emissions, we help people and birds alike.

This is the most comprehensive assessment of climate change vulnerability of birds in North America to date, but even this assessment may reasonably be considered conservative because the pace of change is exceeding the scenarios considered in this study. Our work concludes that climate change will have multiple, compounding effects on birds and will likely amplify biodiversity loss, unless actions are taken to lessen its effects.

Call to Action

We know what to do.

The scientific consensus is clear. We must reduce greenhouse gas emissions at an urgent speed and on a wide scale from every sector of the economy to achieve a more favorable future for birds and people. There is no single perfect solution, but we can make a series of changes that lead to large-scale, systemic adjustments to achieve the required reductions.

Addressing the underlying causes of climate change.

Audubon is pursuing policies that together can drive down emissions at the scale and speed we need. For instance, we can invest in 100% clean energy, energy efficiency, and clean transportation policies that will dramatically reduce carbon emissions from the U.S. and world economies. We can adapt, improve, and innovate. We can power our cars, homes, cities, factories, farms, communities, and economy with clean energy-without contributing to climate change. We are working to implement policies and conservation practices that offset what we cannot eliminate, such as planting forests and testing new technologies to capture (i.e., sequester) carbon through industrial processes and permanently store it underground. We can do all of this in ways that spur innovation, create good jobs, promote homegrown industries, and build our economy for a smarter future.

Protecting the places birds need.

We can also pursue policies and conservation practices that help us avoid some of the worst effects of climate change by building more resilient infrastructure—meaning our cities, roads, and other structures—or even ranches, parks, floodplains, forests, and wetlands that can serve as good wildlife habitat and simultaneously protect our communities from extreme weather.

Audubon has identified the best opportunities to increase the resilience of coastal wetlands in key places that can serve as the first line of defense against the threat of sea level rise. We work to ensure key landscapes that are critical for birds have clean and reliable sources of water, now and in the future, and we advocate for conservation-minded management of working and urban landscapes that can help birds adapt to the changing climate.

We still have time.

We can avert and limit dangerous warming and its worst effects if we act quickly. Science tells us that in order to limit warming to a rise of 1.5°C (2.7°F), we must reduce greenhouse gas emissions 45% below 2010 levels by 2030 and reach net-zero carbon emissions by 2050.

We must act now.

We are on a dangerous path, but we have the power to chart a better one. Still, change will come only if we demand action from the public officials who represent us and the businesses we support.

We ask you to join us.

Be part of the solution. We can do this, together.

How You Can Help in Alaska

We still have time.

We can focus on state-based solutions to address climate mitigation. Using the Anchorage Climate Plan, and supporting climate plans in other cities and communities across the state will give us the collective power to implement a statewide climate plan. We also need to hold our decision makers accountable for funding and resources to address real climate change catastrophes. Right now, communities are relocating in Alaska because of climate change, yet funding is limited, and our legislators continue to support actions that exacerbate climate change impacts. If we hold them accountable for their actions, they will address the issues that Alaskans care about now and in the future.

We can avert and limit dangerous warming and its worst effects if we act quickly.

Science tells us that in order to limit warming to a rise of 1.5°C (2.7°F), we must reduce greenhouse gas emissions 45% below 2010 levels by 2030 and reach net-zero carbon emissions by 2050. This will require a combination of policy and action. We can reduce emissions in our communities, but we also need to protect the intact landscapes that will be part of our climate solutions framework. Alaska is 60% public lands, and U.S. public lands currently emit 25% of our annual carbon emissions. By protecting the Arctic Wildlife Refuge, we can reduce our carbon emissions by 12%. By protecting roadless areas on the Tongass National Forest, we are protecting the forest's role in sequestering 10% of the total carbon sequestered on all our national forests. This means Alaska has the ability to reduce our nation's carbon emissions by almost 25%. Big Alaska landscapes can be large components of global climate solutions, but only if we start looking at our public lands as key components of mitigating climate change and creating resilient communities for our future.

More Information

This project was conducted by the National Audubon Society. For more information, including details on the methods, please see the project website (climate.audubon.org) and the scientific publications [5,8].

References

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Species Projections

Table 1. Climate suitability projections in summer and winter under the 3°C warming scenario for birds in Alaska. Each bird is associated with the *Habitat Group* representing its primary habitat (see classification key below). *Range-wide Vulnerability* is the vulnerability of each species, across its full North American range under 3°C of global warming, based on long-term climate and vegetation change. High and moderately vulnerable species are considered vulnerable to climate change, whereas low and neutral species are considered not vulnerable. In *State Trends*, we show the top two trends in climate and habitat suitability for select birds in Alaska, with colors reflecting the trend according to the legend below and percentages reflecting the percent of the state's area in which each trend will occur. The total percentage reflects the area of the state that the species currently occupies and is projected to occupy in the future. Potential colonization indicates that climate and habitat are projected to become suitable for the species, whereas potential extirpation indicates that climate and habitat are suitable today but projected to become unsuitable. *State Threats* shows the additional climate-related threats each species might face, indicated by icons as in Table 1. Threats shown here were assessed within each state for species under either 1.5°C or 3°C warming (i.e., species that will be completely extirpated from the state do not have threats shown). Omitted species are either not present in the state during that season or not modeled due to data deficiency. These lists may have been further reduced by local experts. For a full list of species modeled in Alaska, see the project website (climate.audubon.org).

Habitat classifications:

F-B = Boreal Forests
F-E = Eastern Forests
F-W = Western Forests
F-S = Subtropical Forests
A = Arctic
D = Aridlands
G = Grasslands
M = Marshlands
C = Coastal
W = Waterbirds
Gen = Generalists

Trend classifications:

Potential extirpation
Worsening
Stable
Improving
Potential colonization

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Emperor Goose	W	Summer	High	1%
Snow Goose	W	Summer	High	<1% 1%
Greater White-fronted Goose	W	Summer	Moderate	33% 14%
Brant	W	Summer	High	5% 1%
	W	Winter	Moderate	14%
Cackling Goose	M	Summer	Low	11% 10%
	M	Winter	Moderate	3%
Canada Goose	W	Summer	Moderate	39% 6%
	W	Winter	Neutral	37%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Trumpeter Swan	W	Summer	Moderate	18% 19%
	W	Winter	Low	2% 20%
Tundra Swan	W	Summer	High	13%
Blue-winged Teal	M	Summer	Low	10% 22%
Cinnamon Teal	M	Summer	Moderate	2%
Northern Shoveler	M	Summer	Low	14% 11%
	M	Winter	Neutral	4%
Gadwall	M	Summer	Moderate	7% 16%
	M	Winter	Neutral	2% 10%
Eurasian Wigeon	M	Winter	Moderate	2% 9%
American Wigeon	M	Summer	Moderate	28% 13%
	M	Winter	Neutral	1% 12%
Mallard	W	Summer	Low	27% 22%
	W	Winter	Neutral	12% 54%
American Black Duck	W	Winter	Low	4%
Northern Pintail	M	Summer	Moderate	14% 24%
	M	Winter	Neutral	1% 11%
Green-winged Teal	M	Summer	Moderate	25% 23%
	M	Winter	Neutral	1% 10%
Canvasback	M	Summer	Low	4% 4%
	M	Winter	Neutral	6%
Redhead	M	Summer	Neutral	7% 6%
	M	Winter	Low	7%
Ring-necked Duck	W	Summer	Moderate	15% 28%
	W	Winter	Neutral	<1% 8%
Greater Scaup	W	Summer	High	36% 4%
	W	Winter	Neutral	5% 21%
Lesser Scaup	W	Summer	High	40% 8%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
	W	Winter	Neutral	<1% 17%
Steller's Eider	C	Summer	High	2%
	C	Winter	Moderate	2% <1%
Spectacled Eider	C	Summer	High	5% 1%
King Eider	W	Summer	High	8%
	W	Winter	Low	5% 6%
Common Eider	C	Summer	Moderate	3% 2%
	C	Winter	Low	2% 2%
Harlequin Duck	W	Summer	Moderate	21% 12%
	W	Winter	Low	6% 7%
Surf Scoter	W	Summer	High	33% 7%
	C	Winter	Neutral	7% 4%
White-winged Scoter	W	Summer	High	59% 5%
	W	Winter	Neutral	2% 7%
Black Scoter	C	Summer	Moderate	15% 3%
	C	Winter	Neutral	7% 3%
Long-tailed Duck	W	Summer	Moderate	43% 10%
	W	Winter	Low	7% 19%
Bufflehead	W	Summer	High	27% 8%
	W	Winter	Low	3% 23%
Common Goldeneye	W	Summer	High	33% 33%
	W	Winter	Neutral	5% 26%
Barrow's Goldeneye	W	Summer	High	22% 5%
	W	Winter	High	11% 7%
Hooded Merganser	W	Summer	Low	6% 55%
	W	Winter	Neutral	<1% 16%
Common Merganser	W	Summer	Moderate	45% 19%
	W	Winter	Low	6% 25%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Red-breasted Merganser	W	Summer	Moderate	38% 17%
	W	Winter	Low	5% 25%
Ruddy Duck	M	Winter	Neutral	3%
Ruffed Grouse	F-B	Summer	Moderate	24% 42%
	F-B	Winter	Moderate	30% 32%
Spruce Grouse	F-B	Summer	High	31% 13%
	F-B	Winter	High	27% 23%
Willow Ptarmigan	A	Summer	Moderate	44% 29%
	A	Winter	High	63% 18%
Rock Ptarmigan	A	Summer	High	42% 5%
	A	Winter	High	53% 13%
Dusky Grouse	F-W	Summer	High	1%
	F-W	Winter	High	2%
Sharp-tailed Grouse	G	Summer	Low	7% 28%
	G	Winter	Moderate	9% 28%
Wild Turkey	Gen	Summer	Neutral	7%
	Gen	Winter	Neutral	13%
Pied-billed Grebe	M	Summer	Neutral	3%
	M	Winter	Neutral	4%
Horned Grebe	M	Summer	High	11% 1%
	M	Winter	Neutral	3% 8%
Red-necked Grebe	M	Summer	Moderate	26% 11%
	M	Winter	Neutral	6% 7%
Eared Grebe	M	Winter	Neutral	2%
Western Grebe	M	Summer	Low	4%
	M	Winter	Low	2% 8%
Band-tailed Pigeon	F-W	Summer	Moderate	2%
Mourning Dove	Gen	Winter	Neutral	1%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Black-billed Cuckoo	F-E	Summer	Low	21%
Common Nighthawk	Gen	Summer	Neutral	40%
Black Swift	F-W	Summer	Moderate	9%
Vaux's Swift	F-W	Summer	High	<1% 5%
Anna's Hummingbird	Gen	Winter	Moderate	1%
Rufous Hummingbird	F-W	Summer	High	4% 2%
Virginia Rail	M	Winter	Low	3%
Sora	M	Summer	Moderate	<1% 23%
American Coot	M	Winter	Neutral	<1% 7%
Sandhill Crane	M	Summer	Moderate	22% 10%
Whooping Crane	W	Summer	High	4%
Black Oystercatcher	C	Summer	Low	3% 3%
	C	Winter	Neutral	2% 4%
Black-bellied Plover	W	Summer	High	16% <1%
American Golden-Plover	W	Summer	High	24% <1%
Pacific Golden-Plover	W	Summer	High	13% 3%
Semipalmated Plover	W	Summer	High	64% 6%
Killdeer	W	Summer	Neutral	1% 22%
	W	Winter	Neutral	15%
Upland Sandpiper	G	Summer	Neutral	6% 14%
Whimbrel	W	Summer	High	16% <1%
Hudsonian Godwit	W	Summer	High	3%
Marbled Godwit	M	Winter	Neutral	1%
Ruddy Turnstone	W	Summer	High	6% <1%
	W	Winter	Neutral	2%
Black Turnstone	W	Summer	Low	4% 6%
	C	Winter	Neutral	5% 3%
Surfbird	W	Summer	High	13%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
	W	Winter	Low	9% 3%
Stilt Sandpiper	W	Summer	High	2% <1%
Sanderling	W	Summer	High	<1%
Dunlin	W	Summer	High	18% 3%
	W	Winter	Low	4% 4%
Rock Sandpiper	W	Summer	High	7% <1%
	C	Winter	High	4% <1%
Baird's Sandpiper	W	Summer	High	3% <1%
Least Sandpiper	W	Summer	Moderate	57% 14%
White-rumped Sandpiper	W	Summer	High	3% 1%
Buff-breasted Sandpiper	W	Summer	High	6%
Pectoral Sandpiper	W	Summer	High	12%
Semipalmated Sandpiper	W	Summer	High	7% <1%
Western Sandpiper	W	Summer	High	6%
Short-billed Dowitcher	W	Summer	High	4% 5%
Long-billed Dowitcher	W	Summer	High	10% <1%
Wilson's Snipe	M	Summer	Moderate	30% 20%
	M	Winter	Neutral	6%
Red-necked Phalarope	W	Summer	High	35% 6%
Red Phalarope	W	Summer	High	8% <1%
Spotted Sandpiper	W	Summer	Moderate	20% 29%
Solitary Sandpiper	W	Summer	Moderate	20% 13%
Wandering Tattler	W	Summer	High	39% 5%
Greater Yellowlegs	W	Summer	High	29% 11%
Willet	W	Summer	Neutral	4%
Lesser Yellowlegs	W	Summer	High	12% 20%
Pomarine Jaeger	W	Summer	Moderate	6% 4%
Parasitic Jaeger	C	Summer	High	23% 1%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Long-tailed Jaeger	W	Summer	High	39% 3%
Common Murre	C	Summer	Low	4% 7%
	C	Winter	Neutral	10% 5%
Thick-billed Murre	C	Summer	High	2% <1%
	C	Winter	Moderate	4% 5%
Black Guillemot	C	Summer	Moderate	<1%
Pigeon Guillemot	C	Summer	Moderate	5% 7%
	C	Winter	Moderate	7% 5%
Marbled Murrelet	C	Summer	Low	7% 2%
	C	Winter	Moderate	3% 5%
Kittlitz's Murrelet	C	Summer	High	13% 2%
Ancient Murrelet	C	Summer	High	3% 4%
Cassin's Auklet	C	Summer	Moderate	5% 2%
	C	Winter	Neutral	5%
Rhinoceros Auklet	C	Winter	Low	<1% 4%
Black-legged Kittiwake	C	Summer	High	2%
	C	Winter	Neutral	9% 9%
Sabine's Gull	C	Summer	Moderate	4% 8%
Bonaparte's Gull	W	Summer	High	32% 12%
Little Gull	C	Winter	Low	2%
Mew Gull	W	Summer	Moderate	49% 13%
	C	Winter	Neutral	11% 16%
Ring-billed Gull	W	Winter	Neutral	16%
Western Gull	C	Winter	Low	5%
California Gull	W	Summer	Moderate	1% 7%
Herring Gull	W	Summer	Low	11% 28%
	W	Winter	Neutral	3% 47%
Iceland Gull	C	Winter	Low	1% 37%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Glaucous-winged Gull	C	Summer	Moderate	18% 20%
	C	Winter	Low	4% 4%
Glaucous Gull	W	Summer	Moderate	4% 11%
	W	Winter	Low	15% 22%
Caspian Tern	W	Summer	Low	1% 13%
Black Tern	M	Summer	Low	4%
Common Tern	W	Summer	Low	19%
Arctic Tern	W	Summer	Moderate	52% 10%
Forster's Tern	M	Summer	Neutral	11%
Red-throated Loon	W	Summer	Moderate	34% 7%
	W	Winter	Low	1% 16%
Pacific Loon	W	Summer	High	30% 1%
	W	Winter	Low	2% 11%
Common Loon	W	Summer	Moderate	56% 25%
	W	Winter	Low	4% 11%
Yellow-billed Loon	W	Summer	High	10% <1%
	W	Winter	Moderate	1% 2%
Northern Fulmar	C	Summer	Moderate	4% 12%
	C	Winter	Low	3% 10%
Brandt's Cormorant	C	Winter	Low	5%
Red-faced Cormorant	C	Summer	High	2%
	C	Winter	High	2% <1%
Pelagic Cormorant	C	Summer	Low	4% 6%
	C	Winter	Moderate	2% 5%
Double-crested Cormorant	W	Summer	Neutral	1% 32%
	W	Winter	Neutral	<1% 9%
Least Bittern	M	Summer	Neutral	8%
Great Blue Heron	W	Summer	Neutral	11% 46%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
	W	Winter	Neutral	1% 9%
Snowy Egret	M	Winter	Neutral	1%
Green Heron	M	Summer	Neutral	3%
	M	Winter	Neutral	1%
Black-crowned Night-Heron	M	Winter	Neutral	1%
Turkey Vulture	Gen	Summer	Neutral	2%
Osprey	W	Summer	Neutral	4% 32%
White-tailed Kite	D	Winter	Neutral	1%
Golden Eagle	Gen	Summer	Moderate	24% 11%
	Gen	Winter	Moderate	2% 5%
Northern Harrier	M	Summer	Low	7% 27%
	M	Winter	Neutral	10%
Sharp-shinned Hawk	F-W	Summer	Moderate	38% 38%
	F-W	Winter	Neutral	1% 30%
Cooper's Hawk	Gen	Summer	Neutral	38%
	Gen	Winter	Low	3%
Northern Goshawk	F-B	Summer	High	30% 20%
	F-B	Winter	Low	43% 28%
Bald Eagle	Gen	Summer	Low	43% 35%
	Gen	Winter	Neutral	20% 52%
Red-shouldered Hawk	F-E	Summer	Neutral	9%
Broad-winged Hawk	F-E	Summer	Low	21%
Swainson's Hawk	G	Summer	Neutral	1%
Red-tailed Hawk	Gen	Summer	Neutral	46% 38%
	Gen	Winter	Neutral	16%
Rough-legged Hawk	A	Summer	High	33% 1%
	A	Winter	Moderate	9%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Barn Owl	Gen	Summer	Neutral	13%
	Gen	Winter	Neutral	18%
Western Screech-Owl	F-W	Summer	Neutral	4% 4%
	F-W	Winter	Neutral	2% 5%
Great Horned Owl	Gen	Summer	Neutral	18% 37%
	Gen	Winter	Neutral	26% 44%
Snowy Owl	A	Summer	High	5%
	A	Winter	Low	66%
Northern Hawk Owl	F-B	Summer	Moderate	23% 31%
	F-B	Winter	Moderate	21% 24%
Northern Pygmy-Owl	F-W	Summer	High	3% 5%
	F-W	Winter	High	4% 7%
Barred Owl	F-E	Summer	Neutral	16% 41%
	F-E	Winter	Neutral	14% 37%
Great Gray Owl	F-B	Summer	High	20% 20%
	F-B	Winter	Moderate	27% 34%
Long-eared Owl	F-W	Summer	Low	22%
	F-W	Winter	Low	6%
Short-eared Owl	G	Summer	Moderate	32% 25%
Boreal Owl	F-B	Summer	High	27% 24%
	F-B	Winter	High	27% 21%
Northern Saw-whet Owl	F-B	Summer	Moderate	9% 45%
	F-B	Winter	Low	21% 47%
Belted Kingfisher	Gen	Summer	Neutral	20% 46%
	Gen	Winter	Neutral	3% 12%
Yellow-bellied Sapsucker	F-E	Summer	High	22%
Red-naped Sapsucker	F-W	Summer	High	4%
Red-breasted Sapsucker	F-W	Summer	High	3%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
	F-W	Winter	Low	1% 5%
American Three-toed Woodpecker	F-B	Summer	High	31% 20%
	F-B	Winter	High	40% 18%
Black-backed Woodpecker	F-B	Summer	High	13% 33%
	F-B	Winter	Moderate	3% 34%
Downy Woodpecker	Gen	Summer	Neutral	23% 46%
	Gen	Winter	Neutral	18% 53%
Hairy Woodpecker	Gen	Summer	Low	23% 48%
	Gen	Winter	Low	13% 56%
Pileated Woodpecker	F-E	Summer	Neutral	49%
	F-E	Winter	Neutral	29%
Northern Flicker	Gen	Summer	Moderate	51% 33%
	Gen	Winter	Neutral	10% 43%
American Kestrel	Gen	Summer	Neutral	4% 51%
Merlin	F-E	Summer	Moderate	31% 38%
	F-E	Winter	Neutral	60%
Gyrfalcon	A	Summer	High	33% 2%
	A	Winter	Low	39% 30%
Peregrine Falcon	Gen	Summer	Neutral	57% 20%
	Gen	Winter	Neutral	3% 35%
Olive-sided Flycatcher	F-B	Summer	High	22% 21%
Western Wood-Pewee	F-W	Summer	High	3% 6%
Yellow-bellied Flycatcher	F-B	Summer	High	1% 16%
Alder Flycatcher	F-B	Summer	Moderate	40% 29%
Willow Flycatcher	F-W	Summer	Moderate	7%
Least Flycatcher	F-B	Summer	Moderate	1% 33%
Hammond's Flycatcher	F-W	Summer	High	18% 6%
Pacific-slope Flycatcher	F-W	Summer	Low	5% 6%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Say's Phoebe	Gen	Summer	Low	5% <1%
Eastern Kingbird	G	Summer	Moderate	1%
Northern Shrike	F-B	Summer	High	38% 3%
	F-B	Winter	Moderate	7% 47%
Hutton's Vireo	F-W	Summer	Moderate	2%
	F-W	Winter	Moderate	3%
Cassin's Vireo	F-W	Summer	Low	2% 3%
Blue-headed Vireo	F-E	Summer	High	19%
Philadelphia Vireo	F-B	Summer	High	14%
Warbling Vireo	Gen	Summer	Neutral	15% 43%
Red-eyed Vireo	F-E	Summer	Low	8%
Canada Jay	F-B	Summer	High	34% 21%
	F-B	Winter	High	29% 22%
Steller's Jay	F-W	Summer	Moderate	6% 5%
	F-W	Winter	Moderate	8% 5%
Blue Jay	F-E	Summer	Neutral	12%
	F-E	Winter	Neutral	1%
Black-billed Magpie	Gen	Summer	High	5% 14%
	Gen	Winter	Moderate	14% 17%
Clark's Nutcracker	F-W	Summer	High	3%
	F-W	Winter	High	2%
American Crow	Gen	Summer	Low	5%
	Gen	Winter	Neutral	63%
Northwestern Crow	Gen	Summer	Moderate	3% 7%
	Gen	Winter	Low	5% 6%
Common Raven	Gen	Summer	Low	44% 27%
	Gen	Winter	Low	46% 40%
Horned Lark	G	Summer	Low	9% 4%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
	G	Winter	Low	10%
Northern Rough-winged Swallow	Gen	Summer	Neutral	9%
Purple Martin	Gen	Summer	Neutral	9%
Tree Swallow	Gen	Summer	Moderate	18% 43%
Violet-green Swallow	F-W	Summer	Moderate	14% 9%
Bank Swallow	Gen	Summer	Neutral	34% 31%
Barn Swallow	Gen	Summer	Neutral	3% 27%
Cliff Swallow	Gen	Summer	Neutral	19% 38%
Black-capped Chickadee	F-B	Summer	Low	41% 44%
	F-B	Winter	Low	20% 48%
Chestnut-backed Chickadee	F-W	Summer	Low	5% 8%
	F-W	Winter	Neutral	4% 4%
Boreal Chickadee	F-B	Summer	High	31% 18%
	F-B	Winter	High	28% 21%
Bushtit	F-W	Summer	High	2%
	F-W	Winter	Moderate	2%
Red-breasted Nuthatch	F-B	Summer	Moderate	13% 45%
	F-B	Winter	Neutral	33% 46%
White-breasted Nuthatch	F-E	Summer	Low	51%
	F-E	Winter	Neutral	58%
Brown Creeper	F-W	Summer	Moderate	7% 47%
	F-W	Winter	Neutral	24% 57%
Pacific Wren	F-W	Summer	Neutral	7% 8%
	F-W	Winter	Low	1% 7%
Winter Wren	F-E	Summer	High	24%
Marsh Wren	M	Winter	Low	2%
American Dipper	F-W	Summer	Moderate	16% 20%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
	F-W	Winter	High	7% 13%
Golden-crowned Kinglet	F-B	Summer	Moderate	17% 32%
	F-B	Winter	Neutral	4% 15%
Ruby-crowned Kinglet	F-W	Summer	High	24% 25%
	F-W	Winter	Neutral	5%
Arctic Warbler	A	Summer	High	15% 4%
Mountain Bluebird	F-W	Summer	High	1%
Townsend's Solitaire	F-W	Summer	High	3% 2%
	F-W	Winter	High	<1%
Varied Thrush	F-W	Summer	High	21% 9%
	F-W	Winter	Low	5% 11%
Veery	F-E	Summer	Moderate	22%
Gray-cheeked Thrush	F-B	Summer	High	61% 8%
Swainson's Thrush	F-B	Summer	High	25% 26%
Hermit Thrush	F-W	Summer	High	17% 16%
	F-W	Winter	Low	1%
American Robin	Gen	Summer	Moderate	42% 35%
	Gen	Winter	Neutral	2% 47%
American Pipit	A	Summer	High	33% 8%
Sprague's Pipit	G	Summer	High	2%
Bohemian Waxwing	F-B	Summer	High	37% 11%
	F-B	Winter	High	8% 20%
Cedar Waxwing	Gen	Summer	Low	33% 42%
Olive Warbler	F-S	Winter	High	1%
Evening Grosbeak	F-B	Summer	High	33%
	F-B	Winter	Moderate	45%
Pine Grosbeak	F-B	Summer	High	44% 10%
	F-B	Winter	Moderate	38% 23%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Gray-crowned Rosy-Finch	A	Summer	High	18% 5%
	A	Winter	High	8% 2%
House Finch	Gen	Summer	Low	17%
	Gen	Winter	Low	17%
Purple Finch	F-B	Summer	Moderate	42%
	F-B	Winter	Low	18%
Common Redpoll	A	Summer	High	74% 9%
	A	Winter	Low	29% 35%
Hoary Redpoll	A	Summer	High	23% <1%
	A	Winter	Moderate	11% 38%
Red Crossbill	F-B	Summer	High	8% 31%
	F-B	Winter	Moderate	27% 34%
White-winged Crossbill	F-B	Summer	High	33% 16%
	F-B	Winter	Moderate	27% 37%
Pine Siskin	F-W	Summer	Moderate	23% 28%
	F-W	Winter	Neutral	31% 43%
American Goldfinch	Gen	Summer	Moderate	32%
	Gen	Winter	Neutral	37%
Lapland Longspur	A	Summer	High	31% 1%
	A	Winter	Neutral	22%
Smith's Longspur	A	Summer	High	6%
Snow Bunting	A	Summer	High	26% 2%
	A	Winter	Low	38% 43%
Chipping Sparrow	Gen	Summer	Moderate	4% 41%
American Tree Sparrow	A	Summer	High	45% 7%
	A	Winter	Neutral	1% 42%
Fox Sparrow	F-B	Summer	High	50% 25%
	F-B	Winter	Moderate	2% 10%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Dark-eyed Junco	F-W	Summer	High	39% 21%
	F-W	Winter	Neutral	10% 50%
White-crowned Sparrow	Gen	Summer	High	58% 12%
	Gen	Winter	Neutral	2%
Golden-crowned Sparrow	F-B	Summer	High	23% 4%
White-throated Sparrow	F-B	Summer	High	19%
	F-B	Winter	Neutral	14%
Vesper Sparrow	G	Summer	Moderate	14%
LeConte's Sparrow	G	Summer	High	12%
Savannah Sparrow	G	Summer	High	15% 32%
Song Sparrow	Gen	Summer	Moderate	30% 42%
	Gen	Winter	Neutral	3% 48%
Lincoln's Sparrow	F-B	Summer	High	38% 20%
	F-B	Winter	Neutral	<1% 6%
Swamp Sparrow	M	Summer	Moderate	15%
Spotted Towhee	F-W	Summer	Moderate	5%
	F-W	Winter	Low	7%
Bobolink	G	Summer	High	4%
Red-winged Blackbird	Gen	Summer	Neutral	6% 40%
	Gen	Winter	Neutral	15%
Brown-headed Cowbird	Gen	Summer	Neutral	39%
Rusty Blackbird	F-B	Summer	High	43% 15%
Ovenbird	F-E	Summer	Moderate	15%
Northern Waterthrush	F-B	Summer	Moderate	32% 17%
Golden-winged Warbler	F-E	Summer	High	6%
Black-and-white Warbler	F-E	Summer	Moderate	27%
Tennessee Warbler	F-B	Summer	Moderate	1% 32%
Orange-crowned Warbler	F-W	Summer	High	38% 18%

Species	Habitat Group	Season	Range-wide Vulnerability	State Trends
Nashville Warbler	F-E	Summer	Moderate	4%
Connecticut Warbler	F-B	Summer	High	2%
MacGillivray's Warbler	F-W	Summer	Moderate	1% 2%
Mourning Warbler	F-B	Summer	High	19%
Common Yellowthroat	Gen	Summer	Low	22% 36%
American Redstart	F-B	Summer	Moderate	12% 47%
Cape May Warbler	F-B	Summer	High	3%
Magnolia Warbler	F-B	Summer	High	21%
Bay-breasted Warbler	F-B	Summer	High	2%
Blackburnian Warbler	F-B	Summer	High	3%
Yellow Warbler	F-B	Summer	Moderate	37% 33%
Blackpoll Warbler	F-B	Summer	Moderate	23% 55%
Palm Warbler	F-B	Summer	High	19%
	F-B	Winter	Low	1%
Yellow-rumped Warbler	F-B	Summer	Moderate	41% 24%
	F-B	Winter	Neutral	4%
Townsend's Warbler	F-W	Summer	High	5% 4%
	F-W	Winter	Moderate	1%
Black-throated Green Warbler	F-E	Summer	High	1%
Canada Warbler	F-B	Summer	High	27%
Wilson's Warbler	F-W	Summer	High	30% 29%
	F-W	Winter	Low	1%
Western Tanager	F-W	Summer	Moderate	<1% 5%
	F-W	Winter	Low	2%
Rose-breasted Grosbeak	F-E	Summer	Moderate	16%
Lazuli Bunting	F-W	Summer	Neutral	9%