

# Gray Jay

*Perisoreus canadensis*

Class: Aves

Order: Passeriformes

## Conservation Status

NatureServe:

Agency:

G Rank: G5

USFWS:

IUCN: Least Concern

Audubon AK:

S Rank: S5

BLM:

ADF&G: Species of Greatest Conservation Need

Final Rank		
Conservation category: <b>II. Red</b>		
II = high status and either high biological vulnerability or high action need		
<u>Category</u>	<u>Range</u>	<u>Score</u>
Status:	-20 to 20	6
Biological:	-50 to 50	-38
Action:	-40 to 40	16
<b>Higher numerical scores denote greater concern</b>		

**Status** - variables measure the trend in a taxon's population status or distribution. Higher status scores denote taxa with known declining trends. Status scores range from -20 (increasing) to 20 (decreasing).

	Score
<i>Population Trend (-10 to 10)</i>	6
Data are inadequate for detecting a short-term (2003-2015) trend (Handel and Sauer 2017); however, scientists in Alaska believe that gray jay populations may be declining (McIntyre et al. 2017). Analysis of long-term trends (1993-2015) from Breeding Bird Surveys suggest a stable trend in interior Alaska (Handel and Sauer 2017).	
<i>Distribution Trend (-10 to 10)</i>	0
Unknown.	
<b>Status Total:</b>	<b>6</b>

**Biological** - variables measure aspects of a taxon's distribution, abundance and life history. Higher biological scores suggest greater vulnerability to extirpation. Biological scores range from -50 (least vulnerable) to 50 (most vulnerable).

	Score
<i>Population Size (-10 to 10)</i>	-10
Uncertain, but >25,000. Partners in Flight estimates the Alaskan population at 4,600,000 (95% CI: 3.2 million - 6.2 million; PIF 2019).	
<i>Range Size (-10 to 10)</i>	-10
>400,00 sq. km. Found throughout interior and southcentral Alaska, from south of the Brooks Range to the Kenai Peninsula and the Wrangell Mountains, east to the Canadian border and west to the treeline (Kessel 1989; ACCS 2017a). Rare in southeast Alaska (Armstrong 2008).	
<i>Population Concentration (-10 to 10)</i>	-10
Does not concentrate.	
<i>Reproductive Potential</i>	
<u>Age of First Reproduction (-5 to 5)</u>	-5
Can breed in their first year, but most do not breed until their second year (Strickland and Ouellet 2018).	
<u>Number of Young (-5 to 5)</u>	1

Females lay a single clutch per year, though reneating is possible if the first clutch fails (Strickland and Ouellet 2018). Clutch size in Alaska is usually 3-4 eggs (Kessel 1989).

### *Ecological Specialization*

#### Dietary (-5 to 5)

-5

Generalist omnivore and scavenger whose diet changes with seasonal availability (Kessel 1989). Feeds on arthropods, berries, seeds, bird eggs, and human food (Kessel 1989; Sieving and Willson 1998; Matsuoka et al. 2001); small mammals such as voles and shrews also seem to be an important part of their diet (Strickland and Ouellet 2018).

#### Habitat (-5 to 5)

1

In Alaska, gray jays are most abundant in coniferous and mixedwood forests, especially spruce forests (Isleib and Kessel 1973; Spindler and Kessel 1980; Cotters and Andres 2000a). To a lesser extent, they are also found in treed bogs, deciduous forests, and tall shrubs (Isleib and Kessel 1973; Spindler and Kessel 1980; Kessel 1989). On the Kenai Peninsula, Lance and Howell (2000) observed similar densities of gray jays in logged forest stands and in stands that were lightly or heavily infested by spruce bark beetle. In western Alaska, nests exclusively in spruce trees (Kessel 1989), though nests in hemlock, fir, and willows have been reported elsewhere (Strickland and Ouellet 2018). Nests are constructed on branches of coniferous trees, usually close to the tree trunk (Strickland and Ouellet 2018). Quinlan (1978) suggested that gray jays require mature forests (>20 years) for nesting, though additional research is needed on nesting requirements.

**Biological Total:** -38

**Action** - variables measure current state of knowledge or extent of conservation efforts directed toward a given taxon. Higher action scores denote greater information needs due of lack of knowledge or conservation action. Action scores range from -40 (lower needs) to 40 (greater needs).

**Score**

#### *Management Plans and Regulations (-10 to 10)*

2

Protected under the Migratory Bird Treaty Act (MBTA 1918).

#### *Knowledge of Distribution and Habitat (-10 to 10)*

2

Distribution is well understood in Alaska. Broad habitat associations in interior, western, and southcoastal Alaska have been described during multi-species bird surveys (Isleib and Kessel 1973; Quinlan 1978; Spindler and Kessel 1980; Kessel 1989; Cotters and Andres 2000a). However, because Gray Jays nest earlier than most other species, specific habitat requirement during nesting are unknown, though anecdotal observations suggest a certain degree of specialization (Quinlan 1978; Kessel 1989).

#### *Knowledge of Population Trends (-10 to 10)*

2

Monitored as part of the Breeding Bird Survey, though data are inadequate to detect short-term trends (Handel and Sauer 2017). Also monitored as part of localized surveys in national parks (e.g. Handel et al. 2009; McIntyre et al. 2017).

#### *Knowledge of Factors Limiting Populations (-10 to 10)*

10

Little is known about the factors that affect populations in Alaska. Neither spruce beetle infestations nor logging seem to affect occurrence or density, perhaps because gray jays benefit from increasing edge habitat (Lance and Howell 2000; Collins et al. 2001; Matsuoka et al. 2001; Thompson et al. 2008). However, Quinlan (1978) found that this species was negatively affected by fire because it required mature forests for nesting. In some areas, densities may be limited by territorial behavior (Strickland and Ouellet 2018).

At the southern edge of its range, warmer autumn temperatures were correlated with long-term population declines, delayed breeding, and lower reproductive rates (Waite and Strickland 2006). Because gray jays store perishable food items, Waite and Strickland (2006) proposed that warmer autumn temperatures decrease winter food available by degrading food quality ("hoard-rot hypothesis"). This effect is concerning because gray jays are food-limited in the winter (Waite 1990; Waite 1991a; Derbyshire et al. 2015). In addition, warm temperatures during incubation -- which are more likely to be encountered if females breed later in the season -- have been linked to smaller clutch sizes (Whelan et al. 2016; 2017). Whether gray jays in Alaska will be similarly negatively affected by climate change is unknown, as models predict a future increase in the amount of habitat

suitable (Marcot et al. 2015). In 2016, Denali National Park began the Gray Jay Ecology project to better understand habitat requirements and the effects of climate change on measures of fitness (McIntyre et al. 2017).

Action Total: 16

**Supplemental Information** - variables do not receive numerical scores. Instead, they that are used to sort taxa to answer specific biological or management questions.

<b>Harvest:</b>	None or Prohibited
<b>Seasonal Occurrence:</b>	Year-round
<b>Taxonomic Significance:</b>	Monotypic species
<b>% Global Range in Alaska:</b>	>10%
<b>% Global Population in Alaska:</b>	<25%
<b>Peripheral:</b>	No

## References

Alaska Center for Conservation Science (ACCS). 2017a. Wildlife Data Portal. University of Alaska Anchorage. Available online: <http://aknhp.uaa.alaska.edu/apps/wildlife>

Armstrong, R. H. 2008. Guide to the birds of Alaska, 5th edition. Alaska Northwest Books, Anchorage, AK, USA.

Collins, W. B., D. Williams, and T. Trapp. 2001. Spruce beetle effects on wildlife, 1 July 1997-30 June 2001. Federal aid in wildlife restoration research final performance report, grants W-27-1 through W-27-4, study 1.53, Division of Wildlife Conservatio

Cotter, P. A., and B. A. Andres. 2000a. Breeding bird habitat associations on the Alaska breeding bird survey. Information and Technology Report USGS/BRD/ITR- 2000-0010, Biological Resource Division, U.S. Geological Survey, Springfield, VA, USA.

Derbyshire, R., D. Strickland, and D. R. Norris. 2015. Experimental evidence and 43 years of monitoring data show that food limits reproduction in a food-caching passerine. *Ecology* 96(11):3005–3015. DOI: 10.1890/15-0191.1

Handel, C. M. and Sauer, J. R. 2017. Combined analysis of roadside and off-road breeding bird survey data to assess population change in Alaska. *The Condor* 119(3):557-575. DOI: 10.1650/CONDOR-17-67.1

Handel, C. M., S. A. Swanson, D. A. Nigro, and S. M. Matsuoka. 2009. Estimation of avian population sizes and species richness across a boreal landscape in Alaska. *The Wilson Journal of Ornithology* 121(3):528–547.

Isleib, M. E., and B. Kessel. 1973. Birds of the north Gulf Coast- Prince William Sound region, Alaska. Biological Papers of the University of Alaska no. 14. University of Alaska Fairbanks, AK, USA.

Kessel, B. 1989. Birds of the Seward Peninsula, Alaska: Their biogeography, seasonality, and natural history. University of Alaska Press, Fairbanks, AK, USA.

Lance, E. W., and S. Howell. 2000. Survey of songbirds during a spruce beetle (*Dendroctonus rufipennis*) outbreak on the Kenai Peninsula, Alaska. *Northwestern Naturalist* 81(1):1-10. DOI: 10.2307/3536893.

Marcot, B. G., M. T. Jorgenson, J. P. Lawler, C. M. Handel, and A. R. DeGange. 2015. Projected changes in wildlife habitats in Arctic natural areas of northwest Alaska. *Climate Change* 130(2):145–154. DOI: 10.1007/s10584-015-1354-x

Matsuoka, S. M., C. M. Handel, and D. R. Ruthrauff. 2001. Densities of breeding birds and changes in vegetation in an Alaskan boreal forest following a massive disturbance by spruce beetles. *Canadian Journal of Zoology* 79(9):1678–1690. DOI: 10.1139/cjz-79

Migratory Bird Treaty Act (MBTA). 1918. U.S. Code Title 16 §§ 703-712 Migratory Bird Treaty Act.

McIntyre, C., L. Phillips, and E. Williams. 2017. Climate warming impacts on the persistence of resident birds in Alaska. In Baluss, G., ed. 2016 summary of landbird projects for Boreal Partners in Flight. Boreal Partners in Flight, Anchorage, AK, USA.

Partners in Flight (PIF). 2019. Population Estimates Database, version 3.0. Available online: <http://pif.birdconservancy.org/PopEstimates>. Accessed 09-April-2019.

Quinlan, S. E. 1978. Bird communities and white spruce succession on the Kenai Peninsula, Alaska. Unpublished report. U.S. Department of Agriculture Forest Service, Chugach National Forest, Seward, AK, USA.

Sieving, K. E., and M. F. Willson. 1998. Nest predation and avian species diversity in northwestern forest understory. *Ecology* 79(7):2391–2402.

Spindler, M. A., and B. Kessel. 1980. Avian populations and habitat use in interior Alaska taiga. Final report, University of Alaska Museum, Fairbanks, AK, USA.

Strickland, D., and H. R. Ouellet. 2018. Canada Jay (*Perisoreus canadensis*), version 2.1. In Rodewald, P. G., ed. *The Birds of North America*, Cornell Lab of Ornithology, Ithaca, NY, USA. DOI: 10.2173/bna.40

Thompson, R. G., I. G. Warkentin, and S. P. Flemming. 2008. Response to logging by a limited but variable nest predator guild in the boreal forest. *Canadian Journal of Forest Research* 38(7):1974–1982. DOI: 10.1139/X08-049

Waite, T. A. 1990. Effects of caching supplemental food on induced feather regeneration in wintering Gray Jays *Perisoreus canadensis*: a ptilochronology study. *Ornis Scandinavica* 21(2):122-128.

Waite, T. A. 1991a. Nocturnal hypothermia in Gray Jays *Perisoreus canadensis* wintering in interior Alaska. *Ornis Scandinavica* 22(2):107-110.

Waite, T. A., and D. Strickland. 2006. Climate change and the demographic demise of a hoarding bird living on the edge. *Proceedings of the Royal Society B: Biological Sciences* 273(1603):2809–2813. DOI: 10.1098/rspb.2006.3667

Whelan, S., D. Strickland, J. Morand-Ferron, and D. R. Norris. 2016. Male experience buffers female laying date plasticity in a winter-breeding, food-storing passerine. *Animal Behaviour* 121:61–70. DOI: 10.1016/j.anbehav.2016.08.014

Whelan, S., D. Strickland, J. Morand-Ferron, and D. R. Norris. 2017. Reduced reproductive performance associated with warmer ambient temperatures during incubation in a winter-breeding, food-storing passerine. *Ecology and Evolution* 7(9):3029–3036. DOI: 10

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