

Ribbon Seal

Ribbon seals, *Phoca fasciata* are also referred to as *Histiophoca fasciata* due to a taxonomic debate about how closely ribbon seals are related to harbor, spotted, and ringed seals. Ribbon seals are the rarest and most elusive of the ice seals and in waters adjacent to Alaska they occur mainly in the Bering Sea where they are found in the open sea in summer and in the pack ice in winter. The term ice seal refers to four seal species in Alaska that depend upon ice for feeding, resting, and pupping. Alaskan Eskimos refer to ribbon seals as *qasruliq* in central Yup'ik, *qasrleq* in Nunivak Island Cup'iq, *kukupak* in St. Lawrence Island Yup'ik, and *qaiqulik* in northern Inupiaq.

General Description: Ribbon seals belong to a group known as pinnipeds, which includes seals, sea lions, and walruses. Seals cannot walk on their hind legs and they do not have external ears. Ribbon seals are larger than ringed seals and smaller than bearded seals and average 5.5 ft long and 175 lbs. The adult markings include four, nearly white, bands or ribbons on a dark background. One band each encircles the neck, the posterior trunk, and each foreflipper. The widths of the bands are variable, and on some seals they even fuse together. Although the pattern is similar on males and females, the background on males is much darker creating greater contrast and the more striking appearance of the males. Ribbon seals can also be recognized by their relatively short snout, long neck, slender trunk and large black eyes. They have 34 small, weakly rooted teeth.



Ribbon seals have a unique air sac structure not found in other seals. The trachea or windpipe is connected to an air sac which lies outside the ribs on the right side of the body and is present in both sexes, although it is considerably more developed in males. Its function is unknown, but it may be involved in sound production or act as a buoyancy device during diving or for floating at the surface. Ribbon seals have other special features that are probably related to deep diving such as proportionally heavier internal organs and the highest red blood cell count, blood volume, and hemoglobin content of all seals.

Food Habits: Ribbon seals eat a variety of crustaceans (e.g., shrimps, mysids, crabs) and cephalopods (mostly squid), but their main prey is fish. Fish species include walleye pollock, arctic and saffron cod, eelpout, capelin, Greenland halibut, pricklebacks, herring and sandlance.

Life History: Ribbon seals reach sexual maturity at an earlier age than other ice seals with females maturing at 2–4 years and males at 3–6 years. Pups are born on the pack ice between April and mid-May. Pups are born in lanugo, which keeps them warm as long as they remain dry. Snow drifts, ice ridges, and their mother are the only protection from the harsh weather. Pups nurse for 3–4 weeks when pup weight more than doubles. Once they are weaned the pups must learn to dive and feed on their own. During this time pups may lose half of the weight they acquired during suckling. The blubber reserves accumulated during the nursing period are critically important to the survival of pups during the first year after weaning.

Newborn pups are almost 3 ft long from nose to tail not including hind flippers and weigh about 13 to 22 pounds (6–10 kg). Ribbon seals are born with a natal coat of soft, white hair called lanugo, which provides insulation in air. The lanugo is shed after a thick layer of blubber develops, usually when pups are about 5 weeks old. This new coat is blue to black on the back and silver to gray on the belly with no ribbon markings. The ribbons will gradually appear over the next four years becoming more pronounced with each annual molt.

Pupping, suckling, and mating occur on the seasonal sea ice within a period of a few months. The active gestation period, however for a ribbon seal is only 8.5 months. A 2.5 month delay in the implantation of the fertilized embryo corrects the timing so that the pups are born the next spring. Delayed implantation is a common adaptation for pinnipeds. Most ribbon seal females become pregnant every year. Ribbon seals live to be 20–25 years old; the oldest recorded ribbon seal was 26 years old.

Seasonal movements: Ribbon seals are unable to maintain a breathing hole through more than 4 to 6 inches (10–15 cm) of sea ice and thus are found mainly in ice that is unconsolidated where they can surface to breathe between ice floes. They are found in highest concentrations along the front of the Bering Sea ice pack during late winter and spring. In May and June, the ice front moves north carrying the ribbon seals with it. In some years ribbon seals follow the ice into the northern Chukchi Sea. In summer, when the ice is gone they live a pelagic life in the open sea. Little is known of their life during this time as they are rarely seen. The majority of ribbon seals probably remain in the Bering Sea during this open water period. Incidental sightings have occurred in the western Beaufort Sea and along the southern coast of California. The National Marine Mammal Laboratory put satellite transmitters on ribbon seals captured in the Russian Bering Sea along the coast of the Kamchatka Peninsula in 2005. Most of the seals stayed in the central to eastern Bering Sea and one traveled along the south side of the Aleutian chain. Ribbon seals tagged near St. Lawrence Island in 2006 traveled into the Chukchi Sea suggesting that the seals originating near Russia may have more southerly general movements than seals found near St. Lawrence Island.

Behavior: Ribbon seals are not afraid of passing boats or humans. When they haul out on ice they lay far from the ice edge making a fast retreat difficult, mothers will also leave pups alone on the ice for extended periods. This lack of concern seems to indicate that predators such as foxes and polar bears are rare in the broken ice pack where they haul out. Ribbon seals are usually solitary animals with congregations occurring loosely around favorable areas. Ribbon seals move across ice in a way distinct from other ice seals. Most ice seals inch-worm forward, pulling with both forelimbs at the same time and dragging their hind limbs along to move on the ice. Ribbon seals alternate pulling with one forelimb at a time and move their hind end side to side in a more snake-like manner.

Population size: Population estimates are extremely difficult to attain for ice seals due to the remoteness of their habitats and the amount of time they spend in the water where they cannot be seen to be counted. There is a commercial harvest of ribbon seals in Russia and from 1961 to 1967 it is thought that a harvest of ~13,000 animals per year resulted in significant population declines. The annual harvest was reduced to 3,000 seals in 1969 and since then the population was thought to have returned to pre-exploitation levels. In 1981, an aerial survey of the Bering Sea resulted in a population estimate of 90,000 to 100,000; however such surveys contain some significant unknowns such as the number of seals in the water at the time of the survey. No current population assessments are available for ribbon seals but they are not currently listed as 'threatened' or 'endangered' under the Endangered Species Act, nor are they listed as 'depleted' under the Marine Mammal Protection Act.

Predators, hunting, and other mortality: Potential predators include polar bears, killer whales, eagles, and gulls. The extent of the mortality caused by these predators is not well known. Subsistence hunters in Alaska take less than 200 ribbon seals annually; this is far fewer than any other ice seal species, in part because ribbon seal distribution does not make them available to Alaskan coastal villages. Ribbon seals have been found traveling over ice for long distances due to sudden freeze-ups and seals may sustain injuries during these events that lead to death. Ribbon seals are incidentally taken in groundfish trawls and salmon gill nets but apparently not in large numbers. The incidental catch from Bering Sea/Aleutian Islands pollock trawl fishery and the Bering Sea/Aleutian Islands Pacific cod longline

fishery from 2000 through 2004 reported the annual mortality rate to be less than one seal per year. There is concern that climate change may negatively affect populations of ribbon seals by sea ice melting before pups are weaned.

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