

New Conservation Efforts Begin for Alaska's Steller Sea Lions

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The once plentiful Steller sea lion is now listed as a threatened species under the U.S. Endangered Species Act. Indications are that the population has declined by over 60 percent in just four years. In this article, we present a summary of the current status and history of the observed decline, as well as a summary of possible causes for the decline.

INTRODUCTION

Steller sea lions (also known as northern sea lions) range throughout the North Pacific rim from the Channel Islands off southern California, northward to Bering Strait, and westward to Japan and Korea. Alaska, where George Wilhelm Steller discovered the species in 1742, is home to most of the world's population.

Sea lions are an important and conspicuous component of Alaska's marine mammal fauna. Their distinctive appearance and entertaining behavior make them popular subjects for wildlife watching when they are hauled out on buoys and near boat harbors, or are swimming or feeding near boats or along the shore. They are an important subsistence resource for Alaska Natives in coastal villages who hunt them for food and use the skins for making a variety of products. Commercial fishermen often see and interact with sea lions in the course of their daily

fishing activities.

Steller sea lions are highly gregarious and use the same sites each year to give birth and to haul out and rest. Haulout sites where breeding occurs are called rookeries. Most of the haulout and rookery sites are on remote and exposed rocks and islands. Mature males, which are two to three times larger than females, defend territories during the pupping and mating season, which lasts from late May through early July. Breeding males remain on their territories during the reproductive season. They do not eat or go out to sea at all. Adult females give birth to single pups annually between mid-May and mid-July. A few days after giving birth, females begin alternating feeding trips at sea with periods on land nursing their pups. Pups begin to enter the water at about two weeks of age and are proficient swimmers by the time they are about six weeks old. Pups usually maintain a bond with their mother until the next breeding season and may nurse up to three years old.

Sea lions often feed in groups which consist of fewer than 50 individuals, although larger groups have been seen. Feeding is thought to occur mainly in the evening and at night. Groups of feeding sea lions are often seen in areas where commercial fisheries are operating, but there is no comprehensive understanding of the importance of different areas for feeding. Prey of sea lions include pollock, herring, cod, salmon,



Photos by National Marine Fisheries Service

Ugamak Bay, Ugamak Island in the eastern Aleutian Islands, showing the progressive change in numbers of Steller sea lions hauled out on land during the breeding season on 10 June 1967, 27 June 1977, and 22 June 1986 (photos left to right).

smelt, sculpins, flatfishes, squids, octopus, and sometimes seal pups. Pollock seems to be a particularly important food in the north Gulf of Alaska and the Bering Sea.

Rookeries are known to occur on 29 islands and rocks in the Bering Sea, Aleutian Islands, and Gulf of Alaska, and two in southeastern Alaska. In 1989 there were five rookeries that had over 1,000 animals. The largest number was at Forrester Island, southeast Alaska, where 4,648 animals were counted. Most of the pups are produced at the same few large rookeries each year. The waters immediately adjacent to rookeries are also important sea lion habitat. Adult sea lions must transit these areas daily as they go out to sea to feed, and pups use nearshore areas as they learn to swim and forage.

Virtually all rookeries are used as haulouts by subadult sea lions and by adult animals at times of year other than the pupping and breeding season. In addition to the rookeries there are at least 100 areas used as haulouts in the Gulf of Alaska, and probably 250 or more throughout Alaska as a whole. It is likely that haulouts provide sea lions with places free from

disturbance where they can rest in close proximity to food resources.

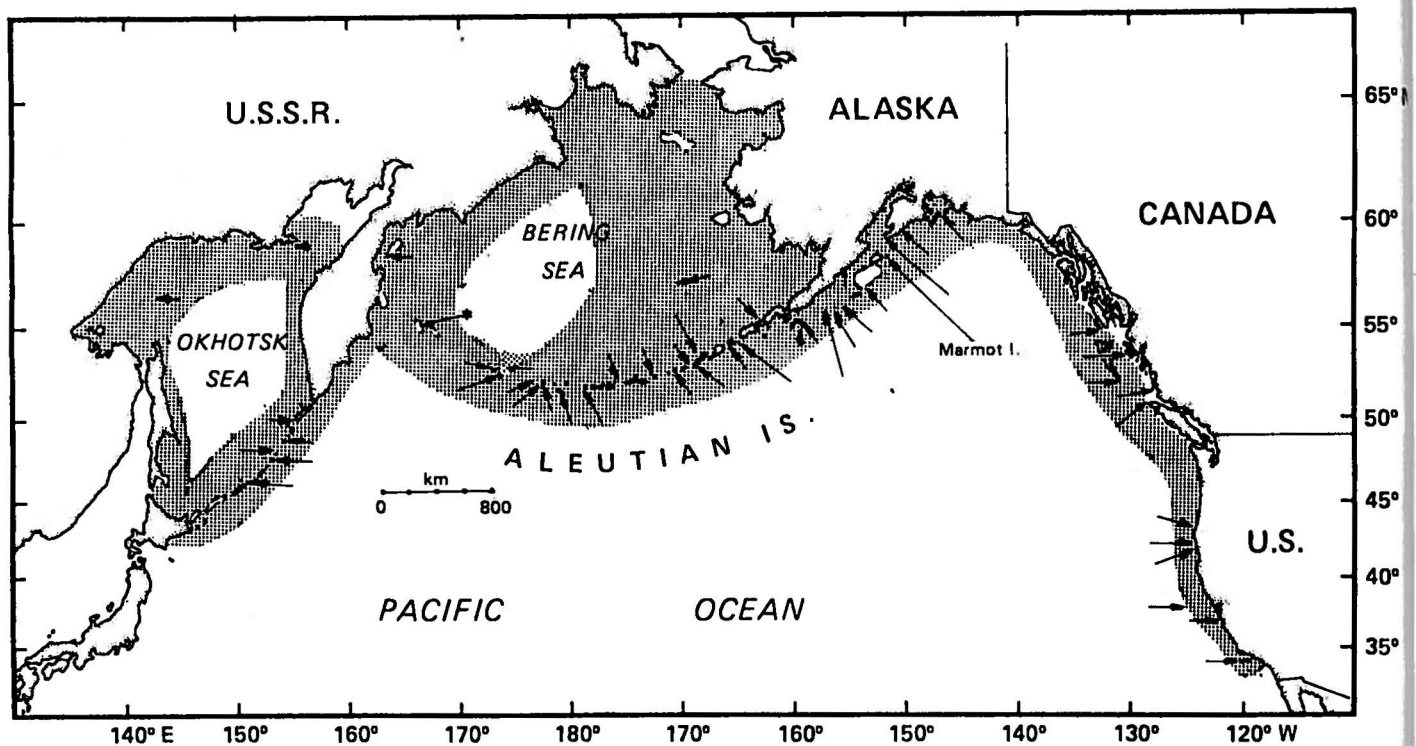
CURRENT POPULATION STATUS

Although sea lions haul out in predictable locations and are relatively easy to count, there is always some uncertainty in population estimates because some animals are at sea. Historically, about 85 percent of the world's Steller sea lion population has occurred in Alaskan waters, mostly in the Gulf of Alaska and Aleutian Islands. In the late 1960s scientists estimated that there was a minimum of 140,000 sea lions in the area from

Kenai Peninsula to Kiska Island. The number of animals counted in this region declined greatly over the next 30 years. In southeastern Alaska and areas to the south (except California where they have declined), the numbers of sea lions have remained stable. However, in the western Aleutians, Pribilof Islands, and Kuril Islands (in the U.S.S.R.) numbers have also declined.

The greatest decline has been in the eastern Aleutians where sea lion counts dropped 94 percent from about 50,000 animals

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Current range of the sea lion. Important rookeries are indicated by arrows.

in the late 1960s to about 3,000 in 1989. Declines in other regions were 72 percent in the central Aleutians, 82 percent in the western Gulf of Alaska, and 73 percent in the central Gulf. The overall decline of counts has been 82 percent from the late 1950s to 1989. The drop from 1985 to 1989 was 63 percent. Counts of juveniles and adults on rookeries and haulouts are variable because there are always some animals at sea at the time surveys are flown. The surveys are made at about midday during June/July when maximum numbers are on land. Thus the counts represent a minimum number of animals at the site and are a representation of the trend in abundance, not estimates of the total population size. Counts of pups are more difficult to obtain, but they provide a reliable index of population status and productivity. The number of pups produced on Marmot Island has declined from over 6,000 in 1978 and 1979 to about 3,000 in 1987 and 1988, and 2,200 in 1989. At Atkins Island (western Gulf of Alaska) the pup count dropped from 4,538 in 1979 to 1,046 in 1986. At Seguam Island (central Aleutians) the pup count declined from 2,475 in 1979 to 529 in 1989.

WHAT CAUSED THE DECLINE?

The Steller sea lion population in the Gulf of Alaska and Aleutian Islands has decreased markedly over the past 30 years. Unfortunately, we do not fully understand the influence that various natural and human-related factors have had on sea lion population biology. A variety of possible causes has been suggested, including environmental changes, subsistence and commercial harvests, increases in natural predators, diseases, toxic substances, entanglement in debris, and fishery-related effects. Fishery-related factors include intentional shooting of animals, incidental (unintentional) killing of animals entangled in fishing gear, and changes in prey availability due to commercial harvesting.

The available data are inadequate to fully explain what caused the sea lion decline, in part because the circumstances and factors now affecting the population may be different from what existed 30 years ago, and they may be different in different areas. Nonetheless, scientists and resource managers are expected to evaluate and interpret the available information in an attempt to assess what has been going on.

Considering how many sea lions there were in Alaska in the 1950s it seems unlikely that harvests by humans, changes in natural predators, or entanglement in debris could have caused such a drastic decline, if the earlier population was healthy and productive. Sea lions are known to carry certain diseases that might have influenced rates of productivity and mortality (leptospirosis, San Miguel sea lion virus, and chlamydia have been identified), but it is not known if they have had any significant impacts. Contaminant burdens and their possible effects are unknown but are presumed to be insignificant.

The possible influence of changes in environmental conditions is difficult to evaluate. In general, world pinniped (seal and sea lion) populations have been growing since the cessation of directed commercial harvests. However, populations have not been tracked for long enough to know what kind of fluctuation or stability can be expected in the absence of human interference. Major environmental changes such as naturally occurring El Niño warm water events have caused reductions in growth rates and pup production. The fact that Pribilof Island fur seals, harbor seals, and Steller sea lions have all declined in the Gulf of Alaska and Bering Sea suggests that some widespread factor may be influencing pinniped populations in these areas. However, data collected on northern fur seals in the Bering Sea suggest that the 1982-83 El Niño event did not have an effect on this species' population growth.

It is certain that commercial fishing activities have resulted in some Steller sea lion mortalities, but the total number can-

not be estimated. Under the Marine Mammal Protection Act (MMPA) of 1972 fishermen could kill sea lions if they were causing destruction to gear or caught fish and could not be deterred by other means. Such intentional taking has now been prohibited by amendments to the MMPA in 1988. The number of nuisance animals that were shot in past years is unknown, but it is likely that the number currently being killed has been greatly reduced.

The number of sea lions taken incidentally in foreign and joint venture trawl fisheries in Alaska has been documented by observer programs. In 1978-81, the estimated take by all foreign vessels was 724 per year. In 1982, over 1,000 sea lions were taken by U.S. trawlers working in the joint venture fishery in Shelikof Strait. The number taken decreased to less than 400 per season in 1983-84 and decreased further in the following years with changes in fishing techniques and effort. Virtually all groundfish fishing is now done by domestic fishermen who have only recently been covered by an observer program. Recent observations of the domestic trawl fishery in Alaska has shown the incidental take of sea lions to be very small.

At least in the Gulf of Alaska, it appears that a large portion of the diet of Steller sea lions consists of commercially harvested fishes, especially pollock. Most of the pollock eaten by sea lions are relatively large and are similar in size to those caught commercially. A comparison of biological parameters of sea lions near Kodiak found that in 1985-86 animals were smaller, and had lower blood values and reproductive rates, than in 1975-78. This suggests that during the 1980s sea lions in the central Gulf of Alaska may have been under nutritional stress. Over that period of time a major commercial fishery developed that targeted on dense schools of spawning pollock in Shelikof Strait. The size of that pollock stock decreased markedly, apparently mostly due to a series of years of poor recruitment.

ACTIONS TO PROTECT SEA LIONS

Because surveys in 1985 showed that the population had declined to less than 50 percent of its historical size, the National Marine Fisheries Service (NMFS) published a notice in May 1988 indicating an intent to list Steller sea lions as "depleted" under terms of the MMPA. The proposed listing was of great concern because provisions of the MMPA at that time totally prohibited the incidental taking of "depleted species" in commercial fisheries. Amendments to the MMPA in 1988 provided an interim solution to the problem of the incidental taking of sea lions in fisheries by specifically allowing the take of up to 1,350 animals per year. The amendments also prohibited the intentional shooting of Steller sea lions and directed NMFS to develop a conservation plan for the species by December 31, 1990.

Range-wide surveys of Steller sea lions conducted in 1989 confirmed that the decline had continued and that the population in the Gulf of Alaska and Aleutian Islands was greatly reduced from historic levels. In October 1989 NMFS released an updated status review and began considering an emergency listing of the species under the Endangered Species Act (ESA).

In November 1989 the Environmental Defense Fund petitioned the Secretary of Commerce to make an emergency listing of sea lions in Alaska as endangered. Listing of a species under the ESA allows federal agencies to take a wide range of actions that they deem necessary to ensure recovery of the population (see box). A notice implementing an emergency listing of Steller sea lions as threatened was published in the Federal Register on April 5, 1990 (see box). The NMFS, now taking public comments on this action, will develop a permanent rule based on the input received.

CONSERVATION MEASURES FOR SEA LIONS

The purpose of listing a species under the ESA is to promote the actions required to allow the population to recover. To accomplish that, conservation measures need to be developed and implemented to stop the decline, encourage population growth, and ensure that important habitats are protected. Some preliminary actions have been described in the emergency listing, and others will be developed in the near future. In general, conservation measures will fall into the categories of reducing mortality, enhancing productivity, and protecting habitat.

Since passage of the MMPA in 1972 it has been illegal for anyone other than Alaska Natives and fishermen to shoot sea lions. Harvest by Alaska Natives is small and limited to what is needed for subsistence. The ESA contains provisions that allow for continued subsistence harvests. Amendments to the MMPA in 1988 made it illegal for fishermen to shoot sea lions, and that prohibition is reinforced by a listing under the ESA.

The number of sea lions being taken incidentally in various fisheries will be documented through a new observer program. If significant numbers of sea lions are being taken in some fisheries or areas it may be necessary to take steps to reduce the level of take. Fishermen need to be aware of the need to minimize incidental taking of sea lions and should be encouraged to come up with suggestions as to fishing methods that catch the fewest animals.

If Alaska's sea lion population is to recover, it is critical that important habitats are protected from disturbance or destruction. Most sea lion haulouts and rookeries are included in the Alaska Maritime National Wildlife Refuge and therefore should be adequately protected. One of the largest sea lion rookeries in Alaska is on Marmot Island, which is state-owned land. There is an urgent need to protect the Marmot Island rookery by designating it as a critical wildlife habitat. Use of state waters surrounding major rookeries also needs to be regulated.

To repopulate the sea lion range in Alaska it will be necessary to have a productive population. Food availability is one factor that may limit pinniped populations, and there are indications that sea lions in Alaska have been nutritionally stressed. For the population to be productive, sea lions will need to be able to find an ample supply of food. Regulation of commercial fisheries may be necessary to ensure adequate food is available, especially at critical times and areas.

The decline in Steller sea lion abundance and the associated
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Steller Sea Lion

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THE ENDANGERED SPECIES ACT

The Endangered Species Act (ESA), passed by Congress in 1973 and most recently amended in 1988, is a comprehensive and powerful piece of environmental protection legislation. Its stated purposes are "to provide a means whereby the ecosystems upon which endangered species and threatened species may be conserved" and "to provide a program for the conservation of such endangered species and threatened species."

Any species of wildlife or plant may be eligible for listing under provisions of the ESA. A species may be listed as endangered if it is "in danger of extinction throughout all or a significant portion of its range," or as threatened if it "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

Normally, species are listed under the ESA after careful review of population status, public notice of the proposed action, and opportunity for public comment. The process may be initiated within the responsible management agency, or by a petition submitted by any interested party. The ESA also allows agencies to make emergency listings if there is an emergency that poses a significant risk to a population. Emergency listings do not require public notice and comment and are effective for 240 days.

When a species is listed as threatened or endangered, the responsible management agency may issue whatever regulations it deems necessary to ensure adequate protection. Any federal agency that intends to conduct an activity that might affect a listed species must first consult with the management agency to determine what impacts there may be and how to mitigate them. States must comply with the federal conservation plan and may also pass more stringent regulations. The ESA requires the identification and protection of critical habitats for listed species.

The ESA also directs the management agency to develop and implement a recovery plan for endangered or threatened species which provides for recovery of that species until it no longer requires ESA protection.

problems in Alaska are very serious. Based on 1989 surveys, the population is still declining at a rapid rate, and there is no way to predict how low it may get or when the decline will stop. Since the causes of the problem are not well defined, it is going to be very difficult to design and implement an effective recovery plan. Ongoing and planned research may provide some insights into what is influencing the population and what can be done to reverse the decline and start a recovery. However, the comprehensive ecosystem studies that may be required are

difficult and costly and may not yield simple answers. It is clear that even in the best of circumstances it will take many years for the sea lion population to recover.

The regulations that have been and will be put into place to protect sea lions and their habitats will affect many Alaskans. Wildlife managers and agencies will be struggling to balance the need to ensure recovery of the sea lion population with the need to allow other uses of Alaska's waters and coastline. Open communication and cooperation among all interest groups will be an essential element in the process of dealing with this difficult and perplexing problem.

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NOTICE TO ALL COMMERCIAL FISHERMEN

Regulations applying to all human activities, including commercial fishing, near Steller (northern) sea lions at sea and near some of the islands they breed on have changed.

- (1) Shooting at or near any Steller sea lion for any reason is now prohibited in U.S. waters. Fishermen may still use other means which do not result in injury or death to the animal to deter sea lions from interfering with their gear.
- (2) Subject to certain limited exceptions, operating vessels within three miles of any Steller sea lion rookery (locations where pups are born) west of 150° W longitude is now prohibited. Detailed maps or additional clarification are available from the National Marine Fisheries Service in Juneau.
- (3) The Secretary of Commerce is now empowered to place observers on any fishing vessel in order to monitor the accidental capture of sea lions in fishing gear. No more than 675 sea lions may be killed accidentally during fishing operations west of 141° W longitude.
- (4) Violations of laws protecting Steller sea lions are subject to severe civil and criminal penalties including vessel forfeiture, fines of up to \$25,000, and imprisonment for up to one year for each violation.

FOR MORE INFORMATION CONTACT:

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