

THE SUBSISTENCE HARVEST AND USE
OF STELLER SEA LIONS IN ALASKA

by

Terry L Haynes and Craig Mishler

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ABSTRACT

Subsequent to the classification of the Steller sea lion as a threatened species in 1990, a Sea Lion Recovery Team was created and charged with preparing a population recovery plan. This report examines the historical literature on subsistence uses, reviews Native oral traditions, and summarizes the limited amount of available information on contemporary harvests and uses of sea lions over a wide range of 25 coastal Alaskan communities. The report is designed to assist in creation of a recovery plan sensitive to subsistence uses. Further research and data needs are identified for consideration in the development of a long-range sea lion management plan.

Various strategies of hunting sea lions are described, along with hunting technologies, methods of butchering sea lions, and traditional ways of cooking and serving them. Evidence gathered from prehistoric sites is summarized, and the pervasive symbolic role of Steller sea lions in Koniag and Aleut folktales, folk songs, and folk beliefs is examined in some detail.

Judging from recent village harvest surveys, subsistence uses of sea lions appear to have declined rather dramatically in all Kodiak Island villages, although resident Kodiak hunters insist they see more sea lions around the villages than ever before. The number of animals harvested and used in Prince William Sound, Lower Cook Inlet, and the Lower Alaska Peninsula, on the other hand, appears to be fairly stable. Other coastal regions where sea lions are harvested, such as the Aleutian Islands and the Pribilof Islands, have not been studied adequately enough to determine trends.

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INTRODUCTION

For centuries, marine mammals have been important resources in the economies of coastal Alaskan communities extending from the Beaufort Sea in northern Alaska to Dixon Entrance in southeast Alaska. Bowhead whale, seal, and walrus are among the marine mammals most frequently utilized, while sea otter, sea lion, polar bear, and beluga whale are important resources in some communities. Harvest of marine mammals is restricted to Alaska Natives, who were exempted from the moratorium adopted on the taking of marine mammals upon passage of the Marine Mammals Protection Act in 1972 (and amended in 1981). This use can continue as long as the species are not depleted, are used for subsistence purposes, and are harvested in a non-wasteful manner.

On April 5, 1990, due to population declines, sea lions were classified as a threatened species under an emergency ruling (50 CFR Part 227) of the National Marine Fisheries Service (NMFS) under the Endangered Species Act (see the Federal Register, July 20, 1990). This classification was subsequently extended on December 3, 1990. A Steller Sea Lion Recovery Team comprised of representatives from NMFS, Alaska Department of Fish and Game, Pacific State Marine Fisheries Commission, North Pacific Fishery Management Council, Naval Ocean Systems Center, Marine Mammal Commission, university-based biologists, and representatives of the fishing industry was established by NMFS in the spring of 1990 and charged with preparing a recovery plan.

Coinciding with the development of the recovery plan, this report compiles information on the historic harvest and contemporary uses of Steller sea lions (*Eumetopias jubatus*) in selected coastal Alaskan communities. The report examines existing data on the subsistence use of sea lions, identifies topics requiring further research, and makes

recommendations for consideration in the development of a long-range sea lion management plan.

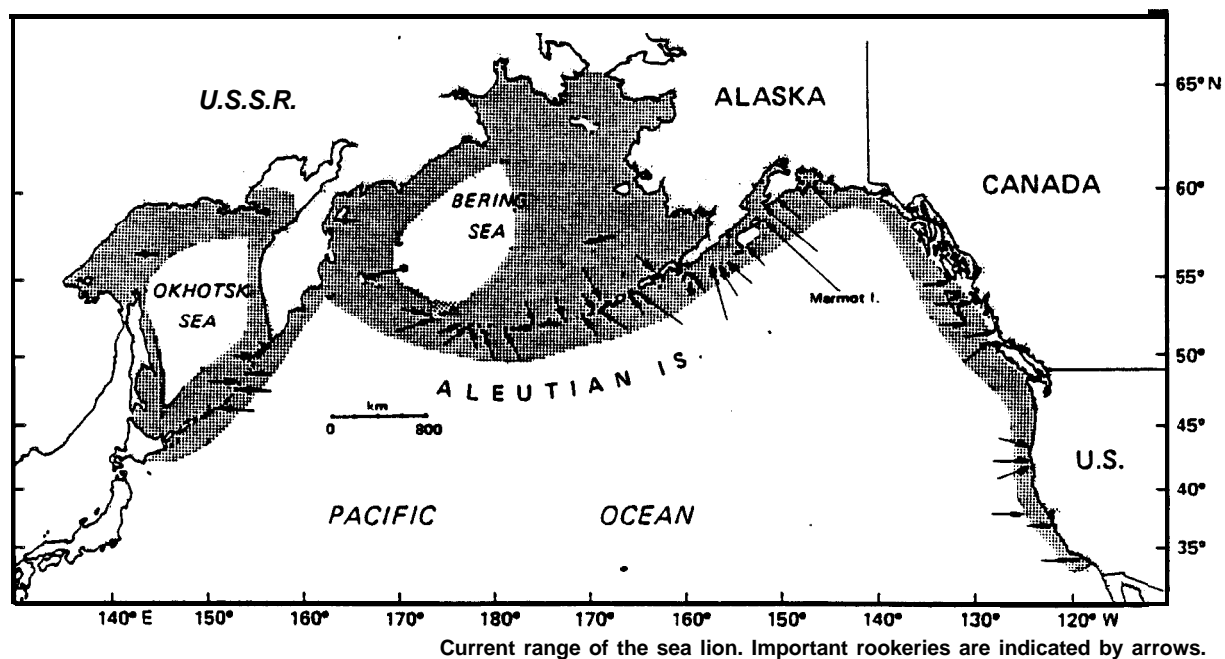
SEA LION POPULATION AND DISTRIBUTION

The Steller (or northern) sea lion inhabits the area from the central California coast to the Bering Sea, the Kamchatka Peninsula in the Soviet Union, the Kurile and Commander Islands, and the western Pacific waters as far south as Hokkaido and Northern Honshu in Japan (see Fig. 1; Calkins 1989). Males of the species attain an average body length of 10 feet, 8 inches (282 cm) and a body weight of 1,245 pounds (566 kg). Adult females average 579 pounds (263 kg) in weight and 8 feet, 8 inches (228 cm) in length. These marine carnivores eat a variety of fish, including pollock, flat fishes, herring, capelin, Pacific cod, salmon, and sculpins, and invertebrates such as squid and octopus (Calkins 1989).

The minimum world population of Steller sea lions in the late 1970s was estimated at about 235,000, with 196,500 of this total occurring in Alaskan waters. Significant population declines have been observed in some areas. In the late 1950s, a minimum of 140,000 sea lions inhabited the area from Kiska Island to the Kenai Peninsula; this number since has steadily declined, from 105,000 in 1976, to 68,000 in 1985, and 25,000 in 1989 and 1990. Numbers also have fallen in the eastern and western Aleutians and in the Pribilof and Kurile islands (Calkins and Goodwin 1988; Alaska Department of Fish and Game 1990).

There are approximately 127 rural communities with a 1985 population of about 67,000 (many of whom are of Alaska Native ancestry) currently living in the ecological range of the sea lion in Alaska. Some of these communities make use of sea lions for subsistence food and raw materials, following long traditions in their area. Other

Figure 1. Distribution of the Steller Sea Lion, *Eumetopias jubatus*
(from Lowry and Loughlin 1990)



communities do not currently harvest sea lions, although they have done so in the past. The following sections describe examples of these traditional subsistence uses.

PREHISTORIC USES

In prehistoric archaeological sites, sea lions appear to replace walrus as a distinct marine mammal species in coastal areas of Alaska dominated by a Pacific maritime climate (Dumond 1977). These areas include the Pacific coast of the Alaska Peninsula, Prince William Sound, the tip of the Kenai Peninsula, the Kodiak Island archipelago, and the Aleutian Islands. A long-term use of Steller sea lions is confirmed in archaeological sites in some of these areas. For example, Aleutian Island sites with sea lion remains date to 3000 years b.p. (Anangula Island) and 4000 years b.p. (Chaluka Village) (Laughlin 1980). Sea lions, often taken with harpoons with bone or ivory heads, appeared to be the principal sea mammal in the latter site, comprising some 10 to 20 percent of all sea mammal bones found.

Unalaska sites dating as early as A.D. 1 to as late as A.D. 1500 have yielded implements and decorative pieces fashioned from sea lion bone. More generally, faunal analyses of sites throughout the Aleutian chain confirm the marine adaptation of its human population and the heavy use of sea lion and other marine mammal species (McCartney 1984).

From four well-preserved sites on southwest Umnak Island in the eastern Aleutians, about 70.4 per cent of the archaeological biomass (meat weight) was represented by sea lions, compared to only 12.2 per cent by hair seals, and three per cent by sea otters (Yesner 1981:156). While such a ratio could be misleading if the bones of certain species were thrown back into the ocean for reconstitution (as is the case among coastal Yup'ik), Yesner observed that the proportion of sea lion faunal remains compared to hair seals and sea

otters in the four sites on southwest Umnak Island is roughly equivalent to their occurrence in the contemporary natural environment (Yesner 1981:156).

On Marmot Island, home of the state's largest Steller sea lion rookery, four archaeological sites (three barabaras and a midden) have been located and recorded on the Alaska Heritage Resource Survey, maintained by the Office of History and Archaeology, Alaska Division of Parks and Outdoor Recreation.

HISTORIC USES

One area with a relatively unique pattern of sea lion use was the Pribilof Islands, about 480 km west of the Alaska mainland in the Bering Sea. To exploit fur seals that bred on the islands in the late 1780s, the Russians transferred Aleuts from the Aleutian chain and established settlements on St. Paul and St. George, two islands of the Pribilof group.

Ivan Veniaminov, the Russian Orthodox missionary (1984; orig. 1840) documented the use of sea lions (*sivuchi*) by Pribilof Islanders in the 1830s. He reported the principal harvest occurring on St. George Island, where an average of 2,000 was taken annually. At that time, sea lions were hunted by driving them inland from the shore and killing them with sticks and spears. In the Pribilofs, firearms were occasionally used but were less reliable, as the bullet reportedly could not always penetrate the animals' thick skulls. Sea lions were also speared by Koniag hunters during the mid-19th century, although apparently the animals were only rarely seen along the Kodiak coastline at that time. The hides of sea lions nevertheless had considerable ceremonial importance, since they were used to wrap the Koniag dead before burial (Holmberg, 1985:51,53).

Henry W. Elliott (1881, 1887) described Pribilof sea lion hunting and herding, butchering techniques, uses for sea lion parts, and annual harvest levels during the 1870s.

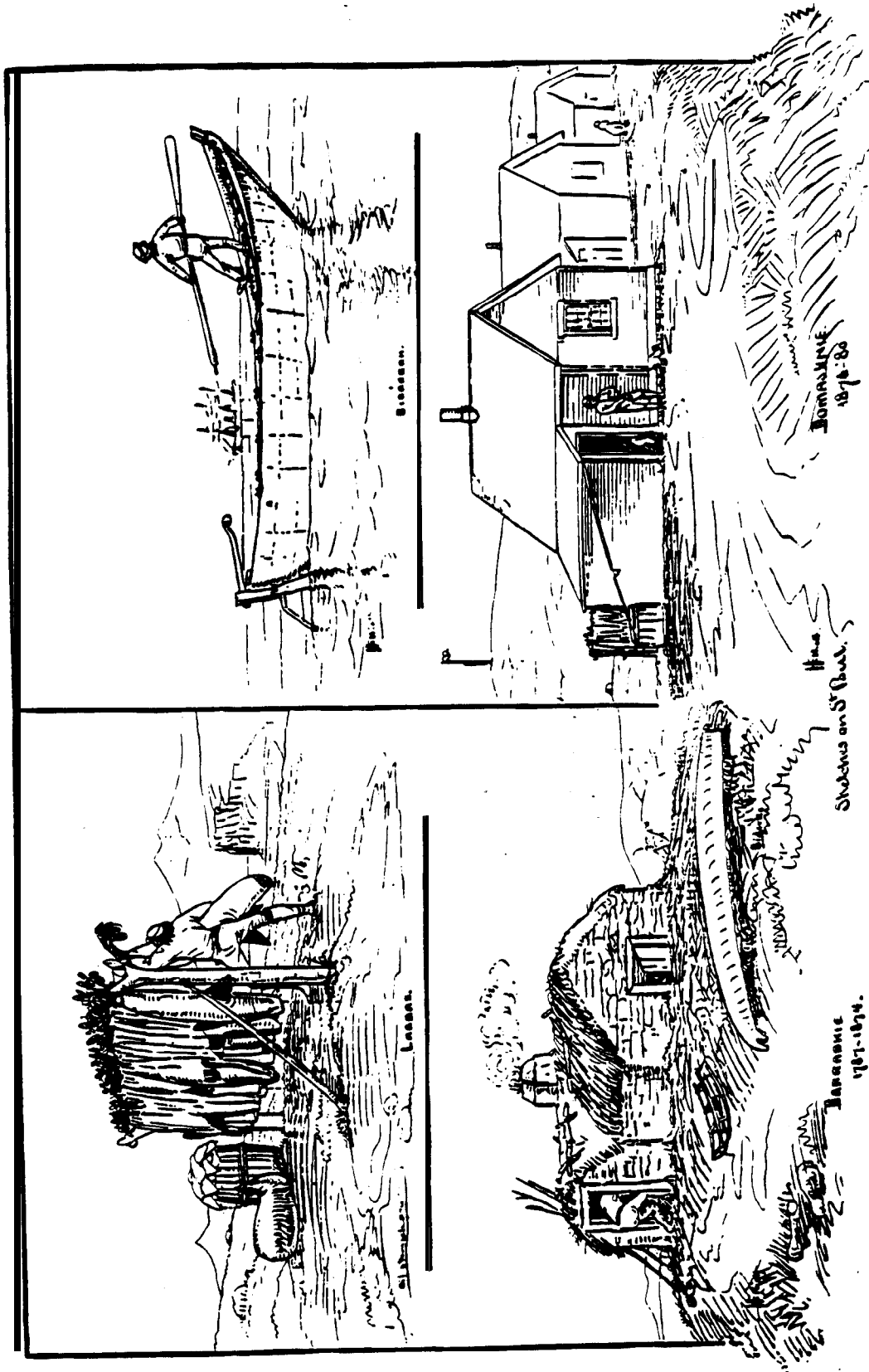
His pen and ink sketches (Figs. 2-5) show that spears were the primary means for killing corralled animals.

Sea lion hunting occurred between the middle of September and November, after the fur seals had left the rookeries for the season. Hunting was done on the rocks at night by moonlight, and selected animals were captured and put into corrals rather than killed outright. After several nights of corralling, two or three hundred animals were then driven or herded overland and through freshwater lakes for eleven miles to the village--a process that spanned from five days to three weeks--before being slaughtered for food. In addition, sea lion whiskers had some commercial value, being sold for a penny apiece to the Chinese in San Francisco, but the primary use of the animals was for food and clothing.

In the early 20th century, Edward Curtis (1930:30-31) reported that young sea lions were pursued in the water by Nunivak Island Eskimo kayak hunters who used "light casting javelins." The Nunivak hunters also clubbed sea lions during the summer when they were found sunning on the rocks. The meat was divided equally by each of the hunters, with the "owner" (first man to make the strike) taking the upper portion. Curtis observed that Nunivak hunters took sea lions both in the spring, as the animals migrated north, and again in the fall during their southern migration. Sea lions and hair seals were the first marine mammals to appear in the spring, followed by smaller hair seals with their young, and then by spotted seals and walrus.

According to Curtis, sea lion hides were used to make snares for caribou, although by the time he made his observations, no caribou remained on the island. Today elders recall that sea lions were hunted on Nunivak Island primarily for their hides, which were used to cover kayaks. When kayaks were replaced by skiffs and outboard motors, the people there stopped hunting sea lions (Henry Shavings, pers. comm.).

FIGURE 2. (FROM ELLIOTT 1887)



THE SEA-LION HUNT ON PRIBILOF ISLANDS.

Oil-pouch of sea-lion stomach; seal-meat frame; bidarrab covered with sea-lion skins; sealers' houses. (Sect. v, vol. ii, pp. 471, 473.)

Drawing by H. W. Kilgus.

FIGURE 3. (FROM ELLIOTT, 1887)

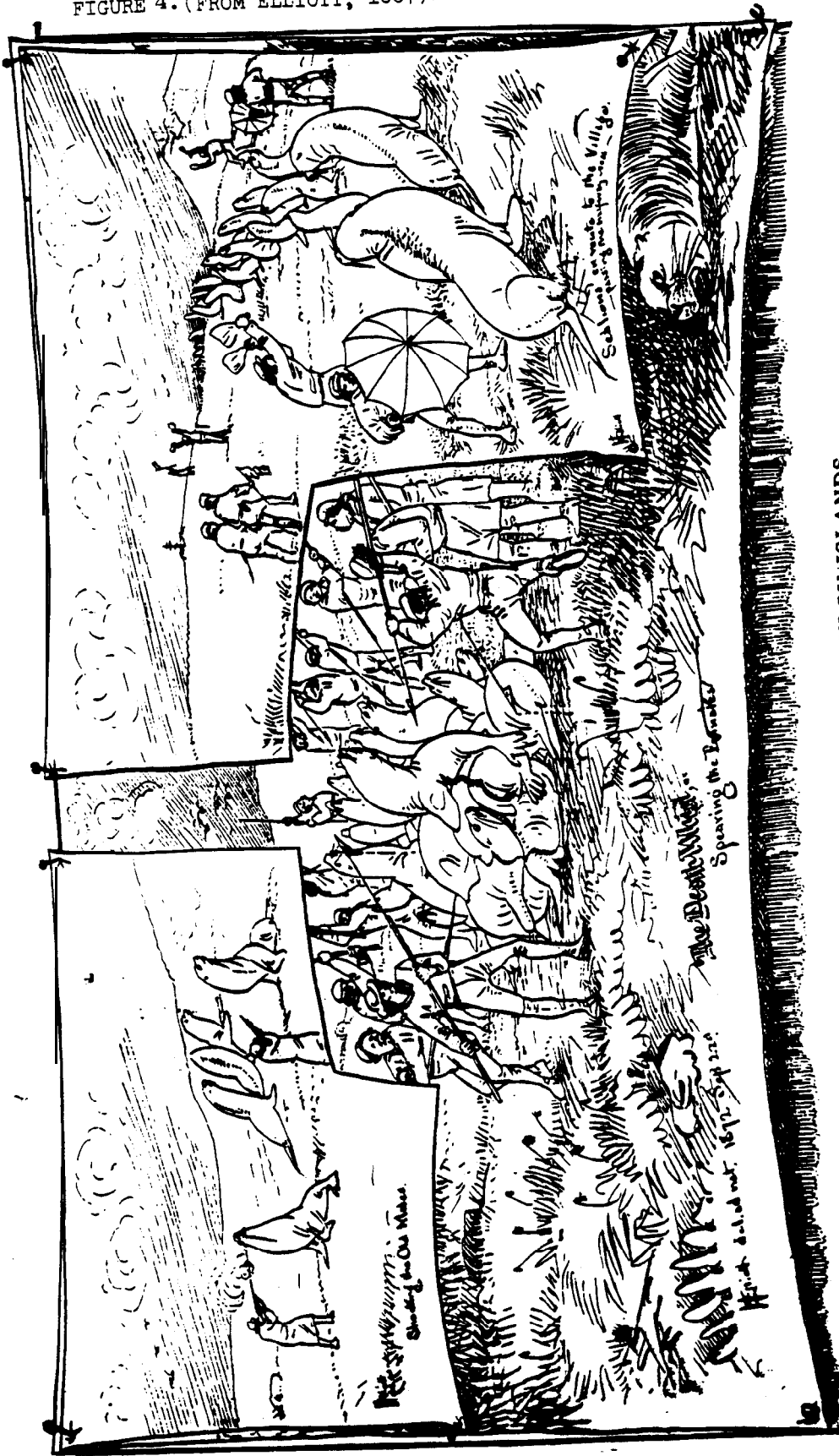


THE SEA-LION HUNT ON PRIBYLOV ISLANDS.

Native capturing the sea-lion : springing the alarm. (Sect. v, vol. ii, p. 408.)

Drawing by H. W. Elliott.

FIGURE 4. (FROM ELLIOTT, 1887)



THE SEA-LION HUNT ON PRIBYLOV ISLANDS.

Shooting the old maas; spearing the surround; the drive. (Seot. r. vol. ii, pp. 468, 469, 471.)

Drawing by H. W. Elliott.

FIGURE 5. (FROM ELLIOTT, 1887)



THE SEA-LION HUNT ON PRIBYLOV ISLANDS.

The corral of sea-lions at the Barrabbers, under Cross Hill, Northeast Point, St. Paul's Island. (Seot. v, vol. ii, p. 468.)
Drawing by H. W. Elliott.

On King Island, Eskimo hunters prevented sea lions from sinking by jabbing carved ivory sticks next to the bones, inserting a tube so air could be blown into the spaces, and then plugging the holes so that the carcass would float, thereby allowing the animal to be towed home (Curtis 1930:101). On Little Diomed, at the extreme northern end of the sea lion's range, Curtis reported that the animals were harpooned through the ice at breathing holes and retrieved with a 20-fathom line. At Wales, sea lions were harpooned and then clubbed in order to save the blood (Curtis 1930:142). During the fall at Wales, nets were set for seals, sea lions, and beluga whales. These nets were about 12 feet deep and fashioned from strips of seal skin held up by floats made from sea lion bladders or flippers and anchored with stones (Curtis 1930: 145).

Historic uses of the sea lion in the Aleutian Islands were described by the archaeologist William Laughlin (1980:49). In 1954 John Gordioff collected detailed butchering instructions for the animal while visiting a fish camp near Unalaska operated by Anfesia Shapsnikoff (Ransom 1983:84-85):

1. Kill and bring in the sea lion. Split open the bell and lay back the ribs. The first step is to remove all the intestines. Be careful not to cut useful parts and ruin them.
2. Carefully cut the skin up the length of the bottom of a boot from the head to the shoulder. This will be used for making boots. This thickest part of the skin (about 1 inch thick) will be used and dried for soles.
3. Take off the remaining skin, cutting around the flippers and feet. This will be used for the outside covering of bidarkies [kayaks].
4. Take feet and flippers off. Save all skin on these for using on the soles of boots. The rubbery part of the flipper makes a gripping surface.
5. Remove the arm with the shoulder. Use this for dried meat. This part of the sea lion is the heaviest and contains the most meat of any part.
6. The breast and ribs are salted down for food.
7. The back part of the ribs are cut along the spine. All leg parts are removed with these and used in cooking. If killed in May, the blubber is 4 inches thick.

8. The blubber is salted down for eating with dry fish. It is also melted for oil. Blubber is taken from the meat. Each chunk of meat is given to a family with the blubber attached since the hide is peeled away without the blubber.
9. Save the stomach. Clean and remove any meat. Turn the stomach inside out, wash, and after returning to original shape, dry it. This is used for storage of oil or other liquids.
10. Cut out the throat clear up to the stomach and remove. This is dried and used for the leg part of the boots.
11. Save all the gut. Clean and dry. This is used for the rain coat. One sea lion will make two average- sized coats. The gut opens up to about 1 1/4-inch width and the strips are sewn together with sinew to make the coat.
12. Long ago when sea lions were being butchered, the first thing to be removed was the thin tissue covering of the heart. This was removed very carefully so as not to tear it. It was rinsed in salt water and stretched over the peak of the wooden hat. While the rest of the sea lion was butchered, this tissue dried sufficiently to be lined with cloth. It was used as a carrying bag while traveling. It was used to hold tea because it was waterproof and pliable.
13. Eat the heart after soaking it in salt water. It may be baked, boiled, or eaten raw.
14. Eat the liver from a young sea lion. The liver of big sea lions is bitter to the taste.
15. Save the bladder. This is dried and used for a halibut hook buoy as a float.
16. Sea lion whiskers were used to decorate wooden hunting hats. They were also used for pipe cleaners by modern tobacco smokers.

Historically, sea lion products were crafted into items of clothing, some of which are preserved in museum collections. For instance, the Washington State Historical Society exhibition entitled, "Russian America: the Forgotten Frontier", contains an 1840 Aleut hat constructed out of sea lion gut (from the Museum of Anthropology and Ethnology, Academy of Sciences, U.S.S.R.), a Russian-style greatcoat of sea lion intestine made in the early 19th century (from the Anchorage Museum of History and Art), and an 1888 Tlingit war helmet with a sea lion motif (from the Sheldon Jackson State Museum in Sitka) (Smith and Barnette 1990). Black (1982: 135, 139) has described how sea lion whiskers were used as "plumes" decorated with beads and feathers in Aleut men's bentwood hunting hats.

FOLKLORE

The cultural significance of sea lions in Koniag traditional culture is suggested by several factors. One elder in Old Harbor, for example, was given the nickname *Winaq*, the Alutiiq word for sea lion, as his personal nickname. A common folk belief on Kodiak Island is that sea lions carry round rocks in their stomachs and if angered, will spit these rocks at intruders with considerable force. Some people believe sea lions carry these rocks in their stomachs as ballast, and that this additional weight allows them to dive deeper for their food.

A strong taboo, voiced by two elders in Old Harbor, is that hunters should not let any metal touch the rocks where sea lions haul out. This taboo is focused on the careless handling of rifle barrels, and the reckless discard of gun shells. Elders believe that sea lions dislike the smell of iron and steel, and that the presence of small traces of metal will result in their avoidance of an entire area. Cape Alitak, where there were once many sea lions, is thought to have been abandoned in modern times due to the carelessness of hunters. Also sharing the blame at Cape Alitak are local fishermen who drill holes in the rocks and plant steel rods in them to anchor their salmon set nets.

Among the Tlingits of southeast Alaska, sea lions (*taan*) appear very prominently in traditional oral narratives. These narratives establish the fact that sea lions were commonly speared on the rocks where they hauled out. In addition to barbecuing and drying the meat, the heroes in these stories crafted thongs from sea lion hides, made water containers from sea lion stomachs, and gathered sea lion whiskers to make cushions, pillows, and kneeling pads, and to decorate their hats and headdresses. In one story, a stranded hunter named Naatsilanei visits the sea lion people living in a village beneath the sea and helps remove a bone spear head from a wounded sea lion. In another story, which

provides a popular motif for Tlingit totem poles, a strong man tears a big bull sea lion in two with his bare hands in order to avenge the death of his uncle (Dauenhauer and Dauenhauer, 1987: 93, 97,115,147,330,350,358).

In the Aleutian Islands sea lions also figure prominently in traditional oral narratives. At the turn of the century, for example, Frank Golder collected a legend from Mrs. C.A. Anderson of Attu, about a woman who was left alone for seven years after her people were killed off by invading warriors from Atka. The woman is said to have survived “mostly on sea lions and sea otters, which she killed with clubs while they were on the rocks” (Golder 1905:215).

The importance of sea lions in Aleut oral tradition is also illustrated in the large corpus of tales collected at Unalaska and Nikolski by Waldemar Jochelson in 1909-1910 (Bergsland and Dirks 1990). These tales describe traditional Aleut hunting of sea lions that incorporates magical elements through which hunters are transformed into sea lions. As an appendix to these tales, Bergsland and Dirks (1990:695) republished ten songs collected by Ivan Veniaminov in the early 19th century, including this one dealing with sea lions obtained from Semyon Pan’kov of Unalaska:

The dancer is girding himself, it is said.

Look, girded with the hide of a sea lion of Chiknunax,
beside the southern rookery of this island Unalaska, and
having its stomach as a bladder, he is standing up to
dance, the dancer out there (on the floor).

Look, girded with the hide and stomach of a seal of the island
Kitanamax on the south side of the pass Isanax here
in the East, he is standing up to dance, the dancer out there.

Look, girded with the hide of a land otter of the Island
Anganaxsix on the south side of the land Alaxsxix there
farther east, he is standing up to dance, the dancer out there.

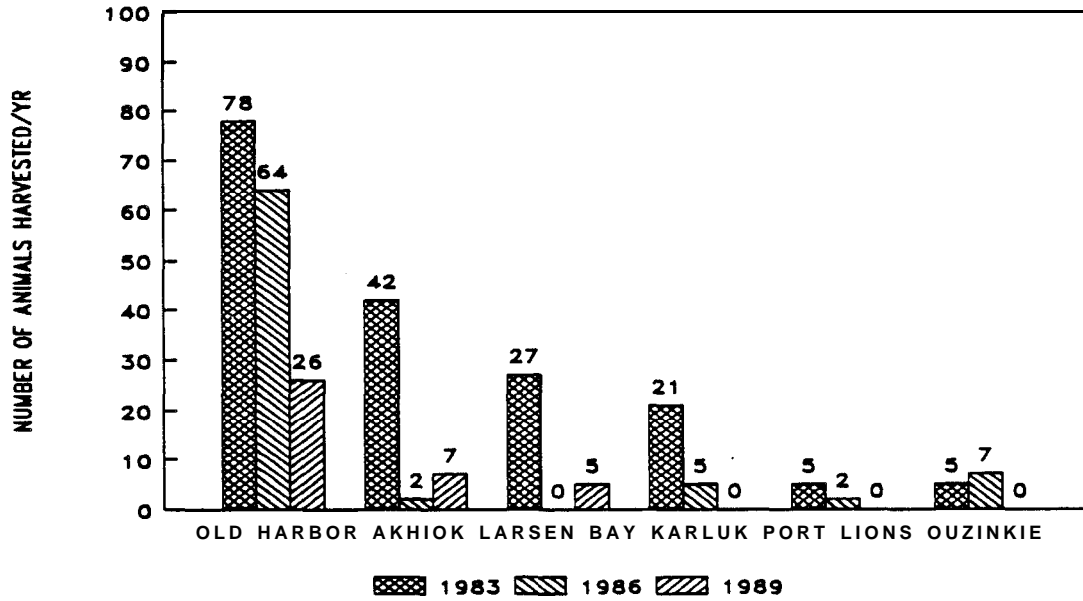
It is evident in this song that each Native community in the eastern Aleutians is identified with a particular sea mammal or land mammal, and that the sea lion's hide and bladder represented Unalaska Island. Consistent with this, under the Alaska Native Claims Settlement Act of 1971, the village of Unalaska incorporated itself as the Qualining Tribe of Alaska (or *qawalangin*) which the elders state is etymologically derived from *qawax*, the Aleut name for sea lions (see also Black 1982: title page). This suggests that the community of Unalaska continues to be highly focused on the sea lion and that this sea mammal is richly symbolic of its traditional subsistence economy.

In a similar fashion, the island near Nikolski known as Anangula or Ananaiuliak, where a 3,000 year old archaeological site has been found (Laughlin, 1980), is regarded as a kind of giant sea mammal. "The people call the head of the island *Qiiganga*, meaning the head of a sea mammal; while the tail of the island is called *chmagh*, meaning the tail of a fish or whale" (Swetzof 1991).

CONTEMPORARY USES

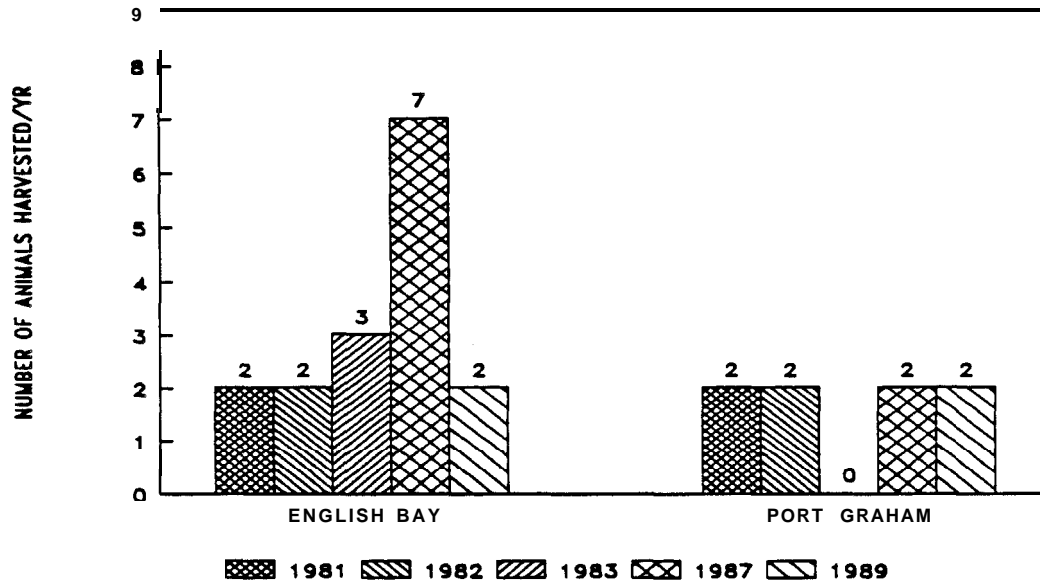
Steller sea lions currently are harvested and used in many Alaskan communities within their ecological range. Sea lions are hunted by Alaska Natives from at least four different language groups: Alutiiq, Aleut, Central Yup'ik, and Siberian Yup'ik. Alutiiqs call them *wiinaq*, Aleuts call them *qawax*, Central Yup'ik Eskimos call them *uginaq* or sometimes *apakcuk* (Nunivak Island), and Siberian Yup'ik Eskimos know them as *ulgaq*. Contemporary uses of sea lion in Alaska have not been studied in detail by the Division of Subsistence, although sufficient data have been compiled in the Lower Alaska Peninsula, Lower Cook Inlet, Prince William Sound, and the Kodiak Island area to indicate that sea lions continue to be actively used as a subsistence resource (see Figs 6-9).

Figure 6. KODIAK AREA
 SUBSISTENCE SEA LION HARVESTS



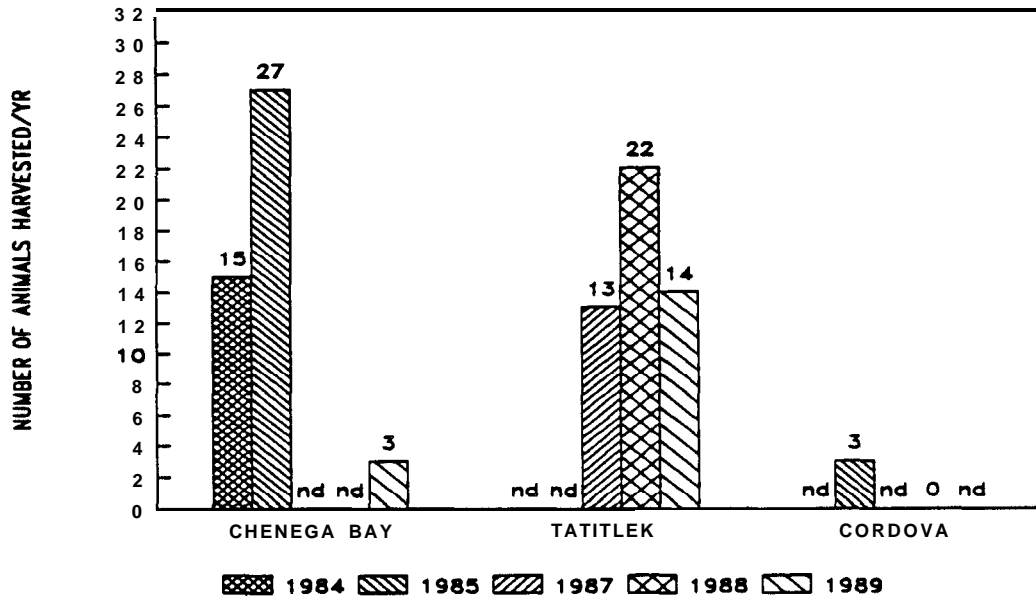
Source: Alaska Department of Fish & Game
 Division of Subsistence, Anchorage

Figure 7. LOWER COOK INLET
SUBSISTENCE SEA LION HARVESTS



Source: Alaska Department of Fish & Game
Division of Subsistence, Anchorage

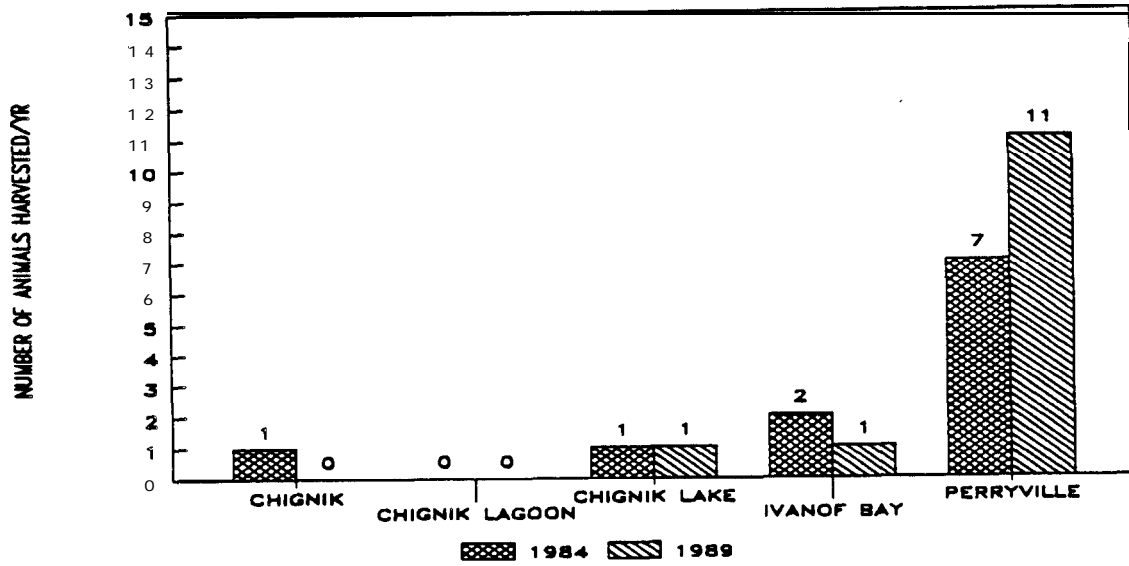
**Figure 8. PRINCE WILLIAM SOUND
SUBSISTENCE SEA LION HARVESTS**



Source: Alaska Department of Fish & Game
Division of Subsistence, Anchorage

nd = no data

**Figure 9. LOWER ALASKA PENINSULA
SUBSISTENCE SEA LION HARVESTS**



Source: Alaska Department of Fish & Game
Division of Subsistence, Anchorage

Table 1 presents additional information on recent sea lion harvest levels for several other Alaskan communities. The discussion which follows summarizes what we have learned about sea lion hunting and use in various communities and subregions of the state.

Table 1. Sea Lion Harvest and Use in Selected Communities*

<i>Community</i>	<i>Year</i>	<i>Number</i>	<i>Percent of Households</i>		
		<i>Harvested</i>	<i>Hunting</i>	<i>Harvesting</i>	<i>Using</i>
Atka	1982-83	** 15-25	NA	NA	NA
Brevig Mission	1984	NA	NA	4	4
Cordova	1985	3	.5	.5	2.4
Dillingham	1984	0	0	0	0.7
Manokotak	1985	15	28	20	35
Quinhagak	1982	16	NA	17	NA
St. George	1980-81	**35-40	NA	NA	NA
St. Paul	1980-81	**35	NA	NA	NA
San Juan Bay	1984	NA	NA	NA	33
Unalaska	1981-82	**20	NA	NA	NA

NA = Not available

**Estimated harvest

*Additional communities in which sea lion harvest and use may occur but for which harvest documentation is lacking include but are not limited to: Egegik, Goodnews Bay, Hooper Bay, King Salmon, Kodiak City, Mekoryuk, Naknek, Newtok, Nightmute, Platinum, Scammon Bay, South Naknek, Togiak, Toksook Bay, Tununak, Savoonga, and Aleutian Island communities not listed above.

Kodiak Area

Following the listing of sea lions as “threatened” in the spring of 1990, the Alaska Department of Fish and Game, Division of Subsistence, conducted focused interviews with sea lion hunters in Kodiak Island villages. Harvest estimates from all six Kodiak Island villages are now available for 1983, 1986, and 1989 (see Fig. 6). Three Kodiak villages where sea lions continue to be an important staple in the diet are Old Harbor, Akhiok, and Larsen Bay. In 1990, fourteen active harvesters were identified in Old Harbor, five in Akhiok, and three in Larsen Bay. As shown in Fig. 6, harvests have declined during the 1980s in these communities commensurate with the overall decline in sea lion populations. The possible impacts of the *Exxon Valdez* oil spill on sea lion numbers and subsistence harvest levels were not examined, but respondents did not mention this as a factor.

Sea lions also are harvested and eaten in Karluk, Ouzinkie, and Port Lions; use in these communities also appears to have declined during the 1980s. In Karluk, the decline in use was clearly related to the overall population decline in sea lions, according to hunters. One hunter there said, “We would eat them, but we just don’t see them much any more.” In Ouzinkie and Port Lions, interviews with key respondents suggest there may be a more general and gradual dietary shift away from sea mammals. The possible reasons for this changing behavior were not examined.

Hunting Methods

According to one elder in Old Harbor, an historic method of hunting sea lions by the Koniag was from 3-holed kayaks. Paddlers occupied the front and back holes, while the middle slot was reserved for the harpooner. The paddlers pulled up alongside rocks where sea lions rested, and the harpooner jumped out. This had to be done very carefully or the kayak was at risk of being severely damaged by the barnacles. The hunter then harpooned the sea lion, cut open its throat, blew air into its lungs, and tied its throat shut with a piece

of line. Then he rolled it over into the water and waited for the kayak to return. When the kayak pulled back up to the rocks, he hopped in and the sea lion was towed to a beach where it was gutted out and cut into small pieces.

Contemporary sea lion hunting in Kodiak Island villages occurs primarily during the fall and early winter months from October through December, although a few hunters go out year round. In recent memory, sea lions were shot on their haulouts at places like Two-Headed Island and Cape Barnabas (near Old Harbor) and transported to the village 20 or 30 at a time aboard purse seiners. In this way one or two hunters provisioned the entire village. The animals were unloaded on shore, and people were invited to go down to the beach and help themselves until the meat was all gone.

This pattern of generalized distribution is still in practice today. However, the hunt primarily involves parties of two or three individuals using motorized skiffs. Due to the carrying capacity of skiffs, the harvest is limited to one or two animals per trip. Almost always the preferred animals are young adults of medium size rather than the huge bulls or young pups. Skiff hunters work most efficiently in pairs, with one man running the outboard motor and one man up front who shoots swimming sea lions with a rifle. Some say the best way is to position one man on shore, then take the skiff to the head of the bay to drive the sea lions back towards the shooter. If an animal is wounded, it is pursued rather than abandoned in favor of another one, according to respondents.

With two skiffs hunting sea lions in the water, another common strategy is to herd them back and forth between the skiffs until the animals are tired and breathless, at which time they can be approached more easily. However, this hunting method expends considerable gasoline. Another proven method for tiring out sea lions in the water is to watch for them to surface and then immediately fire a rifle to make them dive again before they can get a full breath of air. Many gun shells can be expended in the process.

According to hunters, it is easier to chase and kill seal lions in open water with a skiff than with a seine boat. A seine boat cannot keep up with them while a skiff can. Sometimes sea lions start “porpoising” when chased. Reportedly, this makes shooting and retrieval much easier, because a “pot-poising” sea lion has more air in its lungs and will not sink as quickly. Skiff drivers like to chase the animals toward shallow water, where they are easier to retrieve if they do sink after being shot.

Another contemporary method of hunting sea lions on Kodiak Island involves hiding in the rocks along shore and waiting for sea lions to pass by. Because sea lions often swim quite close to the shoreline, the strategy is to shoot them by surprise in fairly shallow water before they recognize the hunter’s presence. After shooting from onshore, the hunter uses a skiff to retrieve the kill. A weighted halibut hook on a hand line works well for retrieving.

Because shooting from a skiff is very unsteady, even in the calmest weather, another hunting method involves shooting sea lions while they are hauled out on rocky pinnacles. This method entails more danger for the hunter because the skiff is landed and tied up while the hunters position themselves on adjacent rocks for a steady shot. Large ocean swells can suddenly come up to swamp the hunters or the skiff. Retrieving the kill on jagged rocks imposes other risks, since the slain animal may fall into inaccessible areas on the rocks which the skiff cannot approach. Even young adult sea lions generally are too heavy for one person to lift into the skiff.

Foodways

There are several traditional ways of eating sea lions which illustrate their importance to the Koniag diet. *Userkiq* is sea lion fat which is fried, jarred, and then frozen. After thawing, it is poured over boiled fish or potatoes or added to *pahinaq*, a mixture of berries, salmon eggs, and mashed potatoes often referred to as “Aleut ice cream”.

Another favorite food is *kolukuyaq*, braided seal or sea lion intestines. Preparing this dish is becoming a lost art; apparently only one woman in Old Harbor still knows how to braid them properly, although in Larsen Bay three or four women retain this skill. First, the intestines are flushed out and rinsed, then braided with long strips of fat and meat. When braided, the intestines look like a thick piece of rope which is coiled up in a pot and boiled (Rostad 1990).

Manaq, or sea lion flippers, which contain a lot of gristle, are boiled with spices and onion, peeled, deboned, and jarred in vinegar. One veteran cook in Larsen Bay claims the flavor and texture of these flippers is comparable to pickled pig's feet. Another method of preparation involves ageing the flippers for a few days and then boiling them with the intestines. When the toenails fall out of the flippers, they are finished cooking and ready to eat.

Another prized part of the sea lion is the liver, which is very mild compared to beef liver, according to respondents. One respondent stated that when he and his brother were very young, they were skinny and anemic, so their mother fed them sea lion livers, and they quickly recovered their health and normal body weight.

Sea lion meat was formerly put up in layers of rock salt to leach the blood. Before being eaten, the meat was removed from the salt and soaked overnight in fresh water to remove the salt. Using salt allowed people to preserve the meat for as long as a year. Today most villagers store sea lion meat in freezers. Some people think that ground sea lion meat is just as good as beef hamburger.

Many Old Harbor residents like sea lion ribs and chest meat, and a few savor organs such as the kidneys and heart. One man prepares sea lion kidneys by poking a hole and stuffing a piece of fat inside before boiling them. Otherwise they will be kind of dry. Another man says, "You can't eat sea lion meat without some fat to go with it. If somebody gives you meat with no fat, you get mad."

Conflicts With Commercial Fisheries

Some Native commercial set net fishermen complain about sea lions getting entangled in and tearing up their nets. They say that sea lions keep their distance as long as someone is watching the net, but as soon as the net is left unattended, they move in to eat their catch. These fishermen frequently employ commercial seal bombs or fire rifle shots to scare sea lions away. Most fishermen who shoot sea lions for interfering with their nets report they salvage the meat for subsistence use; however, others say this is not consistently done.

One Old Harbor fisherman who makes his living by commercially seining salmon and herring and who is also a subsistence sea lion hunter, does not view sea lions as any threat. He insists that sea lions do not bother salmon fishermen. Instead, they just swim over the corks and actually help the herring fishermen by scaring the schools closer to the surface. Another fisherman from Old Harbor who does not hunt sea lions for subsistence use reports that he shoots sea lions whenever they swim into his purse seine and threaten to spook schools of red salmon.

Local Perceptions of the Sea Lion Population

Hardly anyone in Old Harbor, the community which probably harvested more sea lions than any other in Alaska during the 1980s, believes sea lion numbers are declining. Most hunters report that sea lions appear to be on the increase in their hunting areas because they consistently observe more of them near the village. Hunters agree that there are now fewer sea lions at Cape Barnabas, a haulout in the group's hunting territory. However, this is the only place where they have seen a decline. It seems to hunting experts in Old Harbor that the sea lions have dispersed into smaller groups and are moving into different feeding areas, namely, the protected bays and channels near the village. One reason they move into the bays in early spring is to feed upon the herring. The sea lions

also are now present in places like Three Saints Bay and Deadman Bay, where they were never or only rarely observed before.

Hunters in Ouzinkie and Larsen Bay have also seen more sea lions in recent years, while Karluk hunters have observed fewer animals in the late 1980s. Ahkiok hunters reported a decline in the late 1980s, following several years in the mid-1980s when increases were noted (especially in Deadman Bay).

Unalaska

Sea lions have been an important resource to the Aleuts since the precontact period. About a dozen Unalaska hunters actively sought sea lions in 1982, according to Veltre and Veltre (1982). Annual harvests ranged from 5 to 50, with an average of about 20 animals being taken. Sea lions were taken throughout the year. Most winter hunting occurred in Unalaska Bay and in other seasons at Bishop Point, Winslow Island, Unalga Island, Beaver Inlet, and points between.

Skiffs 14-16 feet in length with 25 to 30-horsepower engines were used for hunting in the early 1980s. During long trips in mid-May through August, two or more boats often hunted together. Most sea lions were taken in the sea with .222 or .30-.30 rifles, sometimes after being chased from haulout areas, and retrieved with a weighted hook attached to a line. Some wounded animals were lost and not retrieved.

In Unalaska, sea lion meat was preferred to that of harbor seals. A successful hunter gave portions of his catch to older persons, relatives, and friends. Sharing was less extensive than in the past, due primarily to fewer animals being taken. The meat was eaten fresh or preserved for later use by freezing, drying, smoking, or salting. Skins sometimes were fashioned into gun and knife cases and mittens, while the throats and intestines were made into dolls, and bones were carved. Sea lions were ranked among the most important

subsistence resources by Native households during the Veltres' study. This is consistent with the important role of sea lions in Unalaska folk tales and folk songs.

Unalaskans have also developed a fairly elaborate sea lion cuisine. During the mid-1970s students at the Unalaska high school interviewed elders and collected several fairly complex recipes for such dishes as *studinax* (ground sea lion flipper with vegetables), *kakliikax* (sea lion meat balls), and sea lion soup (Shelikoff 1977).

Akutan

While no sea lion harvest data are available from Akutan, Braund (1986:96) reports that “although sea lion populations have declined in recent years, they are still found in large numbers near Akutan and remain a preferred subsistence species among community residents.” He also notes that marine mammals in this community “constitute a significant portion of locally produced protein.” During a recent field visit to Akutan, Hutchinson-Scarborough (1991) confirmed this observation and learned that Akutan residents still actively hunt sea lions year-round in the Baby Islands, Akutan Harbor, and Akutan Bay. One elderly hunter also reported hunting them infrequently on parts of the northern Akun Island rookery, but apparently no hunting has taken place on southwest Akutan Island (another nearby rookery) since World War II, a transitional period which disrupted and permanently changed traditional subsistence harvest patterns. As in Kodiak city's inner harbor, sea lions are attracted to Akutan harbor's cannery fish waste products and the bycatch thrown overboard by fishing boats when they deliver to the canneries.

As far as technology is concerned, Akutan hunters say they shoot their sea lions with a shotgun rather than a small bore rifle such as a .30-.30, favored by the Koniag and most other Aleuts. Aleuts in Akutan, Atka, and Nikolski, however, all continue to use a special retrieving hook for sea lions called a *qayux*, which is made by binding a large steel halibut

hook to a piece of wood measuring about eight inches long. On one end of the wood is a short piece of line with a heavy 3/4 lb. lead ball attached, while the other end is attached to a long coil of heavy fishing line. After a sea lion has been shot, the qayux is tossed out of the skiff over the place where the sea lion is sinking down into the water. The hunter may have to toss and retrieve the qayux several times before he snags the animal and pulls it up to the skiff.

Atka

Use of sea lion in Atka has been described by Veltre and Veltre (1983). Atka sea lion hunting was done primarily from skiffs along the coast of Atka and Amlia Islands during the early 1980s. Veltre and Veltre (1983) observed that sea lions were hunted by pairs of men traveling in three or four skiffs. Women also were known to be active harvesters, something very uncommon in other regions. When a hunter spotted a sea lion or a seal, he communicated with the other skiffs by using hand motions.

Sea lions generally were driven towards shallow water and the beach. If shot there, they were retrieved with a qayux and butchered at the side of the skiff or hauled to the shore and butchered there. If they floated after being shot, they were retrieved with a hook attached to a float, which was thrown over the animal and pulled back towards the skiff. About 15-25 sea lions were taken in an average year, with a substantial number of additional animals lost due to sinking in deep or murky waters.

Sea lion meat was shared throughout the village. If large numbers of animals were taken, hunters used the CB radio to invite others to go down to the beach and claim a portion of the meat. Sea lions were butchered into five main parts, and the liver and heart were also consumed. The meat and flippers were roasted, fried, boiled, and stewed, often

after they had been salted and aged for a few days. The blubber was sometimes jarred for several weeks and rendered into oil for fried bread, or the oil was served with dried fish.

Nikolski

Afenogin, a Nikolski hunter and storyteller, told Ted Bank in the early 1950s that a large sea lion stomach, after being removed and cleaned, held up to four hundred dried red salmon for winter use: “The fish were put in and the air sucked out” (Bank 1956:227). In earlier times, sea lion skins were also used to wrap human corpses for cave burials (Bank 1956:229).

Laughlin (1980) described the sea lion hunt in Nikolski as one conducted by relatively few men but with a community-wide distribution. Hunters in as few as one or two boats scanned a rookery for sea lions. If they found sea lions, they attempted to shoot six or eight young animals and load them for the trip home. At the village, men butchered the animals on the beach while the women cut special parts destined for use in handicrafts. Chunks of meat were placed on upturned boats and made available to other residents. The hunters and boatsmen were allowed to take larger amounts if they desired, while the successful hunter claimed the hide.

Hutchinson-Scarborough (1991) interviewed several Nikolski hunters and learned that two areas are still used for sea lion hunting--Pancake Rock and Ananaiuliak Island (Anangula). Around Nikolski, sea lions are found mostly on the Bering Sea side of the islands, while seals are more plentiful on the Pacific Ocean side. Nikolski hunters generally prefer to hunt sea-mammals in late winter, from January through April. However, because sea lions no longer figure very prominently in the Nikolski diet, the annual harvest there is fairly small.

Pribilof Islands

The use of sea lions by the Pribilof Islanders was first documented in the early 1800s by Khlebnikov (1979, cited in Veltre and Veltre 1981). Khlebnikov described the hunt and estimated the annual harvest in St. George and St. Paul as 1,300-1,400 adults plus an undetermined number of young sea lions.

A general decline in the number of sea lions harvested on the Pribilof Islands was noted in the early 1980s (Veltre and Veltre 1981). This decline was attributed to the Aleuts losing their taste for the species; however, sea lions remained an important subsistence resource on both St. George and St. Paul islands (Veltre and Veltre 1981).

Contemporary sea lion hunting on St. Paul occurs mainly around Northeast Point and Reef Point, with other locations including at and north of Halfway Point; near Zapadni Point on the west side of English Bay; Southwest Point; and at Whale Point and Lukanin Point on the east side of Lukanin Hill (Veltre and Veltre 1981). Hunting locations often were determined by weather conditions (e.g., Northeast Point was accessible by a road, but the road often was closed due to blowing snow) and transportation sources (three-wheeler, snowmachine, truck, skiff, or walking).

Hunting was conducted by individuals or by small groups of men. Successful hunters butchered and kept what they considered to be the choice parts and shared the remaining portions with other members of the party, family, and friends. An estimated 35 sea lions were killed and retrieved over a 12-month period during 1980-81, with an equal number shot but lost (Veltre and Veltre 1981:106). An informal count of sea lions harvested over the winter of 1990-1991 showed the harvest to be down to about 20 animals, and some St. Paul people have observed that sea lions are becoming increasingly aggressive in their consumption of baby seals (Mercurieff 1991).

Traditionally, hunting on St. George occurred along stretches of shoreline cliffs along the northeast side of the island, the Zapadni Bay coast, and southeast of Dalnoi Point. Hunting patterns resembled those on St. Paul, although boats were more often used on St. George because of the more limited road system. Residents considered the 1980-81 season a poor one, as St. George hunters took only 10-20 animals. Of those animals shot, more were estimated to have been lost than were retrieved. Normally the harvest on St. George would have been 35-40 sea lions.

Eastern Bering Sea Coast

In contrast to the winter hunting done in most Koniag and Aleut communities, Yup'ik-speaking villagers at Togiak, Goodnews Bay, and Quinhagak take sea lions during the spring in April and May. At Goodnews Bay the hunting is more opportunistic than strategic, with seals, sea lions, and walrus being taken while villagers are out collecting bird eggs (Wolfe *et al.* 1984:327,332). In Togiak and Quinhagak, sea lion hunting coincides with the harvesting of herring and herring roe-on-kelp and with the arrival of spring ducks and geese (Wolfe *et al.* 1984:343-345).

At Tununak on Nelson Island, Pete (1990) reports from her field notes:

Tununak hunters seldom targeted sea lions when hunting. These animals were considered too difficult to kill and their meat was not highly prized by man residents. Sea lions were most commonly harvested incidentally while seal hunting; no one went out just to hunt sea lions. The rare times sea lions were hunted were when they were perceived to threaten to disturb nets set for herring or salmon.

Sometimes while halibut fishing, people felt compelled to shoot at sea lions to scare them off if the sea lions vocalized threateningly and swam too close to boats. According to several respondents, this was occurring more frequently in recent years (i.e., the 1980s), leading some people to believe that sea lion numbers were increasing, or that their range was expanding. If a sea lion was wounded, a concerted effort was made to kill and retrieve it for food.

Southeast Alaska

Sea mammal harvest was a component of the traditional subsistence economy of the northwest coast culture groups, including the Tlingit and Haida of southeast Alaska. Harbor seals have been and continue to be the primary sea mammal used for subsistence in Southeast Alaska, although the ethnographic literature describes historic Tlingit and Haida use of sea otters, sea lions, fur seals, and porpoises as well (deLaguna 1990; Blackman 1990). The hide of the sea lion was valued for heavy line or ropes, and the fat was a source of what was traditional low-grade oil, suitable for impregnating and waterproofing wooden implements such as halibut hooks, salmon gaff hooks, and herring rigs (deLaguna 1990; Robert Willard, pers. comm.).

Systematic studies designed to collect specific information on sea lion use have not been conducted in southeast Alaska. Subsistence harvest surveys completed during the 1980s in southeast Alaska communities did not document any harvests or use of sea lions during the years of the studies (Division of Subsistence 1991). This suggests that there may not be a significant contemporary harvest of sea lions, but questions have not yet been specifically asked about this activity.

CONCLUSIONS

Hunters have noted changes in sea lion distribution in some parts of the species' range in Alaska. On Kodiak, hunter reports suggest that sea lions may gather together in large numbers when there is a food surplus but disperse to exploit a larger territory when food is less abundant or less concentrated. Thus, both the total numbers of sea lions and their population density is reduced when they are stressed. Consequently, the large "urban"

colonies located on the edge of the open sea are reduced in size, and sea lions are sighted more often swimming in small groups in protected inside waters close to villages.

During the 1980s, annual subsistence harvests of sea lions appear to have declined rather dramatically on Kodiak Island, while remaining relatively stable in Lower Cook Inlet, Prince William Sound, and the Lower Alaska Peninsula (Figs. 7-9). Other coastal regions where sea lions are harvested have not been studied adequately to determine trends. The situation, therefore, is not as quite as bleak as indicated by one expert who recently wrote that “Native harvests are not reported and therefore the numbers of sea lions taken are unknown” (Hoover 1988:178). At the same time, it is undeniable that there are still large gaps in our knowledge and a very great need for additional data.

Accordingly, the total statewide subsistence harvest of sea lions cannot be accurately estimated from existing harvest information in the Division of Subsistence Community Profile Data Base (see Table 2). Clearly, further field research in the form of a series of annual statewide harvest surveys needs to be undertaken. During the early 1980s, the annual harvest for the 25 communities in which kills were documented was between 300-400 sea lions. During the late 1980s, the subsistence harvest appears to have been considerably less, due to declines on Kodiak Island and perhaps in other areas. There are another 25-30 communities where at least some harvest of sea lions is likely and numerous others where the animals may be taken but for which no harvest data are available. During the late 1980s, however, the annual subsistence taking of sea lions in Alaska appears to have been less than one per cent of the total sea lion population (estimated in 1989 and 1990 to be 25,000 animals in the area from the Kenai Peninsula to Kiska Island).

Finally, it should be noted that there is a widespread misapprehension among Native hunters that it is illegal for them to take sea lions for subsistence because of their widely publicized listing as a threatened species. All over the state Native hunters are

increasingly afraid of being prosecuted if they do take sea lions, even though the National Marine Fisheries Service emergency ruling in 1990 did not limit their rights under the Marine Mammal Protection Act of 1972. This misunderstanding in itself will almost certainly lead to a reduced overall harvest in coming years.

Table 2. ESTIMATED OR DOCUMENTED ALASKA SUBSISTENCE SEA LION HARVESTS FOR COMMUNITIES WITHIN THE RANGE OF STELLER SEA LIONS

Key: * *Some harvest likely and No data available*
 -- *Harvest unlikely*

	1985 COMMUNITY POPULATION	ESTIMATED OR DOCUMENTED HARVEST
SOUTHEAST ARCHIPELAGO		
Angoon	652	nd
Bal. of Petersburg Census SA	274	nd
Bal. of Wrangell Census SA	193	nd
Beecher Pass	44	--
Cape Pole	50	--
Coffman Cove	272	--
Craig	1131	--
Edna Bay	66	--
Elfin Cove	47	--
Gustavus	217	--
Haines	1991	nd
Hollis	75	--
Hoonah	917	nd
Hydaburg	463	nd
Hyder	81	--
Kake	634	nd
Kasaan	83	nd
Klawock	716	nd
Klukwan	153	nd
Metlakatla	1428	nd
Meyers Chuck	53	--
North Whale Pass	83	--
Pelican	234	--
Petersburg	3186	--
Point Baker	35	--
Port Protection	58	--
Port Alexander	131	--
Saxman	273	nd
Sitka	8160	nd
Skagway	637	--
Tenakee Springs	142	nd
Thorne Bay	412	a-
Wrangell	2387	nd
Yakutat	682	nd
TOTAL	25960	

Table 2. (continued)

	1985 COMMUNITY POPULATION	ESTIMATED OR DOCUMENTED HARVEST
PRINCE WILLIAM SOUND		
Chenega Bay	60	3-27
Cordova (includes Eyak)	2307	3
San Juan Bay	17	0
Tatitlek	112	13-22
TOTAL	2496	
LOWER KENAI PENINSULA		
English Bay	192	2-7
Port Graham	188	0-2
Seldovia	403	--
TOTAL	783	
KODIAK ARCHIPELAGO		
Akhiok	109	2-42
Bal. of Kodiak Island Census SA	3727	*
Karluk	114	0-21
Kodiak City (including Chiniak)	6173	6
Kodiak Coast Guard Station	1731	0
Larsen Bay	217	0-27
Old Harbor	344	26-78
Ouzinkie	235	0-7
Port Lions	302	0-5
TOTAL	12952	
ALEUTIAN-PRIBILOF ISLANDS		
Adak Station	4665	--
Akutan	80	8
Atka	931	5-25
Attu	31	*
Bal. of Aleutian Island Census Area	49	nd
Nikolski	46	*
Saint George	191	35-40
Saint Paul	466	20-35
Shemya Station	613	--
Unalaska	1331	20
TOTAL	7565	

Table 2. (continued)

	1985 COMMUNITY POPULATION	ESTIMATED OR DOCUMENTED HARVEST
ALASKA PENINSULA		
Chignik Bay	129	0-1
Chignik Lagoon	40	0
Chignik Lake	164	1
Cold Bay	157	nd*
Egegik	112	
False Pass	77	1
Ivanof Bay	49	1-2
King Cove	547	nd
King Salmon	648	8
Naknek	382	*
Nelson Lagoon	44	nd
Perryville	137	7-11
Pilot Point	79	0
Port Heiden	108	0
Sand Point	671	nd
South Naknek	195	8
Ugashik	10	0
TOTAL	3549	
BRISTOL BAY		
Aleknagik	180	--
Bal. of Bristol Bay Census Area	34	nd
Bal. of Dillingham Census Area	118	nd
Clark's Point	79	0
Dillingham	2141	0
Ekwok	107	0
Igiugig	38	0
Iliamna	126	0
Kokhanok	68	0
Koliganek	161	0
Levelock	109	0
Manokotak	309	15
New Stuyahok	339	0
Newhalen	165	0
Nondalton	234	0
Pedro Bay	70	0
Port Alsworth	67	0
Portage Creek	35	nd

Table 2. (continued)

	1985 COMMUNITY POPULATION	ESTIMATED OR DOCUMENTED HARVEST
Togiak	556	*
Twin Hills	44	*
TOTAL	4980	
YUKON-KUSKOKWIM DELTA		
SOUTH COAST		
Eek	257	nd
Kipnuk	408	*
Kongiganak	291	nd
Kwigillingok	244	nd
Tuntutuliak	293	nd
TOTAL	1493	
ADDITIONAL SOUTH COAST		
Goodnews Bay	241	*
Platinum	65	*
Quinhagak	453	16
TOTAL	759	
MID COAST		
Chefornak	277	*
Chevak	532	*
Hooper Bay	686	*
Mekoryuk	152	--
Newtok	207	*
Nightmute	153	*
Scammon Bay	304	*
Toksook Bay	362	*
Tununak	318	
TOTAL	2991	
NORTH COAST		
Alakanuk	556	--
Emmonak	613	--
Kotlik	409	--
Sheldon Point	124	--
TOTAL	1702	

Table 2. (continued)

	1985 COMMUNITY POPULATION	ESTIMATED OR DOCUMENTED HARVEST
UPPER COOK INLET		
Western Susitna	165	0
Tyonek	269	0
TOTAL	434	
SEWARD-NORTON SOUND		
Balance of Nome Census area	122	nd *
Brevig Mission	165	
Elim	237	nd
Golovin	131	nd
Koyuk	202	nd
Nome	3236	nd
Port Clarence	39	nd
Saint Michael	287	nd
Shaktoolik	163	nd
Shishmaref	410	nd 8
Stebbins	372	
Teller	247	nd
Unalakleet	759	nd *
Wales	143	
White Mountain	164	nd
TOTAL	6677	
BERING STRAITS		
Diomedede	158	*
Gambell	494	nd *
Savoonga	487	
TOTAL	1139	
URBAN PLACES		
JUNEAU	26270	nd

Table 2. (continued)

	1985 COMMUNITY POPULATION	ESTIMATED OR DOCUMENTED HARVEST
KETCHIKAN AREA		
Balance of Ketchikan Census Area	850	nd
Ketchikan	11125	mm
TOTAL	11975	
ANCHORAGE	235269	nd
MATANUSKA-SUSITNA VALLEY		
Palmer	3016	mm
Wasilla	3666	--
PRINCE WILLIAM SOUND		
Valdez	3271	--
Whittier	344	--
TOTAL	3615	
UPPER KENAI PENINSULA		
Anchor Point	327	
Bal. of Kenai-Cook Inlet Census SA	12821	nd
Bal. of Seward Census SA	303	nd
Clam Gulch	160	--
Cooper Landing	386	
Fritz Creek Census Designated Place	1610	
Halibut Cove	52	--
Homer	3632	0
Hope	224	--
Jakolof Bay Census Designated Place	81	--
Kachemak City	338	
Kalifonsky Census Designated Place	332	--
Kasilof	643	--
Kenai	6518	0
Moose Pass	145	--
Nikishka	1630	--
Ninilchik	451	0
Salamatof Census Designated Place	737	--
Seward	2152	*
Soldotna	3818	--
Sterling	1732	--
TOTAL	38092	

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