Emperor Goose

Class: Aves
Order: Anseriformes

Anser canagicus

Note: Previously referred to as Chen canagica.

Review Status: Peer-reviewed **Version Date:** 27 February 2018

Conservation Status

NatureServe:	*Agency:*		
G Rank: G3G4	ADF&G: Species of Greatest Conservation Need	IUCN: Near Threatened	Audubon AK: Yellow
S Rank: S3S4	USFWS:	BLM: Watch	

Final Rank

Conservation category: **VII. Yellow**

low status and either high biological vulnerability or high action need

Category	Range	Score
Status	-20 to 20	-3
Biological	-50 to 50	2
Action	-40 to 40	-28

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) 2

Population declined sharply in the 1970s and 1980s, but the population is now increasing (PFC 2016a; Fischer et al. 2018). Counts from 2014 to 2016 were the highest recorded since 1983 (PFC 2016a).

Distribution Trend in Alaska (-10 to 10) -5

Unknown, but suspected stable (J. Schmutz, USGS, pers. comm.). Winter distribution has shifted slightly eastward.

Status Total: -3

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) -10

Statewide estimates are unavailable, but >25,000. Counts on spring staging grounds in southwest Alaska estimated a total population size of 85,795 birds (PFC 2016a), but this number likely includes individuals that breed in Russia. This population index was discontinued in 2017 in favour of the total indicated bird index from the Yukon-Kuskokwim Delta (YKD) Coastal Zone Survey (USFWS 2018). The YKD supports 80-90% of the breeding population, and the 2018 index estimated 30,100 (26,600-33,600) breeding individuals (USFWS 2018).

Range Size in Alaska (-10 to 10) -2

Distribution is restricted to the Bering Sea coastlines (PFC 2016a). More than 80% of the population breeds in a small, coastal area on the Yukon-Kuskokwim Delta. The rest of the Alaskan population breeds on the northern Seward Peninsula and a few islands in Bering Sea (PFC 2016a). Overwinters on Russia's Commander Islands west along the Aleutian Chain to the Alaska Peninsula, coastlines of Bristol Bay, and Kodiak Island (PFC 2016a). In Alaska, breeding range is more restricted than wintering range and is estimated at ~15,011 sq. km, calculated in GIS and based on the range map from ACCS (2017a).

Population Concentration in Alaska (-10 to 10) 10

The vast majority of the population breeds along a narrow stretch of coastline on the Yukon-Kuskokwim Delta. Also aggregates on staging grounds; less than a dozen areas have been identified as critical (Hupp et al. 2008a; PFC 2016a).

Reproductive Potential in Alaska

Age of First Reproduction (-5 to 5) 1

Most females begin to breed when they are older than 3 years (Schmutz 2000).

Number of Young (-5 to 5) 1

Average clutch size is between 4 to 6 eggs (PFC 2016a; Daniels and Friendly 2018).

Ecological Specialization in Alaska

Dietary (-5 to 5) 1

On breeding grounds, Emperor Geese are herbivorous, feeding on marsh graminoids and crowberries (Eisenhauer and Kirkpatrick 1977; Laing and Raveling 1993; Schmutz et al. 2011). Grazing lawns are critical forage for goslings (Lake et al. 2008). During migration and on wintering grounds, diet shifts to an intertidal and marine one that includes aquatic invertebrates (e.g. bivalves, polychaete worms), coastal plants, eelgrass, and algae (Petersen 1983; Schmutz 1994; Schmutz et al. 2011).

Habitat (-5 to 5) 1

Mostof the Alaskan population breeds on coastal, saline ponds, mudflats, and marshes on the Yukon-Kuskokwim Delta (Laing and Raveling 1993; Schmutz 2001; Schmutz et al. 2011). These preferred habitats are considered to be uncommon relative to what is available on the landscape (Laing and Raveling 1993; Schmutz 2001). During migration and overwinter, found on volcanic islands and intertidal habitats such as lagoons and mudflats (Petersen and Gill 1982; Schmutz 1994; Schmutz et al. 2011).

Biological Total: 2

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 by the Migratory Bird Treaty Act (MBTA 1918). Hunting was closed in Alaska in 1987 as a result of population declines (PFC 2016a). Sport and subsistence hunting reopened for the first time in 2017 with strong restrictions in place (AMBCC 2017; ADFG 2020c). A management plan is in place for this species (PFC 2016a).

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

Distributiion is well understood during breeding, migration, and wintering, with knowledge of habitat associations (e.g. Petersen and Gill 1982; Hupp et al. 2007; Hupp et al. 2008a; PFC 2016a;

Saalfeld et al. 2017). Habitat studies have been conducted on on the Yukon-Kuskokwim Delta, where >80% of the population breeds (Eisenhauer and Kirkpatrick 1977; Petersen 1990; Laing and Raveling 1993; Schmutz 2001; Saalfeld et al. 2017). Little is known about the ecology of individuals that breed on the Seward Peninsula (Schmutz et al. 2011).

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

Population size on the Yukon-Kuskokwim Delta (YKD) is currently estimated using annual aerial surveys and a total indicated bird index; statistical models have been used to scale this index to total population size (PFC 2016a; USFWS 2018). This bird index is more precise than annual spring counts, which were used from 1981-2016 (PFC 2016a). It does not include birds breeding on the Seward Peninsula or on St. Lawrence or Nunivak Island, which represent only a small percentage of the Alaskan population (PFC 2016a). Several other surveys are conducted annually including nest counts on the YKD, and counts and age ratio surveys on fall staging grounds (reviewed in PFC 2016a).

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

Some knowledge of limiting factors, but the relative importance of each factor to survival and productivity is not well understood, especially on wintering grounds (PFC 2016a). Overhunting contributed to the historic declines of Emperor Geese that were observed in the mid- to late 20th century (PFC 2016a). Other factors include: predation (Petersen 1990; Schmutz et al. 2001; Bowman et al. 2004; Lake et al. 2008), inclement weather (Schmutz et al. 1994; Schmutz et al. 2001), winter food availability (Schmutz et al. 1994), and competition with Cackling Canada Geese (Schmutz 2001; Schmutz and Laing 2002; Lake et al. 2008). Emperor Geese may be sensitive to oil pollution because of their dependency on intertidal habitats (Schmutz et al. 2011).

Action Total: -28

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

Harvest:	Substantial, regulations
Seasonal Occurrence:	Year-round
Taxonomic Significance:	Monotypic species
% Global Range in Alaska:	>10%
% Global Population in Alaska:	≥75%
Peripheral:	No

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