# Gyrfalcon

*Falco rusticolus*

Class: Aves
Order: Falconiformes

**Review Status:** No review necessary **Version Date:**

**Conservation Status**

| *NatureServe:* | *Agency:* | | |
|---|---|---|---|
| G Rank: G5 | ADF&G: Species of Greatest Conservation Need | IUCN: Least Concern | Audubon AK: |
| S Rank: S4 | USFWS: | BLM: Watch | |

## Final Rank

Conservation category: **II. Red**

high status and either high biological vulnerability or high action need

| Category | Range | Score |
|---|---|---|
| Status | -20 to 20 | 0 |
| Biological | -50 to 50 | -6 |
| Action | -40 to 40 | -16 |

**Higher numerical scores denote greater concern**

## 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**

*Population Trend in Alaska (-10 to 10)* -6

Considered stable (Alaska Raptor Management Program 2001). Numbers may fluctuate annually in response to prey populations or other environmental variables (Booms et al. 2008).

*Distribution Trend in Alaska (-10 to 10)* 6

Potentially declining. Recent distribution models by Booms et al. (2011a) suggests that habitat in Alaska has decreased in the past 100 years, and this trend is expected to continue in the future.

Status Total: 0

## 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**

*Population Size in Alaska (-10 to 10)* 8

Booms et al. (2010a) estimated the breeding gyrfalcon population in Alaska at 546 ± 180 pairs (equivalent to 732-1452 mature individuals). Because this interval estimate spans two categories, we rank this question as 0.5 * A + 0.5 * B.

*Range Size in Alaska (-10 to 10)* -10

Distributed throughout tundra habitats, but most common north of Brooks Range, parts of Alaska Range, and on the Seward and Lisburne Peninsulas (Booms et al. 2008). Largely absent from interior and southeast Alaska. Some individuals migrate, while other remain on breeding territories year-round. Year-round range is estimated to cover ~600,000 sq. km., calculated in GIS and based on range map from ACCS (2017a).

*Population Concentration in Alaska (-10 to 10)* -10

Does not concentrate; occurs either singly or in pairs (Booms et al. 2008).

*Reproductive Potential in Alaska*

Age of First Reproduction (-5 to 5) -3

Little data available, but likely >2 years (Booms et al. 2008).

Number of Young (-5 to 5) 3

Females lay one brood per year. Clutch size ranges from 1 to 5 eggs, with a mean of $3.72 \pm 0.71$ (Booms et al. 2008). We rank this question as B- 1-2 offspring to take into account the fact that females do not always breed every year (Booms et al. 2008).

*Ecological Specialization in Alaska*

Dietary (-5 to 5) 1

In Alaska, ptarmigan are critically important, comprising anywhere from 25% to 95% of the gyrfalcon's diet (Roseneau 1972; Booms et al. 2008; Potapov 2011). Arctic ground squirrels are also important prey items; research by Robinson et al. (2019b) on the Seward Peninsula suggest that prey size, rather than specific taxa, may be a more important consideration of foraging gyrfalcon during the nesting season. They found that the proportion of ptarmigan or ground squirrel in the diet varied within and between years, perhaps in response to changes in prey availability (Robinson et al. 2019b). Songbirds, shorebirds, and other small mammals are also consumed (Sherrod 1978; Booms et al. 2008; Potapov 2011).

Habitat (-5 to 5) 5

Breeds in tundra habitats above 55°N (Booms et al. 2008). It does not build its own nest, but relies on cliff and cliff-like structures and lays its eggs on rock ledges or in stick nests built by other bird species (Booms et al. 2008). These nesting sites are considered to be relatively rare in Alaska (Booms et al. 2010a; Liebezeit et al. 2012). Indeed, distribution models by Booms et al. (2010a) predicted that 7% of the state had a nest occurrence index value >60%. The availability of suitable nest sites is thought to limit gyrfalcon populations (Booms et al. 2008).

Biological Total: -6

**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 in Alaska (-10 to 10)* -10

Protected under the Migratory Bird Treaty Act (MBTA 1918). Subsistence and recreational harvest is not permitted. Take is permitted for falconry purposes, but is very minimal (ADFG 2018a).

*Knowledge of Distribution and Habitat in Alaska (-10 to 10)* -10

Several studies have addressed the movements and distribution of gyrfalcons in Alaska, including the distribution of nest-sites, juvenile dispersal, and migration routes (e.g. Roseneau 1972; McIntyre et al. 2009; Booms et al. 2010a; Booms et al. 2011b; Eisaguirre et al. 2016). Aerial and boat surveys have also contributed to our understanding oftheir distribution during the breeding season (reviewed in Fuller et al. 2011).

*Knowledge of Population Trends in Alaska (-10 to 10)* 2

Data are only available for certain locations where gyrfalcon or raptor surveys are being conducted

(Booms et al. 2010b; Fuller et al. 2011). These data are currently insufficient for determining statewide population trends. Other multi-species surveys (e.g. PRISM) either do not detect gyrfalcons in sufficient numbers or fall outside of this species' range (Bart et al. 2011).

*Knowledge of Factors Limiting Populations in Alaska (-10 to 10)* 2

Food and nest-site availability are thought to be the main factors regulating population size and densities, while reproductive success is thought to be influenced by food availability and inclement weather (Booms et al. 2008). Some studies outside of Alaska have reported a correlation between population size and the abundance of ptarmigan, with some gyrfalcon populations responding cyclically to changes in ptarmigan populations (Booms et al. 2008). Not all population exhibit these responses; for example, seasonal changes in ptarmigan populations or the availability of alternative prey may dampen the effect of ptarmigan on gyrfalcon (Booms et al. 2008; Robinson et al. 2019b). Few studies have investigated these factors in Alaska. A study by Anderson et al. (2019) on the Seward Peninsula found that the distribution of nesting territories was non-random on the landscape. They did not find a strong relationship between occupancy and the distribution of prey habitat; however, the resolution of their data allowed for only a coarse investigation. Finally, there is some concern about how gyrfalcon will be affected by and respond to climate change, and specifically to increased shrub cover of tundra habitats (Booms et al. 2010a; Liebezeit et al. 2012). Additional work is needed to predict effects of and responses to climate change.

Action Total: -16

## Supplemental Information

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

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

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