

Pacific Harbor seal

Class: Mammalia

Order: Carnivora

Phoca vitulina richardii

Note: Only one subspecies of harbor seal, *Phoca vitulina richardii*, occurs in Alaska. Twelve stocks are recognized in Alaska; this assessment considers all stocks simultaneously.

Review Status: Peer-reviewed

Version Date: 12 April 2018

Conservation Status

NatureServe: Agency:

G Rank: G5T5Q ADF&G: Species of Greatest Conservation Need IUCN: Least Concern Audubon AK:

S Rank: S4S5 USFWS: BLM:

Final Rank		
Conservation category: III. Orange		
high status and low biological vulnerability and action need		
<u>Category</u>	<u>Range</u>	<u>Score</u>
Status	-20 to 20	10
Biological	-50 to 50	-30
Action	-40 to 40	-20
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)

4

Important population declines were noted in several parts of Alaska between the late 1970s and the late 2000s (e.g. Pitcher 1990; Frost et al. 1999; Jemison et al. 2006; Small et al. 2008; Womble et al. 2010). Recent surveys suggest stable trends throughout most of their Alaskan range, though some populations are decreasing (Small et al. 2003; Womble et al. 2010; Hoover-Miller et al. 2011; Muto et al. 2019). In addition, populations have not yet recovered from their historic declines (Trites et al. 2007b; S. Karpovich, ADF&G, pers. comm.). We therefore rank this question as $0.5 * B + 0.5 * C$.

Distribution Trend in Alaska (-10 to 10)

6

The retreat of glaciers has led to the disappearance of haul-out sites and a possible emigration of harbor seals from certain areas such as Glacier Bay (Womble et al. 2010). These ice habitats are continuing to disappear as a result of climate change.

Status Total: 10

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

>25,000. Estimated population size is 205,090 (Muto et al. 2019).

<i>Range Size in Alaska (-10 to 10)</i>	-10
Occurs in coastal waters from southeast Alaska west to the Aleutian Islands and north to Nunivak Island (Muto et al. 2019). Also found near the Pribilof Islands (Muto et al. 2019). Interestingly, a small population (~400 individuals) of freshwater harbor seals is found in Iliamna Lake on the Alaska Peninsula (Boveng et al. 2018). Estimated range size is >400,000 sq. km.	
<i>Population Concentration in Alaska (-10 to 10)</i>	-10
Harbor seals aggregate at haul-out sites, which can be comprised of several thousand individuals (see Womble et al. 2010). Many haul-out sites exist in Alaska. Boveng et al. (2003) counted 299 haul-out sites in the Gulf of Alaska alone.	
<i>Reproductive Potential in Alaska</i>	
<u>Age of First Reproduction (-5 to 5)</u>	1
In the Gulf of Alaska, Hutchinson et al. (2016) reported a minimum age of 3 years and an average age of 4.2 years.	
<u>Number of Young (-5 to 5)</u>	3
Females give birth to one pup annually (Lawson and Renouf 1987), but may not give birth every year if they are nutritionally stressed.	
<i>Ecological Specialization in Alaska</i>	
<u>Dietary (-5 to 5)</u>	-5
Opportunistically feed on a variety of fish (e.g. walleye pollock, capelin, herring, sand lance) and marine invertebrates (e.g. cephalopods, shrimp) (Pitcher 1980; Herreman et al. 2009). Diet appears to vary over space and time in response to prey availability (Herreman et al. 2009).	
<u>Habitat (-5 to 5)</u>	1
Usually found in estuaries, bays, and marine waters relatively close to shore (<100 km away), though movements into deeper waters or upriver have also been recorded (Lowry et al. 2001; Small et al. 2005). Harbor seals haul out on glacial ice and on land (e.g. beaches, islands) during molting, pupping, and breeding. In Alaska, it is estimated that about 10% of the population relies on glacial ice as haul-out sites (Bengston et al. 2007). Many tidewater glacial inlets contain disproportionately large numbers of pupping harbor seals, suggesting that these sites provide important pupping and breeding habitats (Calambokidis et al. 1987; Hoover-Miller and Armato 2017). The loss of glacial ice as haul-out platforms may therefore affect more than 10% of the population. Nevertheless, the use of terrestrial haul-outs and the flexible behavior of "ice" harbor seals suggest a certain degree of adaptability (Hoover-Miller et al. 2011).	
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

<i>Management Plans and Regulations in Alaska (-10 to 10)</i>	-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 (Muto et al. 2019).	
<i>Knowledge of Distribution and Habitat in Alaska (-10 to 10)</i>	-10
Distribution and habitat associations have been described across many parts of its range (e.g. Calambokidis et al. 1987; Lowry et al. 2000; Lowry et al. 2001; Small et al. 2005; Savarese and Burns 2010; Boveng et al. 2012; Womble and Gende 2013; Womble et al. 2014)	

<i>Knowledge of Population Trends in Alaska (-10 to 10)</i>	-2
<p>Since 2010, annual aerial surveys are conducted throughout most of their range (Muto et al. 2019). As a result, population estimates and short-term trends are available. Long-term data are available for only a few of the monitored sites (Muto et al. 2019).</p>	
<i>Knowledge of Factors Limiting Populations in Alaska (-10 to 10)</i>	2
<p>Declines of harbor seals are part of a broader pattern observed in other marine mammals, suggesting that similar factors may be limiting these species or otherwise preventing their recovery (Jemison and Kelly 2001; DeMaster et al. 2006; Trites et al. 2007b; Small et al. 2008). Potential limiting factors include: competition for food (interspecific or with fisheries; Jemison and Kelly 2001; Mathews and Pendleton 2006; Herreman et al. 2009), predation (Taggart et al. 2005; Mathews and Pendleton 2006; Herreman et al. 2009; Mathews and Adkinson 2010), disease (e.g. brucellosis; Hueffer et al. 2013; Hoover-Miller et al. 2017), environmental toxins (Lefebvre et al. 2016), and large-scale regime shifts that affect prey distribution and abundance (Jemison and Kelly 2001; Trites et al. 2007b). Climate change is also likely to affect glacial ice habitat on which many harbor seals depend (Blundell et al. 2011). The effects of the 1989 Exxon Valdez oil spill in Prince William Sound contributed to some mortality, but the magnitude of its impacts has been questioned (Frost et al. 1994; Hoover-Miller et al. 2001). Human disturbance from cruise ships may alter distribution, behavior, and energetic expenditures (Blundell and Pendleton 2015; Jansen et al. 2015; Karpovich et al. 2015; Mathews et al. 2016), but additional studies are required to determine whether these disturbances have population-level effects. At present, the effects of by-catch mortality are unknown (Muto et al. 2019). Harvest rates are low relative to population size (Muto et al. 2019).</p>	
Action Total: -20	

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

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