Spotted seal

Phoca largha

Class: Mammalia
Order: Carnivora

Review Status: Peer-reviewed **Version Date:** 03 April 2018

Conservation Status

NatureServe:	*Agency:*		
G Rank: G4G5	ADF&G: Species of Greatest Conservation Need	IUCN: Least Concern	Audubon AK:
S Rank: S3S4	USFWS:	BLM:	

Final Rank

Conservation category: **III. Orange**

high status and low biological vulnerability and action need

Category	Range	Score
Status	-20 to 20	6
Biological	-50 to 50	-30
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)	0
Population trends are unavailable for this species (Muto et al. 2019).	
Distribution Trend in Alaska (-10 to 10)	6
Unknown, but likely declining as a result of reductions in sea ice habitat (Laidre et al. 2008).	
Status Total:	6

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
Uncertain, but >25,000. Minimum population estimate is 423,237 (based on 2012 surveys; Muto et al. 2019).	
Range Size in Alaska (-10 to 10)	-10
Ranges throughout the continental shelf of the Bering Sea north to the Chukchi Sea, east to the Beaufort Sea and west to Russia (Muto et al. 2019). In the summer, uses sea ice and terrestrial haul-out sites along the coast of the Yukon-Kuskokwim Delta, the Seward Peninsula, and the Arctic Coastal Plain (Frost et al. 1993; Lowry et al. 1998). Muto et al. (2019) describes "a large segment of the breeding area" (i.e. the eastern Bering Sea) as ~280,000 sq. km; assuming that all (or most) of the Chukchi and Beaufort Sea shelf is within the range of the spotted seal, we estimate range size to be	

>400,000 sq. km.

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

Haul out on land in large concentrations, sometimes >1,000 (Frost et al. 1993). Additional research are needed to identify important haul-out sites; however, given that group size at these sites is comparatively small relative to population size and range size (e.g. Citta et al. 2018) , we estimate that the number of sites is >250.

Reproductive Potential in Alaska

Age of First Reproduction (-5 to 5) 1

Although the minimum age at sexual maturity is 2-3 years, on average females reach sexual maturity at 4 or 5 years (reviewed in Boveng et al. 2009).

Number of Young (-5 to 5) 3

Females can give birth to one pup every year b(reviewed in Boveng et al. 2009).

Ecological Specialization in Alaska

Dietary (-5 to 5) -5

Mostly fish, including cod, herring, salmon, and walleye (Bukhtiyarov et al. 1984; Lowry et al. 2000; Dehn et al. 2007; Boveng et al. 2009). Aquatic invertebrates such as octopus, shrimp, and amphipods, are also consumed, but to a lesser extent (Bukhtiyarov et al. 1984; Dehn et al. 2007). Spotted seals have a generalist diet and feed on both pelagic and benthic species (Dehn et al. 2007; Boveng et al. 2009; Cooper et al. 2009). Prey species vary based on age, geographic distribution, abundance, and seasonal availability, suggesting flexibility in diet (Bukhtiyarov et al. 1984; Dehn et al. 2007).

Habitat (-5 to 5) 1

Found in continental shelf waters (<200 m deep) in sub-arctic and arctic waters (Lowry et al. 2000; Citta et al. 2018). They rely on sea ice in the winter and in spring during breeding and pup-rearing. The eastern Bering Sea has an extensive continental shelf and spotted seals are broadly distributed along and up to 300 km north of the sea ice-open water boundary (Lowry et al. 2000). Spotted seals are flexible in the type and location of sea ice they use (Lowry et al. 2000), though a preference for the ice edge has often been noted (Lowry et al. 1998; Simpkins et al. 2003 and references therein). In late summer, they make greater use of nearshore areas (Lowry et al. 2000). Unlike other ice seals, spotted seals use terrestrial habitats such as sandbars and coastal beaches as haul-out sites in late summer (Frost et al. 1993; Lowry et al. 1998; Lowry et al. 2000). In the western Pacific, terrestrial haul-outs have also been used during pup-rearing (Boveng et al. 2009). The use of terrestrial habitats as haul-out sites makes them less dependent on sea ice than other seal species (Lowry et al. 1998).

Biological Total: -30

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 through the Marine Mammal Protection Act (NMFS 2015), and actively managed by NOAA's National Marine Fisheries Service (NMFS; https://alaskafisheries.noaa.gov/pr). Subsistence harvest is permitted for Native Alaskans and harvest regulations are co-managed by the Ice Seal Committee and NOAA Fisheries (www.fakr.noaa.gov/protectedresources/seals/ice.htm).

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

Recent aerial and ship-based surveys have provided valuable information on the distribution of spotted seals in the Bering Sea (Conn et al. 2014a; Ver Hoef et al. 2014) and the Chukchi Sea (Aerts et al. 2013). Habitat associations and fine-scale movements have also been studied (Frost et al. 1993; Lowry et al. 1998; Lowry et al. 2000; Simpkins et al. 2003; Citta et al. 2018).

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

Aerial surveys are conducted sporadically and recent surveys have focused on the Bering Sea (Conn et al. 2014a; Ver Hoef et al. 2014). Models have been built using these data to estimate population size, while taking into account detection rates and observer error (Conn et al. 2014a; Ver Hoef et al. 2014). Long-term data and data for the Chukchi and Beaufort Seas are not available at this time, precluding us for determining population trends.

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

Additional research is needed on factors that affect the population of spotted seals in Alaska. Loss of sea ice due to climate change may negatively affect seals directly and indirectly by impacting the distribution and abundance of their prey (Boveng et al. 2009). Laidre et al. (2008) considered that spotted seals were "moderately sensitive" to climate change given its use (but not complete dependence on) of sea ice as habitat. However, data on spotted seals are limited and we lack a good understanding of this species' resilience and capacity to adapt. Data on subsistence harvest and incidental take by fisheries are lacking, but given the size of the population, these factors are not thought to be a concern (Muto et al. 2019). Levels of environmental contaminants (e.g. organochlorines, algal toxins) appear to be low (Neale et al. 2007; Lefebvre et al. 2016). Little is known about the role of predation, disease, and parasites (Boveng et al. 2009).

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:	Not substantial
Seasonal Occurrence:	Year-round
Taxonomic Significance:	Monotypic species
% Global Range in Alaska:	>10%
% Global Population in Alaska:	25-74%
Peripheral:	No

References

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