



(photo credit: NMFS)

KEY INFORMATION

Area(s) of Concern

Rangewide; Sea of Okhotsk, Bering and Chukchi Seas.

Year Identified as “Species of Concern”
2008

Factors for Possible Decline

- Climate change and loss of sea ice
- Ocean acidification
- Overharvest

Conservation Designations

IUCN: Data Deficient

Species of Greatest Conservation Need: AK

Brief Species Description:

The ribbon seal is a member of the phocid seal family with a strikingly-marked “ribbon” or banding pattern of black, gray, and white (see photo). Females have less contrast in their color patterns. Adults reach 59 to 69 inches (150 – 175 cm) in length and 150 to 200 lbs (70-90 kg) in weight. They primarily inhabit the Arctic areas of the Sea of Okhotsk, and Bering and Chukchi Seas (Figure 1).

This species is strongly associated with the sea ice during its whelping (birthing), mating, and pelage molt periods, from mid-March through June. Ribbon seals have an apparent affinity for stable, clean, moderate-sized ice floes that are slightly, but not deeply interior to the pack ice edge (Boveng et al. 2008). Most of the rest of the year is spent at sea; the species is rarely observed on land. Ribbon seals feed pelagically in deep waters on a variety of cephalopods and fishes including walleye pollock, cod, flatfishes, and eelpouts. Young ribbon seals eat mostly crustaceans including euphausiids, mysids, and shrimps.

Rates of survival and reproduction are not well known, but ribbon seals can live 20 to 30 years. They reach sexual maturity at 1 to 5 years of age, probably depending on environmental conditions. There are two main breeding areas: one in the Sea of Okhotsk and one in the Bering Sea. Adult females usually give birth every year to a single pup which is nursed for 3 to 4 weeks and then abandoned to fend for itself (Boveng et al. 2008). Young are born with a white coat that is molted after 3 to 5 weeks (Figure 2). Newborn pups are about 34 inches (86 cm) long and weigh 21 lbs (9.5 kg). The ribbon pattern gradually develops over the following 3 years. On average, adults lose 20 to 30% of their weight and 50 to 60% of their blubber thickness during the spring whelping, breeding, and molting season.

Rationale for “Species of Concern” listing:

Demographic and Genetic Diversity Concerns:

With a range-wide population likely comprising at least 200,000 individuals, ribbon seals are not currently at risk from the demographic issues of low abundance, such as demographic stochasticity, inbreeding, loss of genetic diversity, or compensatory effects (Boveng et al. 2008). The current population trend is unknown, but a recent estimate of 49,000 ribbon seals in the eastern and central

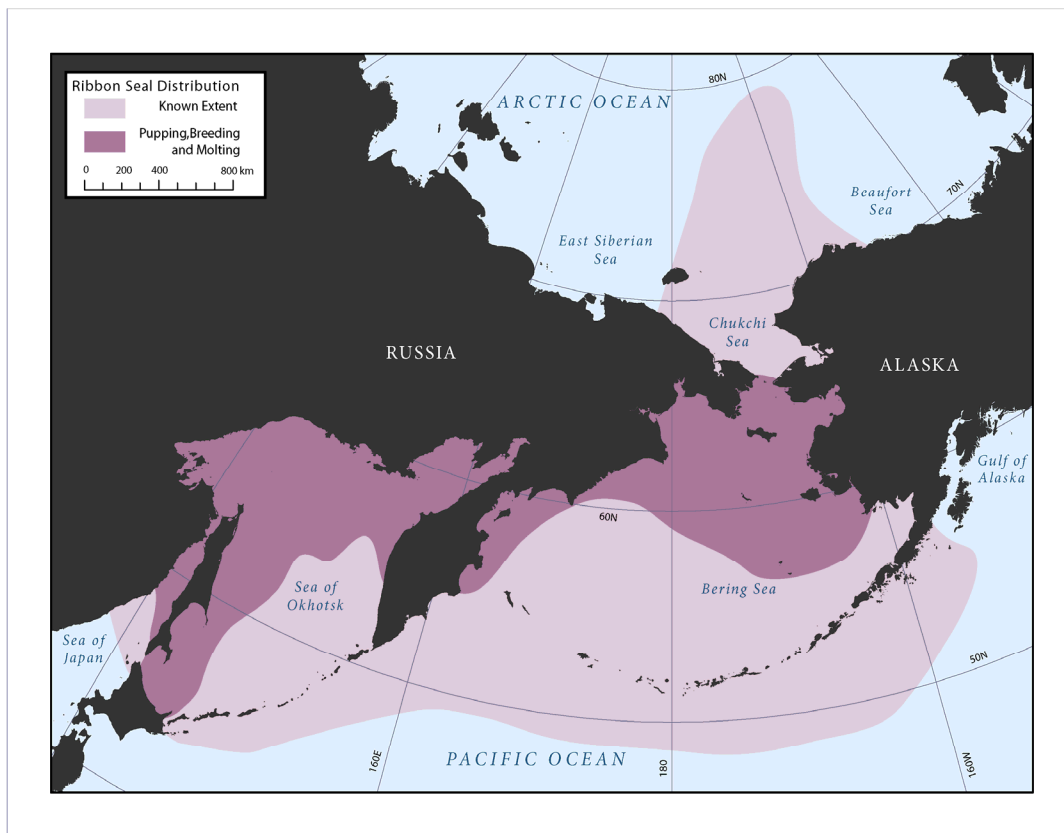


Figure 1: The geographic distribution of ribbon seals, based on documented observations and satellite telemetry. National Marine Mammal Lab.

Bering Sea is consistent enough with historical estimates to suggest that no major or catastrophic change has occurred in recent decades. The species is thought to occupy its entire historically observed range. There are no portions of their range in which ribbon seals have been reported to have disappeared or been extirpated, nor are they known to be demographically at risk in any portion of their range. Population genetic data are lacking and there is no evidence to suggest discrete populations based on breeding area.

Factors for Decline:

The main concerns about the conservation status of the ribbon seal stem from the likelihood that its sea ice habitat has been modified by the warming climate and that the scientific consensus projections are for continued warming into the foreseeable future. There could be impacts on ribbon seal survival and recruitment from more frequent years of reduced ice thickness and duration. Decreased availability of stable ice for adults to complete their molt out of the water may lower survival, but it is not currently possible to quantify this impact or the extent to which ribbon seals may adapt by shifting locations for key life history events of breeding and molting. Whelping, nursing of pups, and maturation of weaned pups could also conceivably be impacted in years when the ice does not extend as far south as it has typically in the past, because the breeding areas would be farther from the continental shelf break, a zone that seems to be a preferred foraging area during spring. If



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these conditions occur more frequently, as is anticipated from projections of future climate and sea ice conditions, reproduction and survival of young could be impacted.

Ocean acidification, a result of increased carbon dioxide in the atmosphere, may impact ribbon seal survival and recruitment through disruption of trophic regimes that are dependent on calcifying organisms. However, the nature and timing of such impacts are extremely uncertain. Changes in ribbon seal prey, anticipated in response to ocean warming and loss of sea ice, have the potential for negative impacts, but the possibilities are complex. However, flexibility in ribbon seal foraging locations and habits may make these threats of lower concern than more direct impacts from changes in sea ice.

Past commercial harvests by Russian sealers have at times been high enough to cause significant reductions in ribbon seal abundance and catch-per-unit-effort. Although Russian government quotas were recently put in place that would allow large harvests (~18,000 annually), the actual takes are low because of poor economic viability. There is some effort in Russia to develop new uses and markets for seal products, but unless these are successful, the harvest is unlikely to increase in the near future. Small subsistence harvests also occur in Russia and Alaska.

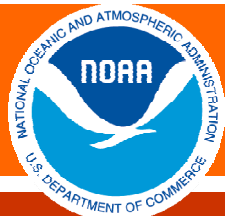
Status Reviews/Research Underway:

On December 20, 2007, the Center for Biological Diversity petitioned NMFS to list the ribbon seal as a threatened or endangered species under the Endangered Species Act (ESA), primarily due to concern about threats to its habitat from climate warming and loss of sea ice. After reviewing the petition, we found that it presented substantial information indicating that the petitioned action may be warranted (73 Federal Register 16617, March 28, 2008). At that time, we commenced a status review of the ribbon seal. The status review is a compilation of the best available information concerning the status of ribbon seals, including the past, present, and future threats to this species, as well as conservation efforts undertaken by states and foreign nations to protect them. NMFS completed the [Status Review](#) of the Ribbon Seal in December 2008 (Boveng et al., 2008), and determined that the species is not in danger of extinction throughout all or a significant portion of its range, nor is it likely to become so in the foreseeable future. Because of the uncertainties regarding the effects of climate change, sea ice cover, and potential Russian harvests on ribbon seals, we add the ribbon seal to our Species of Concern list.

Our National Marine Mammal Lab is engaged in an active research program for ribbon seals. Information from that research will be used to enhance our understanding of the risk factors affecting ribbon seals, thereby improving our ability to develop effective management measures for the species. We will continue to monitor the status of the ribbon seal. Aerial surveys were conducted in portions of the eastern Bering Sea by the National



Figure 2. Adult and young. Photo credit: NMFS.



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Marine Mammal Laboratory (NMML) in 2003, 2007, and 2008. The data from these surveys are currently being analyzed to construct estimates of abundance for the eastern Bering Sea from frequencies of sightings, ice distribution, and the timings of seal haul-out behavior.

The program recently funded a project to characterize the presence of algal toxins in ribbon and other ice seals and to assess the potential impact of climate change on algal toxin exposure. As resources permit, we will conduct further studies of ribbon seal abundance and status. If conditions change in the future, we will re-evaluate the status of this species to determine whether it should be listed as threatened or endangered under the ESA.

Data Deficiencies:

Genetic studies are needed to understand population structure. Range-wide surveys will improve the timeliness and precision of abundance estimates. Spatial data on movements and habitat use, for both the ice-associated and pelagic periods of the ribbon seals' annual cycle, will help management and conservation actions. Analysis of demographic data obtained from the former Soviet commercial harvest will help further refine population estimates and targets and life history understanding.

Existing Protections and Conservation Actions:

In U.S. waters, ribbon seals are protected by the Marine Mammal Protection Act (MMPA). The goal of the MMPA is to protect and conserve marine mammals so that they continue to be significant functioning elements of the ecosystem of which they are a part. NMFS also co-manages ribbon seals with the Ice Seal Committee (ISC), which is an Alaska Native Organization dedicated to conserving seal populations, habitat, and hunting in order to help preserve native cultures and traditions. The ISC co-manages ice seals with NMFS by monitoring subsistence harvest and cooperating on needed research and education programs pertaining to ice seals.

For More Information:

- [NMFS National Marine Mammal Laboratory Ribbon Seal Information and Research](#)
- [Alaska Department of Fish and Game Ribbon Seal Wildlife Notebook Series](#)
- [Alaska Sea Grant Marine Mammals of Alaska Field Guide: Ribbon Seal Information](#)
- [Seal Conservation Society Ribbon Seal Species Information](#)
- [International Union for the Conservation of Nature and Natural Resources \(IUCN\) Ribbon Seal Species Information](#)

References:

Boveng, P. et al. 2008. Status review of the ribbon seal (*Histiophoca fasciata*). NOAA Tech. Memo. NMFS-AFSC-191. <http://alaskafisheries.noaa.gov/protectedresources/seals/ice/ribbon/statusreview08.pdf>

Point(s) of contact for questions or further information:

For further information on this Species of Concern, or on the Species of Concern Program in general, please contact NMFS, Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910, (301) 713-1401, soc.list@noaa.gov; or Brad Smith, National Marine Fisheries Service, Alaska Region, Protected Resources Division, 222 W. 7th Avenue, Box 43, Anchorage, AK 99517, (907) 271-3023, Brad.Smith@noaa.gov.