

Cassin's Auklet

Ptychoramphus aleuticus

Class: Aves

Order: Charadriiformes

Review Status: Peer-reviewed

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Conservation Status

Table 1 Conservation status according to state, national, and international organizations and agencies.

Organization	Rank
NatureServe	G4/S4
ADF&G	Species of Greatest Conservation Need
IUCN	Near Threatened
Audubon AK	Watch

Final Rank

Conservation Category: **VII. Yellow**

Low status and either high biological vulnerability or high action need

Table 2 ASRS categorical scores. Higher numerical scores denote greater concern.

Category	Range	Score
Status	-20 to 20	4
Biological	-50 to 50	-22
Action	-40 to 40	4

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).

Population Trend in Alaska (-10 to 10)

Colonies breeding on the Aleutian Islands likely experienced historic declines due to the introduction of mammalian predators but are likely stable or recovering following predator eradication (Byrd et al. 2005). Current trends are not well-understood. Cassin's Auklets along North America's Pacific coast are influenced by one of two oceanographic domains: the California Current System and the Alaska Current System. Populations influenced by the California Current System appear to be declining, however, limited data from northern British Columbia suggest that populations in the Alaska Current System are either stable or increasing (COSEWIC 2014b). Unfortunately, data for Alaska are very limited and cannot be used to

determine trends. We tentatively rank this question as C- Past declines but acknowledge that a ranking of B- Suspected declines may be more appropriate should new data become available.

Score: 2

Distribution Trend in Alaska (-10 to 10)

The introduction of mammalian predators such as rats and foxes to the Aleutian Islands likely led to the historical extirpation of colonies (Byrd et al. 2005). Eradication efforts has likely led to the reestablishment of some colonies, and we assume that the distribution is currently stable.

Score: 2

Status Total: 4

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).

Population Size in Alaska (-10 to 10)

No recent data available, but >25,000. Denlinger (2006) estimated that there were 473,000 individuals in Alaska and Byrd *et al.* (2005) estimated that there were 118,640 individuals on the Aleutian Islands.

Score: -10

Range Size in Alaska (-10 to 10)

Occurs year-round from the Aleutian Chain east along the Alaska Peninsula, Kodiak Island, and Southcentral, to Southeast Alaska (Ainley *et al.* 2011). Estimated range is 226,000 sq. km, based on range map from ACCS (2017a).

Score: -8

Population Concentration in Alaska (-10 to 10)

Breeds in scattered colonies throughout its range. There are an estimated 53 colonies in Alaska (Denlinger 2006).

Score: -6

Reproductive Potential in Alaska

Age of First Reproduction (-5 to 5)

Unknown for Alaska. In California, most females begin breeding at 3 years (Ainley et al. 2011).

Score: -3

Number of Young (-5 to 5)

Lays one, single-egg clutch per year (Ainley et al. 2011). May attempt to renest if the first egg is lost (Ainley et al. 2011).

Score: 3

Ecological Specialization in Alaska

Dietary (-5 to 5)

Consumes primarily copepods and euphausiids; to a lesser degree, consumes larvae of fish and marine invertebrates such as squids and crab (Ainley *et al.* 2011; Hipfner *et al.* 2020). In a 22-year study off the coast of British Columbia, Hipfner *et al.* (2020) found that 99% of the copepod biomass delivered to nestlings was comprised of a single species, *Neocalanus cristatus*, even though the percent biomass of this species in zooplankton tows varied greatly from year to year. Similarly, 98% of the euphausiid biomass fed to nestlings was dominated by 3 species (Hipfner *et al.* 2020). Thus, although diet changes spatially and annually, Cassin's auklet appear to have a narrow range of preferred dietary items, especially for items that are fed to nestlings.

Score: 1

Habitat (-5 to 5)

Nesting colonies are located on islands spanning a range of topographies, vegetation communities, and tree cover (Ainley *et al.* 2011). The Cassin's auklet is considered a "burrow nester": nests are placed in rock crevices and cavities, under driftwood or other debris, or dug within the earth (Denlinger 2006). These birds visit their nests at night, otherwise their time is spent on inshore marine waters during breeding season, and offshore marine waters when not breeding. The at-sea distribution of Cassin's auklet is likely related to food availability and includes shelf breaks and upwelling where zooplankton are abundant (Sydeman *et al.* 2010; Ainley *et al.* 2011).

Score: 1

Biological Total: -22

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 to lack of knowledge or conservation action. Action scores range from -40 (lower needs) to 40 (greater needs).

Management Plans and Regulations in Alaska (-10 to 10)

Protected under the Migratory Bird Treaty Act (MBTA 1918). Open to subsistence harvest and subject to closed seasons (AMBCC 2020). Subsistence rates of auklets where Cassin's auklet does occur is minimal (Naves 2018).

Score: -10

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

Habitat associations and distribution generally known from surveys and observations (Byrd *et al.* 2005; Sydeman *et al.* 2010). Additional research is needed to document specific habitat associations, both at nesting colonies and at-sea.

Score: 2

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

Not currently monitored.

Score: 10

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

The most supported factor limiting populations of Cassin's auklet is food availability. The availability of key prey species is crucial for many aspects of their survival and reproduction, including timing of breeding, hatch date, nestling growth rates, and survival of nestlings and adults (Abraham and Sydeman 2004; Ainley et al. 2011; Jones et al. 2018; Hipfner et al. 2020). Such declines in food availability are often related to ocean climate patterns and anomalies (Wolf et al. 2009; COSEWIC 2014b; Jones et al. 2018; Hipfner et al. 2020). Historically, the introduction of mammalian predators to islands that supported nesting colonies had a strong, negative effect on population numbers in Alaska and elsewhere (Byrd et al. 2005; COSEWIC 2014b). The role of predators is less important now that many of these predators have been extirpated, but the current distribution of nesting colonies still reflects those declines (Byrd et al. 2005). Ingestion of plastics is a potential threat and a topic of active research (Floren and Shugart 2017; O'Hara et al. 2019).

Score: 2

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: Not substantial

Seasonal Occurrence: Year-round

Taxonomic Significance: Monotypic genus

% Global Range in Alaska: >10%

% Global Population in Alaska: <25%

Peripheral: No

References

- Abraham, C. L., and W. J. Sydeman. 2004. Ocean climate, euphausiids and auklet nesting: inter-annual trends and variation in phenology, diet and growth of a planktivorous seabird, *Ptychoramphus aleuticus*. Marine Ecology Progress Series 274:235–250. DOI: 10.3354/meps274235
- Alaska Center for Conservation Science (ACCS). 2017a. Wildlife Data Portal. University of Alaska Anchorage. Available online: <http://aknhp.uaa.alaska.edu/apps/wildlife>
- Ainley, D. G., D. A. Manuwal, J. Adams, and A. C. Thoresen. 2020. Cassin's Auklet (*Ptychoramphus aleuticus*), version 1.0. In Poole, A. F., ed. Birds of the World. Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.casauk.01>
- Alaska Migratory Bird Co-Management Council (AMBCC). 2020. Regulations for the 2020 Alaska Subsistence Spring/Summer Migratory Bird Harvest. Office of the Alaska Migratory Bird Co-Management Council, U.S. Fish & Wildlife Service, Anchorage, AK, USA.
- Byrd, G. V., H. M. Renner, and M. Renner. 2005. Distribution patterns and population trends of breeding seabirds in the Aleutian Islands. Fisheries Oceanography 14(S1):139–159. DOI: 10.1111/j.1365-2419.2005.00368.x

- COSEWIC. 2014b. COSEWIC Assessment and Status Report on the Cassin's Auklet *Ptychoramphus aleuticus* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON, CAN.
- Denlinger, L. M., comp. 2006. Alaska Seabird Information Series. Unpublished report, U.S Fish and Wildlife Service, Migratory Bird Management, Anchorage, AK, USA.
- Floren, H. P., and G. W. Shugart. 2017. Plastic in Cassin's auklets (*Ptychoramphus aleuticus*) from the 2014 stranding on the Northeast Pacific Coast. Marine Pollution Bulletin 117(1–2):496–498. DOI: 10.1016/j.marpolbul.2017.01.076
- Hipfner, J. M., M. Galbraith, D. F. Bertram, and D. J. Green. 2020. Basin-scale oceanographic processes, zooplankton community structure, and diet and reproduction of a sentinel North Pacific seabird over a 22-year period. Progress in Oceanography 182:102290. DOI: 10.1016/j.pocean.2020.102290
- Jones, T., J. K. Parrish, W. T. Peterson, E. P. Bjorkstedt, N. A. Bond, L. T. Ballance, ..., and J. Harvey. 2018. Massive Mortality of a Planktivorous Seabird in Response to a Marine Heatwave. Geophysical Research Letters 45(7):3193–3202.
- Migratory Bird Treaty Act (MBTA). 1918. U.S. Code Title 16 §§ 703-712 Migratory Bird Treaty Act.
- Naves, L. C. 2018. Geographic and seasonal patterns of seabird subsistence harvest in Alaska. Polar Biology 41(6):1217–1236. DOI: 10.1007/s00300-018-2279-4
- O'Hara, P. D., S. Avery-Gomm, J. Wood, V. Bowes, L. Wilson, ..., and P. S. Ross. 2019. Seasonal variability in vulnerability for Cassin's auklets (*Ptychoramphus aleuticus*) exposed to microplastic pollution in the Canadian Pacific region. Science of The Total Environment 649:50–60. DOI: 10.1016/j.scitotenv.2018.08.238
- Sydeman, W., S. Thompson, J. Santora, M. Henry, K. Morgan, and S. Batten. 2010. Macroecology of plankton-seabird associations in the North Pacific Ocean. Journal of Plankton Research 32:1697-1713.
- Wolf, S. G., W. J. Sydeman, J. M. Hipfner, C. L. Abraham, B. R. Tershy, and D. A. Croll. 2009. Range-wide reproductive consequences of ocean climate variability for the seabird Cassin's Auklet. Ecology 90(3):742–753.