

# Horned Puffin

Class: Aves  
Order: Charadriiformes

*Fratercula corniculata*

**Review Status:** Peer-reviewed

**Version Date:** 11 February 2019

## Conservation Status

NatureServe:

Agency:

G Rank: G5

ADF&G: Species of Greatest Conservation Need

IUCN: Least Concern

Audubon AK: Red

S Rank: S5

USFWS:

BLM:

| Final Rank  |              |              |
|---|--------------|--------------|
| Conservation category: <b>V. Orange</b>                                     |              |              |
| unknown status and either high biological vulnerability or high action need |              |              |
| <u>Category</u>   | <u>Range</u> | <u>Score</u> |
| Status  | -20 to 20    | 0            |
| Biological  | -50 to 50    | -22          |
| Action  | -40 to 40    | 4            |
| <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**

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

0

Unknown. All trend estimates are out of date and reliable estimates are difficult to obtain (Denlinger 2006).

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

0

In the mid-1980s, a small colony became established on Cooper Island, east of Utqiagvik (Divoky 2010). Statewide trends are unknown.

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)*

-10

Estimated at 921,000 individuals (Denlinger 2006).

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

-2

During breeding, inhabits coastal regions and oceanic islands from Cape Lisburne west to the Aleutian Islands and south to southeast Alaska (Piatt and Kitaysky 2002a). A small colony also occurs on Cooper Island in the Beaufort Sea (Denlinger 2006). Overwinters at sea in the North Pacific Ocean and the southern Bering Sea (Piatt and Kitaysky 2002a). Estimated breeding range is ~96,000 sq. km, calculated in GIS and based on range map from ACCS (2017a).

|  |     |
|--|-----|
| <i>Population Concentration in Alaska (-10 to 10)</i>  | -10 |
| <i>&gt;250 breeding colonies in Alaska (Denlinger 2006; USFWS 2013d).</i>  |     |
| <i>Reproductive Potential in Alaska</i>  |     |
| <u>Age of First Reproduction (-5 to 5)</u>   | 1   |
| Unknown, but likely >2 year. Most individuals probably do not breed until at least their fourth or fifth year (Piatt and Kitaysky 2002a).  |     |
| <u>Number of Young (-5 to 5)</u>   | 3   |
| Females lay a single egg per year (Piatt and Kitaysky 2002a).  |     |
| <i>Ecological Specialization in Alaska</i>   |     |
| <u>Dietary (-5 to 5)</u>   | -5  |
| Diver and generalist predator (Sydeman et al. 2018b). Consumes a variety of forage fishes and marine invertebrates (Wehle 1982; Hatch and Sanger 1992; Harding et al. 2003; Sydeman et al. 2017b). Chicks are fed fish almost exclusively, whereas adults consume a broader variety of prey (Piatt and Kitaysky 2002a). Diet varies spatially and temporally in response to prey availability (Hatch and Sanger 1992; Sydeman et al. 2017b). |     |
| <u>Habitat (-5 to 5)</u>   | 1   |
| Inhabits coastlines and remote oceanic islands. Usually nests in rock crevices in cliffs and boulder fields, but at some locations excavates burrows in soft substrates (Kessel 1989; Byrd et al. 2005; Gibson and Byrd 2007). Forages in nearshore and offshore waters (Kessel 1989; Piatt and Kitaysky 2002a; Gibson and Byrd 2007; Hunt et al. 2014).   |     |
| <b>Biological Total:</b>   | -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 of lack of knowledge or conservation action. Action scores range from -40 (lower needs) to 40 (greater needs).

**Score**

|  |     |
|--|-----|
| <i>Management Plans and Regulations in Alaska (-10 to 10)</i>  | -10 |
| Protected under the Migratory Bird Treaty (MBTA 1918). Open to subsistence harvest, but subject to regulations (AMBCC 2018).   |     |
| <i>Knowledge of Distribution and Habitat in Alaska (-10 to 10)</i>   | 2   |
| Distribution of colonies is documented and available through the North Pacific Seabird Data Portal (USFWS 2013d), with knowledge of nesting and foraging habitats (Kessel 1989; Piatt and Kitaysky 2002a; Byrd et al. 2005; Gibson and Byrd 2007; Hunt et al. 2014). At-sea has been documented largely through shipboard surveys compiled in the USGS North Pacific Pelagic Seabird Database (Piatt and Drew 2015; also see summary table in Jahncke et al. 2008) and in a few multi-species studies (Hunt et al. 2014; Wong et al. 2014; Cushing et al. 2018). Non-breeding distribution is not well understood. |     |
| <i>Knowledge of Population Trends in Alaska (-10 to 10)</i>  | 10  |
| Although reproductive parameters are monitored at a few colonies, no data are currently available to assess population trends (Dragoo et al. 2018). Reliable colony counts are hard to obtain because of this species' crevice-nesting behavior (Denlinger 2006).  |     |
| <i>Knowledge of Factors Limiting Populations in Alaska (-10 to 10)</i>   | 2   |
| Population dynamics are hard to study because data on population size and trends are largely unavailable. Research on horned puffins and other piscivorous alcids have speculated that population growth rates are affected by climate-related changes in prey availability (Agler et al. 1999; Kitaysky   |     |

and Golubova 2000; Goyert et al. 2018), but the sensitivity to changes in prey availability varies by species (Goyert et al. 2018). Horned puffins can maintain high reproductive success even during prolonged food shortages, but the effects on other population parameters and for longer time scales are unknown (Harding et al. 2003). Unlike tufted puffins, horned puffins are not thought to have been drastically affected by introduced predators on the Aleutian Islands (Byrd et al. 2005), but predation by Arctic ground squirrels may limit some colonies in the Gulf of Alaska (Pollom et al. 2015a). Subsistence harvest rates are not a current concern (Naves 2018). Additional data are needed to determine the impacts of gillnet fisheries (Denlinger 2006) and nest site availability.

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.

|                                       |                   |
|---------------------------------------|-------------------|
| <b>Harvest:</b>                       | Not substantial   |
| <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> | ≥75%              |
| <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>
- Agler, B. A., S. J. Kendall, D. B. Irons, and S. P. Klosiewski. 1999. Declines in marine bird populations in Prince William Sound, Alaska coincident with a climatic regime shift. *Waterbirds: The International Journal of Waterbird Biology* 22(1):98-103. DOI: 10.2307/1521998
- 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
- Cushing, D. A., D. D. Roby, and D. B. Irons. 2018. Patterns of distribution, abundance, and change over time in a subarctic marine bird community. *Deep Sea Research Part II* 147:148–163. DOI: 10.1016/j.dsr2.2017.07.012
- Denlinger, L. M., comp. 2006. Alaska Seabird Information Series. Unpublished report, U.S Fish and Wildlife Service, Migratory Bird Management, Anchorage, AK, USA.
- Divoky, G. 2010. Waiting for the puffins. Friends of Cooper Island, Seattle, WA, USA. Available online: <http://cooperisland.org/waiting-for-the-puffins> Accessed 20-Nov-2018.
- Dragoo, D. E., H. M. Renner, and R. S. A. Kaler. 2019. Breeding status and population trends of seabirds in Alaska, 2018. AMNWR 2019/03, U.S. Fish and Wildlife Service, Homer, AK, USA.
- Gibson, D. D., and G. V. Byrd. 2007. *Birds of the Aleutian Islands, Alaska*. Nuttall Ornithological Club, Cambridge, MA, USA.
- Harding, A. M. A., J. F. Piatt, and K. C. Hamer. 2003. Breeding ecology of horned puffins (*Fratercula corniculata*) in Alaska: Annual variation and effects of El Niño. *Canadian Journal of Zoology* 81(6):1004–1013. DOI: 10.1139/z03-075
- Hatch, S. A., and G. A. Sanger. 1992. Puffins as samplers of juvenile pollock and other forage fish in the Gulf of Alaska. *Marine Ecology Progress Series* 80:1–14. DOI: 10.3354/meps080001
- Hunt, G. L., M. Renner, and K. Kuletz. 2014. Seasonal variation in the cross-shelf distribution of seabirds in the southeastern Bering Sea. *Deep Sea Research Part II: Topical Studies in Oceanography* 109:266–281. DOI: 10.1016/j.dsr2.2013.08.011
- Kessel, B. 1989. *Birds of the Seward Peninsula, Alaska: Their biogeography, seasonality, and natural history*. University of Alaska Press, Fairbanks, AK, USA.

Kitaysky, A. S., and E. G. Golubova. 2000. Climate change causes contrasting trends in reproductive performance of planktivorous and piscivorous alcids. *Journal of Animal Ecology* 69(2):248–262. DOI: 10.1046/j.1365-2656.2000.00392.x

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

Piatt, J. F., and A. S. Kitaysky. 2002a. Horned Puffin (*Fratercula corniculata*). In Poole, A. F., and F. B. Gill, eds. *The Birds of North America*, Cornell Lab of Ornithology, Ithaca, NY, USA. DOI: 10.2173/bna.603

Pollom, E. L., J. P. Gorey, and N. A. Rojek. 2015a. Biological monitoring at Chowiet Island, Alaska in 2015. Report AMNWR 2015/13, Alaska Maritime National Wildlife Refuge, U.S. Fish and Wildlife Service, Homer, AK, USA.

Sydeman, W. J., J. F. Piatt, S. A. Thompson, M. García-Reyes, S. A. Hatch, M. L. Arimitsu, ..., and H. M. Renner. 2017. Puffins reveal contrasting relationships between forage fish and ocean climate in the North Pacific. *Fisheries Oceanography* 26(4):379–395. DOI: 10.1111/fog.12204

U.S. Fish and Wildlife Service (USFWS). 2013d. North Pacific Seabird Data Portal. Available online: [axiom.seabirds.net/maps/north-pacific-seabirds/](http://axiom.seabirds.net/maps/north-pacific-seabirds/) Accessed 2019-10-29.

Wehle, D. H. S. 1982. Food of adult and subadult tufted and horned puffins. *The Murrelet* 63(2):51-58. DOI: 10.2307/3533828

Wong, S. N. P., C. Gjerdrum, K. H. Morgan, and M. L. Mallory. 2014. Hotspots in cold seas: the composition, distribution, and abundance of marine birds in the North American Arctic. *Journal of Geophysical Research: Oceans* 119(3):1691–1705. DOI: 10.1002/2013JC009198

---

Alaska Center for Conservation Science  
Alaska Natural Heritage Program  
University of Alaska Anchorage  
Anchorage, AK