Steller's Eider

Polysticta stelleri

Class: Aves
Order: Anseriformes

Review Status: Peer-reviewed **Version Date:** 30 March 2018

Conservation Status

NatureServe:	*Agency:*		
G Rank: G3	ADF&G: Species of Greatest Conservation Need	IUCN: Vulnerable	Audubon AK: Red
S Rank: S1B,S2S3	USFWS: Listed Threatened	BLM: Sensitive	

Final Rank

Conservation category: **VI. Yellow**

low status and high biological vulnerability and action need

Category	Range	Score
Status	-20 to 20	2
Biological	-50 to 50	8
Action	-40 to 40	4

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) 0

Population trends for the Alaskan breeding population cannot be determined with certainty. Steller's eiders are not always seen during surveys, or are only observed in small numbers (USFWS 2001c). Data from spring and fall surveys cannot be used to determine trends because the majority of the sampled population breeds in Russia (Frost et al. 2013 and references therein).

Distribution Trend in Alaska (-10 to 10) 2

Historical observations suggest that Steller's eiders were more broadly distributed in the first half of the 20th century than they are now (K. Martin, USFWS, pers. comm.). Distribution in western and northern Alaska decreased in the 1970s (Kertell 1991; Flint and Herzog 1999; Quakenbush et al. 2002), but is likely stable now.

Status Total: 2

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

Unknown, but suspected small and potentially <500 individuals. Estimates for the average number of individuals on the Arctic Coastal Plain range from 216 - 422 (95% CI; mean = 308; USFWS 2019). An additional 184 - 225 individuals (95% CI; mean = 204) are estimated to occur in the Utqiaġvik Triangle (USFWS 2019). Steller's eiders used to be locally common in some area of the Yukon-

Kuskokwim Delta, but very few individuals breed there now (Bowman et al. 2015). Because these estimates span 2 scoring categories, we rank this question as 0.5 * A + 0.5 * B.

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

Breeds at low densities on the Arctic Coastal Plain and, to a lesser extent, on the Yukon-Kuskokwim Delta (USFWS 2019). Overwinters on the Alaska Peninsula, Kodiak Island, and the Aleutian Islands (USFWS 2019). Breeding range is more restricted and is estimated to cover ~22,300 sq. km, calculated in GIS and estimated from Fig. 1 in USFWS (2019).

Population Concentration in Alaska (-10 to 10) 2

Number of sites likely between 1 and 25. During breeding, nesting density is highest in the northern portion of the Utqiaġvik Triangle, though individuals occur at low densities on the Arctic Coastal Plain and on the Yukon-Kuskokwim Delta (Quakenbush et al. 2004; USFWS 2019). During molting, most of the population concentrates at a handful of sites on the Alaska Peninsula, as well as on St. Lawrence Island (USFWS 2001c; Martin et al. 2015; Rosenberg et al. 2016b). Rosenberg et al. (2016b) identified six molting areas that were used by individuals overwintering on Kodiak Island, while Martin et al. (2015) identified five such areas for birds breeding in Utqiaġvik.

Reproductive Potential in Alaska

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

Unknown, but likely 3 years old (Quakenbush et al. 2004; K. Martin, USFWS, pers. comm.).

Number of Young (-5 to 5) 1

Females lay a single clutch per year. In Utqiaġvik, researchers reported average clutch sizes between 5.4 and 5.6, with a range from 1 to 8 (Quakenbush et al. 2004; Safine 2013). Although additional research is needed, it is thought that not all females breed every year (Quakenbush et al. 2004).

Ecological Specialization in Alaska

Dietary (-5 to 5) 1

Feeds on a diversity of aquatic plants and invertebrates including mollusks, crustaceans (amphipods, zooplankton), and insects (Petersen 1980; Petersen 1981b; Fredrickson 2001). That being said, Steller's eiders seem to be highly associated with eelgrass beds and with shallow, protected shorelines that likely have a consistent community of prey items, suggesting some degree of specialization. We therefore rank this question as B- Moderately adaptable.

Habitat (-5 to 5) 1

Nests in low-lying tundra on grassy edges of shallow lakes and ponds, near streams, and on flooded wetlands (Quakenbush et al. 2004; Bowman et al. 2015). Nest sites are often associated with pendant grass (Arctophila fulva) or water sedge (Carex aquatilis) (Quakenbush et al. 2004; Rojek 2008; Safine 2013). During molting, uses intertidal habitat in shallow estuaries and lagoons (Petersen 1981b; Bowman et al. 2015). Eelgrass habitat, sand flats, and mudflats are often frequented, possibly because they harbor high levels of prey items (Frederickson 2001). Little is known about the wintering habitat, but recent research suggest that they use deep (>30 m), offshore waters (Martin et al. 2015).

Biological Total: 8

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). Listed as Threatened under the U.S. Endangered Species Act; a recovery plan is in place (USFWS 2002a). Recreational and subsistence harvest is prohibited (AMBCC 2020), but birds are still taken; estimates exceed 100 birds in some years (Naves 2015).

Knowledge of Distribution and Habitat in Alaska (-10 to 10) 2

Breeding distribution and habitat associations are known (see Habitat section; reviewed in USFWS 2019). Non-breeding distribution and habitat use has been studied on the Alaska Peninsula, the Aleutian Islands, and Cook Inlet (e.g. Petersen 1981b; Laubhan and Metzner 1999; Larned 2006; Reed and Flint 2007; Martin et al. 2015; Rosenberg et al. 2016b). However, recent findings suggest that our knowledge of their distribution and habitat use remains incomplete. For example, Rosenberg et al. (2016b) identified Kamishak Bay as an important molting area; Steller's eiders were not known to use this area prior to this study. Similarly, this species was believed to inhabit shallow waters during the winter, but Martin et al. (2015) also documented use of deeper, offshore habitats.

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

Monitored locally, but data are inadequate to determine trends. Three main surveys are used to estimate population size in northern Alaska: the Arctic Coastal Plain survey, the North Slope Eider Survey, and the Utqiaġvik Triangle survey (Stehn and Platte 2009). Obtaining accurate estimates of population size is difficult because this species breeds at very low densities, and there is high variation both across years and across surveys (USFWS 2001c; Stehn and Platte 2009). Spring and fall surveys cannot be used to estimate trends for Alaskan-breeding populations because most of the sampled population breeds in Russia (Frost et al. 2013).

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

There is little agreement on the factors that are limiting population grwoth. Causes of population declines are unclear (Quakenbush et al. 2002; USFWS 2002a; 2019). Habitat loss and environmental pollutants are not believed to be major limiting factors, though lead poisoning may be of concern in areas of high human use (Quakenbush et al. 2002; Stout et al. 2002; USFWS 2002a; Miller et al. 2016). Although this species is closed to harvest, Steller's eiders are still shot; estimates exceed 100 birds in some years (Naves 2015). Given the size of the breeding population in Alaska, this rate may be substantial (USFWS 2019). Additional research is needed to determine the effects of bacteria and disease such as avian influenza (Ip et al. 2008; Hollmén et al. 2011; Wilson et al. 2013).

Frost et al. (2013) reported relatively high rates of adult survival for males and females staging at Izembek Lagoon. Steller's Eiders near Utqiaġvik have extremely low productivity (Quakenbush et al. 2004). Predators were the cause of most nest failures and duckling mortalities (Quakenbush et al. 2004). Predator control programs were conducted from 2005-2016; it is still uncertain whether these efforts have had a significant effect on survival rates (Safine 2013; Dunham and Grand 2017).

Because this species is restricted to northern latitudes throughout the year, it may be particularly susceptible to climate change (Fuller et al. 2008; Bowman et al. 2015). For example, changes in the distribution and abundance of zooplankton and other prey species have been documented in response to warming events in the Bering Sea, which may affect survival (Frost et al. 2013).

Action Total: 4

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 genus
% Global Range in Alaska:	>10%
% Global Population in Alaska:	≥75%
Peripheral:	No

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