Ribbon Seal

Histriophoca fasciata

Class: Mammalia

Order: Carnivora

Review Status: Reviewed (Alaska)

Version Date: 14 February 2023

Conservation Status

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

Organization	Rank
NatureServe	G5/S4
ADF&G	Species of Greatest Conservation Need
IUCN	Least Concern
USFWS	Species of Concern

Final Rank

Conservation Category: **III. Orange**

High status and low biological vulnerability and action need

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

Category	Range	Score
Status	-20 to 20	8
Biological	-50 to 50	-20
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)

Historically hunted in large numbers, which at times led to drastic declines in population numbers (Boveng et al. 2013). The population is believed to have rebounded since then. Although current population trends are unavailable, it is unlikely that ribbon seals have faced recent declines i.e., since the turn of the 21st-century (Boveng et al. 2013). Until further information is available, we tentatively rank this question as C- Past declines, now stable.

Score: 2

Distribution Trend in Alaska (-10 to 10)

For the time being, we rank this question as B- Suspected decreasing to maintain consistency with other ice-obligate marine mammals. The Alaska stock of ribbon seals are thought to occupy their entire historically-observed range (Boveng et al. 2013). That being said, because ribbon seals depend on sea ice for part of their life history, their range is likely to be affected by ongoing changes to sea ice extent. The nature of these changes, however, is hard to predict.

Sea ice is likely to persist across much of the ribbon seal's range until the end of the 21st-century; in years where sea ice extent is low, ribbon seals are expected to shift their breeding distribution (Boveng et al. 2013). Changes in ice quality may also impact the amount of available habitat.

Score: 6

Status Total: 8

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)

The best available estimate for the population of the Alaska stock is 184,697 ribbon seals (95% CI: 139,617-240,225), based on data collected in 2012 and 2013 (Muto et al. 2022).

Score: -10

Range Size in Alaska (-10 to 10)

Inhabit waters of the North Pacific Ocean and the Bering Sea north into the Chukchi Sea and the western Beaufort Sea (Muto et al. 2022). Range changes seasonally with changes to the sea ice extent; their range tends to be most restricted when the ice front recedes and some individuals move north of the Bering Strait (Muto et al. 2022). At this time, range size is ~20,000 sq. km, based on range map from ACCS (2017a).

Score: -2

Population Concentration in Alaska (-10 to 10)

Usually solitary. Ribbon seals do not concentrate in large groups, though they can be found in aggregations in spring when seals haul out on ice for nursing and molting (Boveng et al. 2013). Given the loose nature of these aggregations and the stock's population size, we estimate that the number of sites >250.

Score: -10

Reproductive Potential in Alaska

Age of First Reproduction (-5 to 5)

Age of maturation ranges from 1-5 years and depends on foraging conditions (Boveng et al. 2013). Based on data collected between 2003 and 2007, Quakenbush and Citta (2008) estimated an average age of sexual maturation of 3 years old (Quankebush and Citta 2008).

Score: -3

Number of Young (-5 to 5)

Females give birth to a single pup each year (Boveng et al. 2013).

Score: 3

Ecological Specialization in Alaska

Dietary (-5 to 5)

In general, ribbon seals feed on a variety of pelagic and demersal fish, cephalopods, and crustaceans (Boveng et al. 2013). A few species and groups, such as walleye pollock (*Gadus chalcogrammus*), eelpouts (Zoarcidae), and squid, have been reported in several studies (reviewed in Boveng et al. 2013), suggesting a certain degree of dietary specialization. Diet varies based on age, location, and season; very little information exists regarding their diet from July to February. The diet of juveniles, for example, is narrower and includes more invertebrates (Boveng et al. 2013).

Score: 1

Habitat (-5 to 5)

Habitat is tied to specific life history events and changes seasonally. During spring and early summer, ribbon seals are highly associated with sea ice, which they use to haul-out (Boveng et al. 2013). This period corresponds to the time when ribbon seals are rearing pups, breeding, and molting. Meanwhile, from mid-summer through winter, ribbon seals rarely haul out and are mostly not associated with ice (Boveng et al. 2013). Although sea ice extent has seen rapid and dramatic changes in the last few decades, it is thought that there will be sufficient sea ice available in the northern Bering Sea during the crucial period of time from March-April and that ribbon seals will be able to shift their breeding locations in years where sea ice is low (Boveng et al. 2013). For the time being, we rank this question as B- Habitat specialist with key requirements fairly common, though this ranking may change with continued reductions in sea ice.

Score: 1

Biological Total: -20

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 Marine Mammal Protection Act (NMFS 2015). Subsistence harvest is permitted for Native Alaskans and harvest regulations are co-managed by the Ice Seal Committee and NOAA Fisheries (https://www.iceseals.org/).

Score: -10

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

Distribution in the spring, when ribbon seals are tied to sea ice, is well-known and reviewed in Boveng et al. (2013). Less information is available about this species' distribution during the summer, fall, and winter seasons, when ribbon seals become pelagic. Studies using satellite tags have begun to address some of the knowledge gaps, though there is still much to be learned.

Score: 2

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

At present, reliable data on population trends are unavailable (Muto et al. 2022). Aerial counts have been conducted in the past to obtain estimates of population size. Data on subsistence harvest and other human-caused mortality are collected annually (Muto et al. 2022).

Score: 2

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

Hunting was a major factor limiting the population of ribbon seals until the mid-twentieth century. Nowadays, subsistence harvest and other forms of human-caused mortality are unlikely to be major limiting factors. Indeed, recent data suggest that human-caused mortality accounts for fewer than 200 deaths per year (Muto et al. 2022). Other factors influencing survival or reproductive success are largely unknown, though growth rates and age of sexual maturity are likely linked to foraging conditions (Boveng et al. 2013). Available demographic data have been nicely summarized by Quakenbush and Citta (2008) and by Boveng et al. (2013); we encourage interested readers to consult these texts. Given that ribbon seals' life history is closely tied to sea ice, changes in the extent or quality of sea ice over time, as well as changes in the distribution or abundance of their prey base and their predators, will likely lead to concomitant changes in the distribution or population of ribbon seals. The nature of these changes, however, is hard to predict and remains an important 'unknown' in assessing the future health and persistence of this species.

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: 50-74%

Peripheral: No

References

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