

Pacific Walrus

Class: Mammalia
Order: Carnivora

Odobenus rosmarus

Note: Only one subspecies, *O. r. divergens*, occurs in Alaska.

Review Status: Peer-reviewed

Version Date: 12 March 2018

Conservation Status

NatureServe:

Agency:

G Rank: G4

ADF&G: Species of Greatest Conservation Need

IUCN: Vulnerable

Audubon AK:

S Rank: S3

USFWS: Strategic Stock

BLM: Sensitive

Final Rank		
Conservation category: II. Red		
high status and either high biological vulnerability or high action need		
Category	Range	Score
Status	-20 to 20	10
Biological	-50 to 50	-16
Action	-40 to 40	-28
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

Historically, population was depleted as a result of large-scale commercial harvests (Fay et al. 1997). Although the population is thought to have rebounded following a reduction in hunting pressure, it has nevertheless experienced drastic changes in population size (Fay et al. 1989; Muto et al. 2017; Taylor et al. 2018). The current trend of Alaska's Pacific walrus population is uncertain; models suggest it is either stable or declining (Taylor et al. 2018). We score this question as $0.5 * B + 0.5 * C$ to take these uncertainties into account.

Distribution Trend in Alaska (-10 to 10)

6

In recent years, the distribution of Pacific walrus has moved north in response to changes in sea ice extent (Jay et al. 2011; MacCracken 2012). However, by mid-century, models predict strong declines in sea ice extent in the Bering Sea and moderate declines in the Chukchi Sea (Garlich-Miller et al. 2011) and these declines are expected to lead to a contraction in its current distribution (MacCracken et al. 2017).

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

Estimated population size is 129,000 individuals (95% CI: 55,000-507,000; Speckman et al. 2011 qtd in Muto et al. 2017).

Range Size in Alaska (-10 to 10) -8

In Alaska, the Pacific walrus is found from the Bering Sea to the Chukchi Sea, and on coastlines and islands from the northeastern Alaska Peninsula north to Point Barrow (Muto et al. 2017). Summer range is most restricted and has an estimated area of ~375,000 sq. km, based on Fig. 1 (page 278) in Muto et al. (2017).

Population Concentration in Alaska (-10 to 10) -6

During the winter breeding season, walruses concentrate around polynyas and open leads in three main areas of the Bering Sea (Garlich-Miller et al. 2011). During summer, most of the population migrates to the Chukchi Sea, though they also congregate near coastal haul-outs in the Bering Strait and Bristol Bay in groups of 10 to >10,000 (as well as the Gulf of Anadyr in Russia; Jay et al. 2012, Fischbach et al. 2016; Muto et al. 2017). Sixty-four on-shore haul-outs on the Alaska coast have been reported to date (Fischbach et al. 2016).

Reproductive Potential in Alaska

Age of First Reproduction (-5 to 5) 1

Females become sexually mature at 5 or 6 years old (Fay 1982).

Number of Young (-5 to 5) 5

Females give birth in alternate years to one calf (Fay 1982).

Ecological Specialization in Alaska

Dietary (-5 to 5) 1

Pacific walrus are primarily benthic feeders (Jay et al. 2012), with a diverse diet consisting of aquatic invertebrates (bivalves, gastropods, cephalopods, marine worms, amphipods), tunicates, and fish (see Fay 1982; Sheffield and Grebmeier 2009). Diet shifts with season, location, and prey availability (Fay 1982).

Habitat (-5 to 5) 1

Associated with sea ice and waters of the continental shelf (Jay et al. 2012; Citta et al. 2018). Foraging sites are typically associated with high prey biomass (Dunton et al. 2005; Grebmeier et al. 2006; but see Jay et al. 2012). Sea ice is an important habitat requirement for walrus, which use ice habitat to bear offspring, molt, and haul out between foraging bouts (Fay 1982; Garlich-Miller et al. 2011). Walrus use terrestrial haul-outs when sea ice is absent (Fischbach et al. 2016; Jay et al. 2012), though use of terrestrial haul-out may be maladaptive (MacCracken et al. 2017). In recent years, walrus have responded by following the northward retreat of sea ice into the Chukchi Sea (Jay et al. 2012). Although sea ice habitats are declining, they are not rare for the time being and walrus are at least somewhat adaptable in their habitat preferences, though there is much left to learn (Garlich-Miller et al. 2011; Jay et al. 2011; Jay et al. 2012).

Biological Total: -16

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 (MMPA; NMFS 2015). The MMPA actively manages and regulates approved harvest activities of Pacific walrus. A conservation plan for the Pacific walrus in Alaska was developed in 1994 (USFWS 1994b).

<i>Knowledge of Distribution and Habitat in Alaska (-10 to 10)</i>	-10
Distribution and habitat association throughout its Alaskan range is well understood (Fay 1982; Garlich-Miller et al. 2011; Fischbach et al. 2009; Jay et al. 2012; Citta et al. 2018). The effects of prey, sea ice, and land on habitat selection have been identified (Beatty et al. 2016).	
<i>Knowledge of Population Trends in Alaska (-10 to 10)</i>	2
To date, survey data are inadequate to identify population trends (Muto et al. 2017). Population monitoring (counts) occur frequently at a portion of haul-out locations throughout Alaska (USFWS 2014b), The USGS Alaska Science Center conducts long-term research on Pacific walrus. Current research includes an age-structure survey to estimate current demographics; walrus seasonal distribution and habitat use; and forecasting responses to climate change (USGS 2016).	
<i>Knowledge of Factors Limiting Populations in Alaska (-10 to 10)</i>	-10
Causes of mortality and drivers of population decline are well-documented, and Pacific walrus are the subject of ongoing studies in Alaska. We refer interested readers to the U.S. Fish and Wildlife Service's Final Species Status Assessment report for comprehensive information on the population ecology of the Pacific walrus (MacCracken et al. 2017). High mortality rates are linked to loss of sea ice resulting in trampling at terrestrial haul-outs, exhaustion from prolonged exposure to open sea conditions, and separation of calves from their mothers (Cooper et al. 2006; Fischbach et al. 2009; MacCracken et al. 2017). Overharvesting is thought to have caused historic declines of walrus populations, but current harvest levels are low (<4% of the population) and compliance with regulations in the U.S. is high (MacCracken et al. 2017). Factors that are not considered to have population-level effects include: viral infections, pathogens, pollutants, toxins from algal blooms, fishery-related mortalities, and industrial activity (Quakenbush et al. 2016; MacCracken et al. 2017; Muto et al. 2017). The effects of climate change are uncertain, though Pacific walrus appear to be currently limited by changing sea ice conditions (Jay et al. 2011; Jay et al. 2012; MacCracken et al. 2017).	
Action Total:	-28

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

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