DISTRIBUTION OF MARINE MAMMALS IN THE COASTAL ZONE OF THE BERING SEA DURING SUMMER AND AUTUMN

by

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. Summary

A study was conducted with the objectives of compiling all available sightings of marine mammals in the coastal zone of the eastern Bering Sea during summer and autumn and evaluating the importance of coastal areas to the various species. Specific attention was given to identification of terrestrial hauling areas used by pinnipeds, and bays, lagoons, and estuaries utilized by cetaceans. The study area included the mainland coast, as well as major offshore islands, but did not include the Aleutian Islands.

Based on available sightings, it was possible to identify in general terms the areas of greatest importance to marine mammals, as well as to examine some aspects of seasonal distribution and abundance in specific areas. Although marine mammals inhabit the entire coastal zone of the eastern Bering Sea during summer and autumn, their distribution is far from uniform. Sea otters occur principally along the southwestern portion of the Alaska Peninsula, with a few animals on the Pribilof Islands. Steller sea lions haul out on most offshore islands and along rocky portions of the mainland coast in northwestern Bristol Bay. The only presently active breeding rookeries are at Sea Lion Rocks near Amak Island and Walrus Island in the Pribilof Islands. Major haulouts for walruses are at Cape Seniavin and Round Island in Bristol Bay, and at the Punuk Islands, St. Lawrence Island, King Island, and Big Diomede Island in the northern Bering Sea. Most Bering Sea harbor seals haul out at several locations along the north side of the Alaska Peninsula. Harbor seals and spotted seals mix in northern Bristol Bay and portions of the Kuskokwim Delta. Major haulouts in those regions occur at Nanvak Bay and in Kuskokwim Bay. Spotted seal hauling areas occur on St. Matthew Island, Hall Island, St. Lawrence Island, Golovnin Bay, and Port Clarence. Gray whales migrate through the entire coastal zone of Bristol Bay, pass along the south and west sides of Nunivak Island, and occur commonly near St. Lawrence Island. Major concentration areas for belukhas occur in Kvichak, Nushagak, Golovnin, and Norton bays and off the mouths of the Yukon River. Harbor porpoises are occasionally seen along the entire mainland coast, with several recent records from Norton Sound. Minke whale sightings have occurred primarily off the Alaska Peninsula, Nunivak Island, and Golovnin Bay. We located only one sighting of a killer whale in the coastal zone.

Available data indicate substantial fluctuations in numbers of animals at particular locations but are not adequate to measure those fluctuations or explain their causes. We suggest that OCSEAP initiate studies on representative species and areas in order that the effects of OCS activities on marine mammals in the coastal zone can be rigorously evaluated.

II. Introduction

Approximately 26 species of marine mammals are known to occur with some regularity in the Bering Sea. Included are eight species of pinnipeds, eight mysticete cetaceans, eight odontocete cetaceans, and two carnivores (Fay 1974, Lowry et al. 1982b). While a number of species such as several of the ice-associated pinnipeds and the oceanic cetaceans are seldom if ever seen near shore, several others regularly utilize coastal habitats. During summer and autumn when the coastal zone is ice free, 10 species may be common components of the nearshore fauna. They are:

Steller sea lion, Eumetopias jubatus
Harbor seal, Phoca vitulina richardsi
Spotted seal, Phoca largha
Walrus, Odobenus rosmarus divergens
Belukha whale, Delphinapterus leucas
Harbor porpoise, Phocoena phocoena
Killer whale, Orcinus orca
Minke whale, Balaenoptera acutorostrata
Gray whale, Eschrichtius robustus
Sea otter, Enhydra lutris

Fur seals (Callorhinus ursinus), which haul out almost exclusively on the Pribilof Islands, were not included in this study.

While in the coastal zone, all of the above species forage on the abundant food resources available in nearshore waters. In addition, seals, sea lions, walruses, and sometimes sea otters commonly haul out at specific coastal locations. For walruses, coastal haulouts appear to be important principally as a place to rest between feeding forays, while harbor seals and sea lions give birth, care for, and nurture their young, and molt on land.

While major features of the distribution and biology of these species are well known (e.g., Lowry et al. 1982b), specific published information on their utilization of coastal waters of the Bering Sea is generally not available. Proposed OCS leases will offer for sale much of the area adjacent to important coastal marine habitats in the Bering Sea. Potential effects of OCS exploration, development, and production activities on marine mammals include not only chronic and catastrophic discharge of hydrocarbons into the environment, but also disturbance factors associated with both onshore and offshore activities. Information on the distribution of marine mammals in the coastal zone must be of adequate resolution to provide input for tract selections, selection of onshore facilities sites, designation of transportation corridors, and design of stipulations relating to the nature and timing of activities. In addition, such information is required in order to evaluate "normal" changes in the distribution and numbers of marine mammals in coastal areas, as well as to monitor the future impacts of OCS activities.

This project has included two major components. The first involved field work, designed to increase the data available on distribution and food habits of marine mammals along the western coast of Alaska. Included were shipboard and aerial surveys and collections of animals conducted during May to October 1981. Results of the field studies have been compiled and reported (Lowry et al. 1982a). The second component consisted of a compilation of all available data on distribution and abundance of marine mammals in the coastal zone of western Alaska during summer and autumn. The compilation of distributional information is being prepared in two parts: this report, which covers the Bering Sea, and a second report covering the Chukchi Sea coast, which is in preparation and will be completed by the end of 1982.

III. Current State of Knowledge

A. Steller Sea Lion

Steller sea lions are gregarious, highly mobile pinnipeds and are the largest and most widely distributed otariids in the North Pacific Ocean. Their breeding range in Alaska includes the Pribilof, Walrus, and Aleutian Islands (including Amak Island and Sea Lion Rocks) and various locations throughout the Gulf of Alaska south to the Canadian border (Scheffer 1958, Mathisen 1959, King 1964). Seasonal movements of sea lions in the Bering Sea have not been well documented. There appears to be a late summer movement of adult and subadult males toward Bering Strait, although no breeding areas are found that far north (Kenyon and Rice 1961). Some animals from the Pribilof and perhaps Aleutian Islands move to the ice edge in the central Bering Sea during winter.

Sea lions are polygynous and gather annually at traditional rookeries to pup and breed (Pitcher and Calkins 1981). The largest, fittest males hold territories and defend harems of females. Females give birth to a single pup in mid-May to mid-July and breed shortly thereafter, in late May to mid- or late July (Pitcher and Calkins 1981). Steller sea lions begin concentrating at rookeries in mid-May, and numbers continue to increase until mid- to late June (Calkins and Pitcher 1982). The animals remain on the rookeries until autumn. Some other areas are used as haulouts on a regular and predictable basis during the remainder of the year. In this report, "rookery" will refer to an area where sea lions haul out to give birth and breed. Other areas used for resting or molting are referred to as haulouts.

The distribution of sea lions along the Bering Sea coast of Alaska is better documented than for most species, largely because of their tendency to haul out on land in large conspicuous groups. Their general distribution in the North Pacific and Alaska has been described by Scheffer (1958), King (1964), and Schusterman (1981). King noted a single breeding colony in the Pribilofs on Walrus Island and stated

that the center of abundance for the species was the Aleutian Islands. Murie (1959) summarized the distribution of Steller sea lions in Alaska and mentioned Amak Island as a major haulout. Mathisen (1959) and Mathisen and Lopp (1963) presented the results of aerial surveys flown in 1956, 1957, and 1958. Only two hauling areas, Cape Newenham (250 sea lions present in June 1956) and Twin Island (300 sea lions), were reported in northern Bristol Bay. Counts at Amak Island ranged from 253 (July-August 1956) to 3,016 (June 1957) and at Sea Lion Rock from 2,775 (December 1958) to 5,118 (August-October 1958).

Kenyon and Rice (1961) conducted an extensive survey of sea lions in the eastern Bering Sea from Bering Strait to and including the Aleutian Islands. They noted a northward movement of males during summer, with animals appearing and hauling out at St. Matthew and Hall islands (several hundred after mid-July); St. Lawrence Island (regular visitors in variable numbers, mostly at Southwest Cape and the Punuk Islands, from late June to November); Nunivak Island (spring and especially summer on the west side); and the Diomede Islands (few, irregular visitors in late summer and early autumn). On surveys in February and March 1960, they saw no sea lions at those areas. Kenyon and Rice counted 1,000 sea lions at Otter Island in the Pribilofs in April 1955 and 75-160 adult and subadult males there in summer. Residents of the Pribilofs told them that "large numbers" are present on Otter Island during winter. They also summarized the observations of others as follows: St. Paul Island and Sea Lion Rock, 300 (Kenyon 1960, field notes); Otter Island, 160 (Kenyon 1960, field notes); Walrus Island, 4,000-5,000 (Kenyon 1960, field notes); and St. George Island, 1,200 (L. Riley 1960, field notes). They also reported sea lions hauled out at the Twins in northern Bristol Bay (400 in late April, 66 in late June). The largest number of animals was seen on Unimak Island (4,200) and Amak Island/Sea Lion Rock (2,350). Kenyon and Rice (1961) estimated the entire Steller sea lion population from California to Alaska, including the Kuril Islands, Kamchatka, the Sea of Okhotsk, and Sakhalin, at 240,000-300,000.

Kenyon (1962a) reviewed the past and present distribution of sea lions in the Pribilof Islands and estimated that the population in 1960 was 5,700-6,700 (excluding pups) or approximately half of what it was in 1867. In the 1700's and 1800's, there were at least four breeding rookeries in the Pribilofs, including two on St. George, one on St. Paul, and one on Walrus Island. Although those sites continue to be used as haulout sites, Kenyon reported that only Walrus Island is still a breeding ground, with 4,000-5,000 adults and approximately 3,000 pups in 1960. He reported Otter Island as a regular winter hauling ground and Sea Lion Rock as a summer haulout for 200-500 nonbreeding animals.

Kenyon and King (1965), as an appendix to their report on aerial surveys for sea otters in April-May 1965, reported the numbers of sea lions observed in the Aleutians and along the Alaska Peninsula. They counted 810 sea lions on Unimak Island and 4,100 on Amak and Sea Lion Rock.

Braham et al. (1977a) presented the results of over 4.300 km of aerial survey conducted in 1975-76 from Cape Newenham to Unimak Island and in the eastern Aleutians. They found that 80% of the observed sea lions were in the eastern Aleutians, with most of the remaining 20% on Amak Island/Sea Lion Rock. Numbers on Amak ranged from 905 (October 1976) to 2,316 (August 1975), on Sea Lion Rock from 1,836 (October 1976) to 2,331 (August 1976), and on the unnamed rock between the two from 108 (June 1975) to 355 (August 1976). A few sea lions were seen in northern Bristol Bay: 30-50 on the Twins and 250-325 on Round Island in summer 1975. They counted only 60-70% as many animals hauled out in October as in June and August.

Braham et al. (1977b, 1980) compared population estimates from the eastern Aleutians and Amak/Sea Lion Rock in the mid-1970's to estimates from the late 1950's, using the same data presented in Braham et al. (1977a) plus additional survey counts from June 1977. They estimated a population decline of approximately 50%, from about 45,000 in 1957 to less than 25,000 in 1975-77.

B. Harbor Seal

The Pacific harbor seal is found in coastal waters of Alaska north to approximately 60°N in the Bering Sea, along the Aleutian Island chain, and on the Pribilof Islands (Scheffer 1958; Shaughnessy and Fay 1977; Burns and Gol'tsev, in press). In the eastern Bering Sea they are found along the Alaska Peninsula, in Bristol Bay and Kuskokwim Bay, and around Nunivak Island (Burns 1970, Shaughnessy and Fay 1977). Harbor seals are normally considered relatively sedentary and non-migratory (Bigg 1981), although studies by Pitcher and McAllister (1981) have shown movements of up to 194 km across 74 km of open ocean in the Gulf of Alaska. Seasonal occurrence in northern areas such as Bristol Bay and Nunivak Island also indicates substantial seasonal movement. Harbor seals haul out on rocks, sandbars, or reefs, sometimes in very large numbers, where they rest, molt, and care for their young. Local movements are made in conjunction with feeding and breeding (Bigg 1981).

There is little specific information on the distribution or abundance of harbor seals in the Bering Sea. Mathisen and Lopp (1963) presented minimum counts of harbor seals at Port Heiden and Port Moller for July-August 1956 and December 1957. Kenyon (1960a) surveyed the eastern Aleutians in March 1960 and counted 550 harbor seals on Unimak Island and 13 on Amak Island. Kenyon and King (1965) attempted to count harbor seals as well as sea otters on their April-May 1965 surveys of the Aleutians and Alaska Peninsula. On 21 April and 8 May they estimated that they saw 1,500 harbor seals on a sandbar at the mouth of Bechevin Bay, and on 19 April and 8 May they saw approximately 350 seals on sandbars near the mouth of Izembek Lagoon. They cited C. P. McRoy (pers. commun.) as estimating the seal population of Izembek Lagoon to number about 600 to 700 animals. Braham et al. (1977a) and

Everitt and Braham (1980) reported aerial survey counts for June 1975-77 and August 1975-76 for harbor seals along the northern Bristol Bay coast, the north side of the Alaska Peninsula (including Unimak Island), and the eastern Aleutian Islands. They found no consistently used hauling-out areas in northern Bristol Bay, although 20-200 seals were seen at Hagemeister Island in July and August 1975. Along the Alaska Peninsula they reported eight major hauling grounds: Egegik Bay, Ugashik Bay, Cinder River, Port Heiden, Seal Islands, Port Moller, Izembek Lagoon, and the Isanotski Islands in Bechevin Bay. In addition, a few seals were seen at Cape Seniavin, Cape Leiskof, Amak Island, and Unimak Island. Aerial counts ranged from about 6,000 (August 1975) to 25,000 (June 1976), and Everitt and Braham considered 25,000 as a minimum estimate of the number of harbor seals on the north side of the Peninsula.

The harbor seal population in Bristol Bay (including the Alaska Peninsula) has been estimated at 30,000 (Interagency Task Group 1978, NOAA 1979).

C. Spotted Seal

Published information on the distribution of spotted seals is limited to general descriptive accounts of their overall distribution (Scheffer 1958, King 1964, Shaughnessy and Fay 1977, Bigg 1981) or of their distribution in the Bering Sea ice front in spring (Burns 1970; Fay 1974; Burns and Harbo 1977; Burns et al. 1980; Braham et al., in press a). In late winter and spring, the entire Bering-Chukchi population is concentrated in or near the ice front (Burns and Harbo 1977, Burns 1978), with major pupping and breeding concentrations in the Bristol Bay-Pribilof Islands region, Karaginski Bay, and the Gulf of Anadyr (Shaughnessy and Fay 1977). As the sea ice disintegrates and recedes in spring, spotted seals move generally northward and toward the coast. During summer, they are common along the eastern Bering and Chukchi sea coasts, where they haul out on land. A few animals move eastward into the Beaufort Sea (Burns 1978). In autumn and early winter, as shorefast ice begins to form, spotted seals move offshore to the edge of the pack ice (Fay 1974).

The population of spotted seals in the Bering-Chukchi region has been estimated at 280,000-300,000, of which 80,000 occur in Karaginski Bay (Burns 1978).

D. Pacific Walrus

Pacific walruses inhabit the broad continental shelf of the Bering and Chukchi seas. They migrate seasonally from wintering areas in the Bering Sea to summering grounds on the coast of the Bering and Chukchi seas and the Chukchi Sea ice edge. Based on observations conducted from 1960 to 1976, there are two areas of concentration in late winter

and early spring, one south and west of St. Lawrence Island and the other in Bristol Bay (Fay 1982). The actual location of these concentrations is somewhat dependent on the extent of ice in the Bering Sea, which the animals use as a resting platform when not engaged in other activities such as feeding and breeding. Mating occurs in February-March, and females give birth in April-May while moving north with the receding ice edge. Much of the population migrates northward through Bering Strait in April and May. Subadults and females with young follow the retreating ice edge northward and summer primarily in the northern Chukchi Sea (Estes and Gilbert 1978). Adult males form large herds on hauling grounds in Bristol Bay, Bering Strait, and along the Chukchi Peninsula.

Most aerial surveys of walruses have been conducted over the pack ice in Bering Sea in spring or over the Chukchi Sea ice edge and coastal rookeries along the Chukchi Peninsula in late summer-early autumn. Thus, although there are numerous accounts of winter-spring distribution in the offshore Bering Sea (e.g., Kenyon 1960b, Kenyon 1972, Burns and Harbo 1977, Krogman et al. 1979) or summer-autumn distribution in the Chukchi Sea (e.g., Fedoseev 1962, Gol'tsev 1972), there are few systematic published reports of distribution along the Bering Sea coast of western Alaska in summer and autumn. Most information is in the form of scattered sightings reported in field notes or appendices to aerial surveys for other species. The best synoptic overview of walrus distribution in Alaska is provided by Fay (1982), in which he maps and discusses distribution by month.

Brooks (1954a) reported sightings of walruses hauled out on the Walrus Islands (Round, High, and Big Twin islands). Fay (1957) summarized the historical and present status of walruses and noted that at the time of writing no walruses had been recently seen on the north coast of the Alaska Peninsula. He stated that there were no regularly frequented hauling grounds in Alaska except for the Walrus Islands, which were used at that time by about 1,000 walruses. Occasional strays had been reported from the Pribilof Islands in winter.

Kenyon (1958) estimated that 1,500-2,000 adult and subadult male walruses were using Round Island in June 1958. No walruses were seen on the Twins, Black Rock, or Crooked Island.

Murie (1959) summarized historical accounts of walruses in the Aleutian Islands and Bristol Bay. He reported that walruses were historically present on "Walrus Island" in Izembek Lagoon, as well as on several other small islands near the mouth of that lagoon, on Amak Island, and on the north side of Unimak Island. King (1964) noted that walruses were present on the Pribilofs around the turn of the century. Kenyon and King (1965) reported sightings of 100 adult males on the east shore of Amak Island in April 1962 and of five males on the southwest shore in May 1965. They saw 75 males approximately 1 km off Cape Glazenap (near the mouth of Izembek Lagoon) in May 1965.

Burns (1965) listed the following islands as historical hauling areas for walruses: Amak, Walrus, the Pribilofs, Hall, St. Matthew, St. Lawrence, the Punuks, Besboro, and the Diomedes. He described reports of hauled-out walruses in the early 1960's from Cape Constantine (one bull, July 1963), Besboro Island (200 adult and subadult males, August 1961), the Punuk Islands (1,000 in October 1962, 20-25 in October and early November 1963), Southeast Cape on St. Lawrence Island (November 1963), and Cape Prince of Wales (one subadult male, July 1963) and noted haulout areas were usually on rocky gravel beaches near high promontories of islands or at the base of headlands projecting into the sea.

Fay and Kelly (1980) reported on the high natural mortality of walruses on St. Lawrence Island in autumn 1978. They reported that unusually large numbers of walruses had hauled out on the Punuks and St. Lawrence Island in October and November of that year. In addition to the traditionally used haulouts on the Punuks and on the northwest end of St. Lawrence Island near Gambell, four other areas were used for the first time in 40-50 years. Estimated numbers hauled out were 19,000 at Salghat, 35,000 at Maknik, 37,000 at Kialegak (all on St. Lawrence Island), and 50-60,000 on the three Punuk Islands. Fay and Kelly also commented that since the late 1960's thousands of walruses have been hauling out on the Diomedes, King Island, and Arakamchechen Island.

Fay and Lowry (1981) conducted monthly aerial surveys from April 1980 to May 1981 to determine the seasonal distribution of walruses in Bristol Bay. They noted that, although walruses occasionally haul out at Amak Island, Deer Island (in Port Moller), Cape Seniavin, Cape Constantine, and Cape Newenham, Round Island is the only haulout used throughout the entire summer. In recent years, 12,000-15,000 bulls have hauled out there, resting for 1-6 days, then leaving the island for 2-18 days, presumably to feed. During their 1980-81 surveys, Fay and Lowry counted from 40 (February 1981) to 9,700 (August 1980) walruses on Round Island. They summarized other recent reports of walrus hauling areas along the Alaska Peninsula. Those included the Ugashik Bay-Cinder River area, Port Heiden, Port Moller, and Cape Seniavin.

E. Belukha Whale

Belukha whales are widely though not uniformly distributed throughout seasonally ice-covered waters of Alaska. They spend the winter in offshore waters associated with drifting ice. In spring, as soon as the ice begins to break up and move offshore, they move toward the coast, some making extensive northward migrations in excess of 2,000 km, while others move relatively short distances. Most belukhas appear to spend the summer in coastal waters, concentrating in shallow bays or estuaries of large rivers, although an unknown proportion may remain associated with offshore pack ice. In late summer to late autumn, they move generally south and away from the coast, ahead of or with the advancing pack ice (Kleinenberg et al. 1964, Fay 1974, Gurevich

1980, Seaman and Burns 1981). Major summer concentrations in the Bering Sea occur in Bristol Bay, particularly in the Nushagak and Kvichak River systems (Brooks 1954b, Klinkhart 1966), in Norton Sound, and off the mouths of the Yukon River (Fay 1974, Seaman and Burns 1981).

General accounts of the distribution of belukhas in Alaskan waters have been presented by Nelson (1887), Gurevich (1980), and Seaman and Burns (1981). Nelson found belukhas to be common summer residents from Bristol Bay north to Point Barrow. He considered them to be migratory over most of their range, moving north in spring as the ice melted and receded and south in autumn as the pack ice advanced. Seaman and Burns summarized the distribution of belukhas by 2-month intervals and also concluded that most belukhas winter in the drifting ice of the Bering Sea, move northward and toward the coast in spring and summer, and leave the coastal zone in late summer to late autumn.

Brooks (1954b, 1955, 1956) conducted studies on the distribution, movements, and feeding of belukhas in inner Bristol Bay. Based on surface observations, aerial observations, and interviews with fishermen, he estimated the numbers of belukhas in Kvichak and Nushagak bays during May through August. In 1954 he estimated a total of 1,000 belukhas in both bays combined and in 1955 a total of 525. Lensink (1961) summarized Brooks' work and added information for areas north of Bristol Bay. He reported the average breakup and freeze-up dates for Kuskokwim Bay, Hooper Bay, Norton Sound, Kotzebue Sound, and Bering Strait and suggested that belukhas were probably present in those areas during the ice-free period. Daily movements of 36-55 km up the Kvichak River were described, as well as movements between Kvichak and Nushagak bays. Fish and Vania (1971) described similar movements in the Kvichak River.

Braham et al. (1977c, in press b) plotted more than 400 sightings of a total of almost 2,000 belukhas. Many sightings were made in conjunction with spring bowhead whale surveys from Point Hope to just east of Point Barrow. In addition, they reported April sightings from eastern and southern Bristol Bay and around St. Lawrence Island, St. Matthew Island, and northeastern Norton Sound. June and August sightings were made in southwestern and western Norton Sound.

Harrison and Hall (1978) presented results from 80,000 km of aerial survey tracklines, 28,000 km of which were in the Bering Sea. They observed belukhas in summer and autumn in Norton Sound near the mouths of the Yukon River, in Bristol Bay, and offshore in the vicinity of the Pribilof Islands. Winter sightings were numerous in the northern part of Bristol Bay.

Ljungblad et al. (1981, 1982) reported the results of aerial surveys for endangered whales in the northern Bering, Chukchi, and Beaufort seas. In spring 1980 they made 284 sightings of 3,404 belukhas, 1,362 of which were seen from Norton Sound to Bering Strait area. Belukhas were sighted on five of eight flights (1,279 whales) in the Chirikof

Basin and two of four flights (83 whales) in Norton Sound. In 1981, belukhas were sighted in outer Norton Sound and throughout the Chirikof Basin in April, in western Norton Sound in May, and in southwestern Norton Sound in June and July.

F. Harbor Porpoise

Little information is available on the distribution of harbor porpoises in the Bering Sea. They have been recorded from the Pribilof Islands and the Aleutians (Murie 1959). Braham et al. (1977a) reported sightings from west of St. Paul Island, central Bristol Bay, and the eastern Aleutians. Harbor porpoises are found near the coast and generally in waters less than 20 m deep (Tomilin 1957, Leatherwood and Reeves 1978).

G. Killer Whale

There is very little published information on the distribution of killer whales in Alaska. Most records are of opportunistic sightings in conjunction with other marine mammal surveys. Dahlheim (1981) summarized the worldwide distribution of killer whales. She reported that they are apparently abundant off the Pribilof Islands and the Aleutian Islands chain. Murie (1959) noted that killer whales were common along the Alaska Peninsula and throughout the Aleutians, generally in small groups or alone, but occasionally as many as 25 in a group. The whales were often seen along the borders of kelp beds. Braham et al. (1977a) recorded killer whale sightings in Bristol Bay, on the north side of Unimak Island and in Unimak Pass, around the Pribilofs, and north of St. Lawrence Island. Killer whales are also seen near the Diomedes and King Island (Ivashin and Votrogov 1981a).

H. Minke Whale

Pacific minke whales are distributed widely in inshore waters, often within 160 km of the coast, as well as in the southern edge of seasonal pack ice (Omura and Sakiura 1956, Tomilin 1957). They are most abundant in the Aleutian Islands and off the Alaska coast from May to July. Some probably migrate south to winter off Washington and California, and some may remain year-round in the Bering Sea (Tomilin 1957, Ivashin and Votrogov 1981b). There is little specific information on the distribution of minke whales in the coastal waters of western Alaska. Kawamura (1975) stated that in June-July 1974 minkes were most often seen between Unalaska Island and the Pribilofs, in 100 m or less of water. Braham et al. (1977a) reported sightings of minkes south of St. George Island, in southwestern and western Bristol Bay, off the tip of the Alaska Peninsula, and in Unimak Pass. According to them, minkes are one of the four most commonly observed cetaceans in the Bering Sea.

1. Gray Whale

The eastern Pacific stock of gray whales winters in the warm coastal waters of Baja California and the southern Gulf of California. From late February to May, the whales begin a northward migration, following the coast closely and occasionally stopping to rest or feed (Pike 1962). They enter the Bering Sea through passes in the eastern Aleutian Islands, particularly Unimak Pass, in April and May and continue moving along the coast of Bristol Bay and southern Nunivak Island, then toward St. Lawrence Island where they arrive in May or June (Pike 1962, Braham et al. 1977a). A few gray whales have been sighted near the Pribilofs in June (Braham et al. 1977a). Upon reaching St. Lawrence Island, the whales disperse to spend the summer feeding in the shallow waters (usually less than 50-60 m deep) of the northern and western Bering Sea and the Chukchi Sea (Rice and Wolman 1971). In the central Bering Sea, gray whales are especially abundant around St. Lawrence Island and in the central Chirikof Basin (referred to as the "large kitchengarden" by the Soviets) (Nerini et al. 1980, Votrogov and Bogoslovskaya 1980, Zimushko and Ivashin 1980). Gray whales begin their southward migration in mid-October (Kuz'min and Berzin 1975). They pass through Unimak Pass between late October and early January, with peak movements from mid-November to mid-December, and arrive in Baja California mainly in December and January (Pike 1962, Rugh and Braham 1979, Rugh 1981).

The eastern Pacific gray whale population was once severely depleted by commercial whaling but has since recovered to near pre-exploitation levels (Scheffer 1976, Blokhin 1979, Rugh and Braham 1979). Ohsumi (1975) estimated an original population of about 15,000 and suggested that it declined to a low of 4,400 in 1875. By the early 1970's, the population had risen to an estimated 11,000 (Rice and Wolman 1971, Mitchell 1973). Recent aerial surveys and ground counts during the migration give estimates of 16,500 $\pm$ 2,900 (Reilly et al. 1980) to 18,500 (Herzing and Mate 1981).

The distribution and migration of gray whales has been described most completely by Pike (1962) and later by Rice and Wolman (1971). Pike noted that gray whales moved northward through Unimak Pass in late May and early June and were abundant around St. Lawrence Island during summer months. He knew of only one report in July 1958 of gray whales sighted from the Pribilofs and stated that otherwise during summer there were no records of these whales from the Alaska Peninsula to St. Lawrence Island, nor were any whales taken at the whaling station on Unimak Island. Citing F. H. Fay (pers. commun.), he noted that gray whales arrived off Gambell from the 11th to the 21st of May in 1950-1961 and were seen traveling and feeding close to the west shore of St. Lawrence Island in May-July 1952-54. Sightings of whales were made in the Chirikof Basin in July and August 1958 and off the east coast of St. Lawrence Island in July and August 1958 and 1959. Rice and Wolman (1971) summarized northward and southward migrations, noting that females generally migrated earlier than males and adults preceded

subadults. They reported that gray whales were abundant in the shallow waters of the northern and western Bering Sea from May to October but were very scarce in the eastern Bering Sea, probably because of the low biomass of benthos found there. In addition to the sighting from the Pribilofs reported by Pike, Rice and Wolman noted several sightings around St. George Island in the summers of 1965-68 and a sighting of four in Sarichef Strait between St. Matthew and Hall Islands in August 1960.

Ichihara (1958) reported that Japanese whalers working from June to September west of a line between Unimak Pass and St. Lawrence Island in water deeper than 50 m saw no gray whales. However, in August 1955 and July 1957 gray whales were seen west of St. Lawrence Island.

Hall (1979) monitored the gray whale migration through Unimak Pass in April-May 1977. He estimated that about 9,000 whales entered the Bering Sea through that pass. Few cow-calf pairs were observed.

Braham et al. (1977a) listed gray whale sightings from their 1976 surveys of the Bering Sea. Gray whales were observed in southern Bristol Bay and along the Alaska Peninsula in April, May, June, and August; near the Pribilofs in April-June; off the southeast and west end of St. Lawrence Island in June; and throughout the Chirikof Basin in June and August. Based on their sightings, Braham et al. proposed that gray whales move through Unimak Pass, remain close to shore along the Alaska Peninsula and the north coast of Bristol Bay, then head north and west toward St. Lawrence Island.

Harrison (1979) reported on the association of birds with feeding gray whales in June-October 1976. Feeding gray whales were present northeast of St. Lawrence Island, north of Gambell, and west of King Island.

Rugh and Braham (1979) and Rugh (1981) reported on the migration of gray whales through Unimak Pass in November-December 1977. They estimated that 15,000 whales left the Bering Sea through this pass, with peak numbers on 22 and 23 November. The eastern shore was found to be the primary migratory corridor, with 71% of the whales passing within 815 m of shore.

Nerini et al. (1980) discussed the feeding areas of gray whales in the northern Bering Sea and summarized aerial and vessel sightings from 1975 to 1980. Gray whales were seen in May-October off the east and west ends of St. Lawrence Island, near Southeast Cape, north of Gambell, and throughout the Chirikof Basin. Sightings were uncommon in Norton Sound, although whales were observed in the inner sound in July, and one was seen south of Golovnin Bay in August.

Ljungblad et al. (1981, 1982) reported on surveys of endangered whales in the northern Bering Sea in spring through autumn 1980 and 1981. In May 1980, six gray whales were seen within 1 km of the beach

southeast of Nome. In autumn 1980, 254 gray whales were seen on six survey flights in the area between St. Lawrence Island, Nome, and Bering Strait. In May-August 1981, numerous gray whales were seen in the Chirikof Basin (381 on 14 flights) and a few south and southeast of St. Lawrence Island (13 on 2 flights). Whales were also seen in May near Cape Constantine, west of Cape Newenham in outer Kuskokwim Bay, and along the south side of Nunivak Island.

J. Sea Otter

Sea otters inhabit the nearshore North Pacific from California to the Aleutian Islands and southern Bristol Bay. They are seldom seen in waters deeper than 60 m. In the Bering Sea, sea otter habitat varies from rocky intertidal areas with dense macroalgal flora, such as much of the Aleutian Islands, to extensive shallow, offshore areas, such as are found off Unimak Island and in southern Bristol Bay (Kenyon 1969). Formation of sea ice in southern Bristol Bay can drastically affect distribution of sea otters in that area (Schneider and Faro 1975). Sea otters were heavily harvested until 1911, when they were protected by international treaty. The sea otter population in 1911 probably did not exceed a few thousand animals (Kenyon 1969). Since then the remnant population nuclei have grown and expanded, repopulating much of their former range in Alaska. Schneider (pers. commun. and unpubl. ms.) estimates 55,000 to 73,700 in the Aleutian Islands, 11,700 to 17,200 on the north side of the Alaska Peninsula, and 10 on the Pribilof Islands.

Lensink (1960) summarized the distribution and status of sea otters in Alaska based on boat and aerial surveys. He reported a group of 786 otters located 4-7 km from shore on the north side of Unimak Island between Cape Mordvinof and Bechevin Bay. No otters were observed near shore. Scattered small groups were seen off the west end of Unimak Island and near Cape Mordvinof in September 1957 and March 1958, but observers failed to resight the large offshore group. In September 1957, 40 sea otters were seen in the vicinity of Amak Island. Lensink estimated that 1,100-1,500 sea otters were present in the Fox Island area, including Unimak and Amak islands. He noted that 16 otters were transplanted to the Pribilofs in 1955, but none had apparently survived. An additional seven were released in 1959.

Kenyon (1960a) surveyed marine mammals in the eastern Aleutians in early March 1960. Only 90 otters were counted in the Unimak-Amak area, 82 of which were in the area east of Amak. Kenyon considered Lensink's (1960) estimate of 1,100-1,500 sea otters in that area to be reliable.

Kenyon and Spencer (1960) presented the results of their 1959 aerial, small-boat, and shore surveys for sea otters in the western Aleutian Islands. They also summarized and evaluated Lensink's 1957 surveys in other areas of Alaska and estimated the total Alaskan

population of otters at 20,000 to 30,000, of which 1,100 to 1,500 were in the Fox Islands (including Unimak Island). Attempts to transplant sea otters to the Pribilof Islands from Amchitka were summarized, and at the time of writing the 1959 transplant of seven animals was thought to be successful.

Kenyon (1962b) tabularized the best available data on sea otter populations and distribution in Alaska, mapped observations of otters, and summarized observations obtained on aerial surveys in March and April 1962. Based on 811 observed animals, he estimated the Unimak-Amak area population at 1,081-1,622 otters. He sighted otters 7-15 km north of Unimak Island near the 38-m depth curve and near Amak Island.

Lensink (1962) summarized the recovery of sea otters in Alaska. He reported otters from four locations east of Unimak Pass: Sennett Point, Cape Mordvinof, Otter Point, and near Amak Island. He estimated that 1,050-1,300 otters were present in the offshore areas of Unimak Island and 150-200 in the shoreline areas.

A very complete summary of the distribution of sea otters, their reduction through exploitation, and subsequent recovery is provided by Kenyon (1969). He noted that, in general, the prosperous sea otter colonies are located south of areas where sea ice forms regularly and remains for long periods of time. Kenyon reported otters observed and estimated total otters for the Unimak-Amak area as 811 and 1,081 in 1962, and 2,892 and 3,856 in 1965. In 1962 most otters were seen offshore near the 38-m depth curve. In 1965, most sightings (2,678) were within 6 km of the coast in the area between Amak Island and Bechevin Bay. No sea otters were seen east of Port Moller. In spring 1961, one or two sea otters were sighted in the Pribilof Islands and were presumably survivors of the 1959 transplant.

Schneider and Faro (1975) discussed the effects of sea ice on sea otters. They estimated that 8,000 to 10,000 sea otters inhabit the shallow waters north of Unimak Pass and the Alaska Peninsula, ranging at least 42 km offshore in up to 80-m water depth. They reported that since Kenyon's 1965 surveys the population had extended north as far as Port Heiden, with occasional sightings at least as far as Ugashik Bay. In 1971 and 1972, sea ice extended unusually far south and caused substantial mortality and displacement of sea otters. In 1971 there was a reduction in numbers but no change in the range of the population, whereas in 1972 there was little apparent mortality but a major, although probably temporary, change in distribution. Schneider and Faro attributed mortality to causes either directly or indirectly related to malnutrition. They suggested that the northeastward expansion of the population into Bristol Bay is probably being restricted by sea ice and that very few otters could survive an average winter northeast of Port Heiden.

Schneider (1976, 1981) conducted aerial surveys north of Unimak Island and the Alaska Peninsula in June and August 1975 and June and July 1976. He found the main range (which he considered critical

habitat) of sea otters there to lie from the shore to 60-m water depth between Cape Mordvinof and Cape Leiskof, including Bechevin Bay; smaller numbers were present in Izembek Lagoon, Moffet Lagoon, to the west of Cape Mordvinof, and to the northeast near Port Moller, sometimes as far as Ugashik and Egegik bays. In August 1975, 2,585 of the 2,605 sea otters counted were between Moffet Point and Otter Point. Some otters were found over 40 km from shore and in greater than 60 m of water, although the greatest densities on the dates he surveyed were in water depths of 0-20 m (3.1/km^2) and 20-40 m (5.8/km^2). Schneider identified two high-density areas (6.5/km^2) between Cape Mordvinof and Cape Leiskof which were located mostly within the 40-m contour and separated by a line from Amak Island to Cold Bay. Medium-density (0.3/km^2) areas were mostly between 40-m and 60-m water depth, and low-density (0.06/km^2) in water deeper than 60 m. Schneider believes that water depth, rather than shoreline configuration, influences sea otter distribution in the Unimak-Amak area. Otters in this region apparently move more than those along rocky coastal habitats and disperse widely in offshore areas. Most animals sighted in deep water were adult males, whereas females with pups and young animals preferred shallower water. Schneider's total population estimate for the Unimak-Amak population, based on the 1975 and 1976 surveys, was a minimum of 17,000 otters. He considered that number was probably below the 1970 level as a result of the cumulative effect of heavy ice years in 1971, 1972, and 1974. The heavy ice years also restricted the range of sea otters along the Alaska Peninsula to the area west of Cape Leontovich, whereas before 1970 they were common to Port Heiden, with occasional sightings east to Ugashik and Egegik bays.

Schneider (1981) also summarized the status of sea otters in the Pribilof Islands. He reported that of 55 animals transplanted to St. George Island in 1968 only six, none of which had pups, had been sighted in 1976. Scattered sightings of one or two otters were made at St. Paul and Otter islands in 1972-74. Schneider also reported occasional sightings from Nunivak Island, St. Lawrence Island, and Norton Sound but considered them as extralimital occurrences.

IV. Study Area

The principal emphasis of this study has been to document marine mammal utilization of coastal areas of western Alaska. This report covers information obtained for the eastern Bering Sea, which includes the Alaskan coast from Unimak Pass to Bering Strait. Several major islands in the Bering Sea are also important marine mammal habitats, and those, with the exception of the Aleutian Islands, were included as part of the study area.

The study area was divided into four major sub-areas which correspond to the U.S. Department of Interior Outer Continental Shelf planning

areas (Fig. 1). For purposes of cataloging information and for presentation of results, each planning area was divided into geographical regions, which are described in Table 1. Geographical coordinates of specific locations referred to are given in Appendix I.

Our intention in this report has been to include all sightings of relevance to marine mammal distribution in the coastal zone. While it is obvious that sightings of animals hauled out on land or in lagoons and estuaries are significant, the evaluation of sightings made at sea is less straightforward. We did not attempt to review and compile all of the available pelagic sighting data, but we did evaluate and include offshore sightings of particular significance. Generally speaking, all sightings made within 5 km of the coast have been included.

V. Methods

We have attempted to make a complete review of all available sightings of marine mammals in the coastal zone of the Bering Sea during summer and autumn. Our intention in restricting the study to the summer-autumn period was to eliminate the seasons when the coastal zone is covered by shorefast ice, which excludes most species of marine mammals. By so doing, we have eliminated from our study polar bears (Ursus maritimus), ringed seals (Phoca hispida), bearded seals (Erignathus barbatus), and ribbon seals (Phoca fasciata), which, in Alaska, only very rarely utilize terrestrial haulouts. We have included in this report any sightings of the 10 species listed in section II which occurred during the open-water season. In areas such as southern Bristol Bay, this includes virtually the entire calendar year.

As discussed in section IV, the study area has been limited to the coastal zone of the Bering Sea, including the major offshore islands but not including the Aleutian Islands. Emphasis was given to identification of terrestrial hauling areas of pinnipeds, and lagoons, bays, and estuaries regularly utilized by cetaceans and pinnipeds. Sea otters, although they may occur more than 60 km offshore, are a coastal species in the sense that their distribution is limited by water depth. Therefore, we have included all sightings of sea otters regardless of their proximity to the coast. We have not reviewed all available pelagic sightings of cetaceans and generally have included only sightings made within 5 km of the shore. We have dealt primarily with sightings made since 1950 and have not attempted a complete review of earlier historical information, since what is available is usually presented in general terms and is of anecdotal value. Reports and sightings of beached, dead animals have not usually been included.

The idea of cataloging sightings and information on distribution of Bering Sea mammals is not new. In fact, a number of investigators have maintained files of sightings, and we have benefited greatly from their efforts. Although some relevant information is contained in

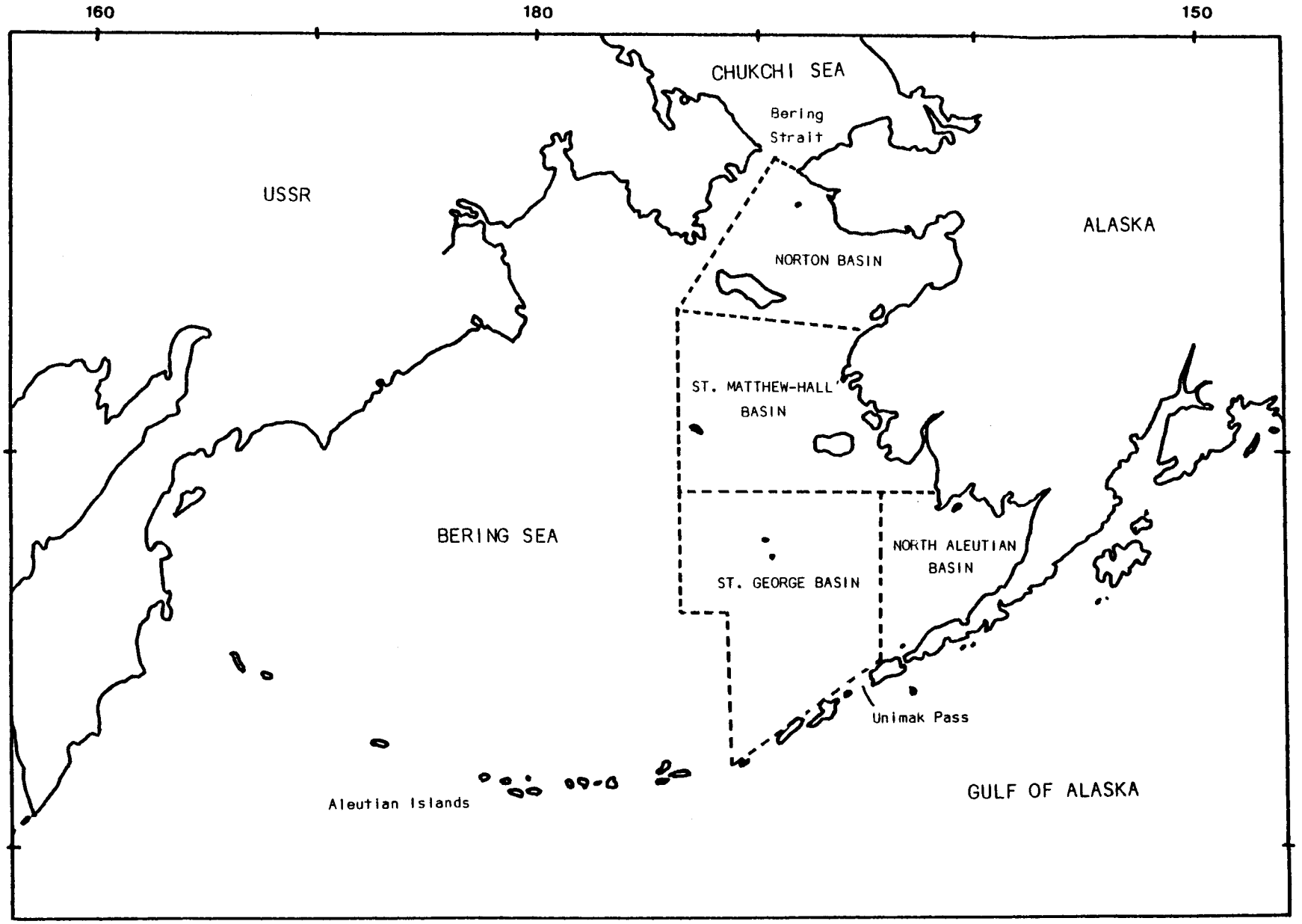

Figure 1. Map of the study area showing Outer Continental Shelf planning areas.

Table 1. Geographical subdivisions of the Bering Sea study area.

North Aleutian Basin

NAB 1 - north coast of the Alaska Peninsula from Unimak Pass to east of Cape Seniavin
NAB 2 - north coast of the Alaska Peninsula from east of Cape Seniavin to Cape Chichagof
NAB 3 - northeastern Bristol Bay from Cape Chichagof to west of the Nushagak Peninsula
NAB 4 - northwestern Bristol Bay from west of the Nushagak Peninsula to north of Cape Newenham

Saint George Basin

SGB 1 - the Pribilof Islands, including St. Paul, St. George, Otter, and Walrus islands

Saint Matthew - Hall Basin

SMH 1 - Kuskokwim Bay
SMH 2 - Nunivak Island
SMH 3 - mainland coast from east of Kipnuk to Pastol Bay
SMH 4 - Saint Matthew and Hall islands

Norton Basin

NB 1 - inner Norton Sound from Pastol Bay to east of Cape Darby, including Stuart, Egg, and Besboro islands
NB 2 - southern coast of the Seward Peninsula from east of Cape Darby to Cape Rodney, including Sledge Island
NB 3 - southwestern coast of the Seward Peninsula from Cape Rodney to Cape Prince of Wales
NB 4 - Saint Lawrence Island and the Punuk Islands
NB 5 - King Island
NB 6 - Diomede Islands and Fairway Rock

published literature (e.g., see section III), much of the specific information on sightings is usually lost in the process of data reduction. We have therefore, to the maximum extent possible, derived sighting information from original sources, which are usually the files of individual investigators or agencies and notes and observations of field biologists. Sources which we have used, in addition to published literature (section X), are given in Table 2. The observations and files of personnel associated with the U.S. Fish and Wildlife Service wildlife refuge system and with the Alaska Department of Fish and Game have been particularly useful. Dr. F. H. Fay (University of Alaska, Institute of Marine Science) contributed much from the wealth of data he has collected during many years of observing Alaskan marine mammals. We did not intensively review data collected on the Pribilof Islands by the National Marine Fisheries Service.

Data were recorded on formatted sighting cards, which were cataloged by species and area. Geographical subunits of the study area are shown and described in section IV. Depending on the specificity of the data source, we recorded for each sighting the species, number of animals, date, time, location, and any other significant observations such as sex/age classes, apparent behavior, etc.

We have presented our results principally in a series of tables in which sightings are ordered by species, location, and time of year. The location given to each sighting is generally the nearest recognized geographical locale. For example, sightings of both seals hauled out at and whales swimming by Cape Newenham are recorded as at Cape Newenham. Place names and associated geographical coordinates are from Orth (1971) and are listed in Appendix I. Some place names not in Orth (1971) are included in tables, maps, and Appendix I; latitudes and longitudes of those places were determined from 1:250,000 USGS maps. Acronyms for sources given in data tables are explained in Appendix II. We have indicated the source from which we obtained the data, which may not in all cases be the original observer. Sightings for a particular species and area are arranged by time of year to elucidate seasonal patterns in abundance.

Although the data-compilation phase of this project terminated at the end of calendar year 1981, new information has been regularly received during the course of preparation of the report. We have incorporated as much of this new information as possible; however, we do not consider the data included for the summer of 1982 to be complete.

Table 2. Information sources consulted in addition to published literature.

ADF&G (Alaska Department of Fish and Game) Annual Project Segment Reports - Federal Aid in Wildlife Restoration Projects, 1960-1981.

ADF&G Files - Anchorage, Bethel, Fairbanks, King Salmon, and Nome

ADF&G Herring Surveys - April-August 1967-1981, Bristol Bay to Cape Prince of Wales, aerial and boat surveys

ADF&G Marine Mammal Field Reports - cruise and aerial survey

ADF&G Marine Mammal Harvest Data

ADF&G Subsistence Division Reports

Alaska Maritime NWR (National Wildlife Refuge) - Annual Report 1981 and letter to refuge manager requesting any additional data from files

Alaska Peninsula NWR - Annual Report 1981 and letter to refuge manager requesting any additional data from files

Aleutian Islands NWR - Annual Reports 1955-1981

Arvey, W. - ADF&G, field notes

Barton, L. - ADF&G, field notes, herring surveys

Baxter, R. - ADF&G, field notes, herring surveys

Burns, J. - ADF&G, field notes 1962-1982

Calkins, D. - ADF&G, field notes 1975-1982

Cape Newenham NWR - Reports January 1966, April 1971; Annual Reports 1969-1971

Clarence Rhodes NWR - Annual Reports 1952, 1963-1971, 1976-78.

Divoky, G. - seabird biologist, sent letter of inquiry

Drury, W. - seabird biologist, sent letter of inquiry

Table 2., continued

Fay, F. - Institute Marine Science, Univ. Alaska, Fairbanks; terrestrial haulouts 1930's - 1980

Frost, K. - ADF&G, field notes 1975-1982

Izembek NWR - Annual Reports 1950-1981 and letter to refuge manager requesting any additional data from files

Johnson, B. and P. - ADF&G, field reports Nanvak Bay and Otter Island

Jonrowe, D. - ADF&G, field notes

Kelly, B. - Institute of Marine Science, Univ. Alaska, Fairbanks, and ADF&G; field notes 1977-1982

Lensink, C. - USFWS, pers. commun.

Lowry, L. - ADF&G, field notes 1975-1982

Lust, G. - ADF&G, field notes

Marks, S. - ADF&G, field notes

Nelson, R. - ADF&G, field notes, field reports

Nunivak Is. NWR - Annual Reports 1951, 1953, 1965-1971, 1978

Pitcher, K. - ADF&G, field notes, field reports

Seaman, G. - ADF&G, field notes, field reports

Stoker, S. - Univ. Alaska, Fairbanks; field notes, field reports

Table 2., continued

Taggart, J. and C. Zabel - ADF&G, field notes, field reports

Togiak NWR - Annual Report 1981 and letter to refuge manager requesting any additional data from files

USFWS (U.S. Fish and Wildlife Service) Aerial Surveys for Waterfowl -
- south side of Yukon-Kuskokwim Delta to Unimak; 23-27 April 1981; emperor goose survey; R. King
- Bethel to Bechevin Bay; 1-4 October 1979; waterfowl; R. Gill
- Bethel to Bechevin Bay; 4-8 October 1980; waterfowl; R. Gill and R. King
- Point Barrow to Dillingham; 15-22 September 1977; waterfowl; R. King

USFWS Seabird Colony Status Reports - files of all sightings/censuses/visits of established seabird colonies along entire Alaskan coast, usually only visited during breeding season

USFWS Shorebird Surveys - July-October 1977-1981, R. Gill and C. Handel, 11 flights, Baird Inlet to Hooper Bay

USFWS Walrus Harvest Reports - 1980 and 1981 from Diomede, Wales, Nome, Gambell, and Savoonga

USFWS Walrus Survey - joint project with ADF&G and Soviet Union, 10-23 September 1980, Barrow to Bristol Bay

Yukon Delta NWR - Annual Report 1981 and letter to refuge manager requesting any additional data from files

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VI. Results

A. North Aleutian Basin (Figures. 2-6; Tables 3-6)

Steller Sea Lion

Sea lions utilize three principal hauling areas on Unimak Island: Sea Lion Point/Cape Sarichef, Okseanof Point, and Cape Mordvinof. Sightings have occurred during March-August. In excess of 4,000 animals occurred there in March 1960. Surveys conducted in 1975-77 recorded less than 100 animals hauled out on the island.

Amak Island (including Sea Lion Rocks and the unnamed nearby rocks) is presently the largest sea lion haulout in Bristol Bay. Animals haul out there from at least early March until mid-October, with largest numbers probably in April to August. Reasonably complete counts of sea lions in the Amak/Sea Lion Rocks area have been made on 13 occasions from 1960 to 1981. Based on four counts conducted in June and three in October, the number of animals declined from a mean of 3,496 to 2,034 during that period. Two counts made in August indicate that peak numbers (mean 4,471) may occur during that month.

There are few other records of sea lion haulouts along the Alaska Peninsula. The northeasternmost recorded haulout occurs at Cape Seniavin.

Sea lions are common throughout northwestern Bristol Bay. Although they have been regularly sighted feeding near the coast between Estus Point and Kulukak Bay, we located no records of haulouts in that area. A similar situation exists in Security Cove. A significant haulout occurs in the Cape Peirce/Cape Newenham area. Several hundred animals occur there each year from at least May through September, with a probable peak in numbers in May. Sea lions also haul out on Hagemeister, High, Crooked, and Round islands and on the Twins. Animals have been seen on Round Island from at least April through November. Largest numbers appear to occur on South Twin Island (up to 300) and Round Island (400-500).

Harbor Seal

The principal reported harbor seal haulout on Unimak Island appears to be in the vicinity of Cape Lapin, where as many as 200 animals were reported in June 1967. Animals are more abundant to the east in the False Pass region (Cape Krenitzin and Isanotski Islands), where 1,500 were seen in April and May 1965 and July 1967. Major hauling areas along the southwestern portion of the Alaska Peninsula occur in the vicinity of Izembek Lagoon/Moffet Lagoon and Nelson Lagoon/Port Moller. Maximum counts at those two areas were 5,000 in late June 1975 at Izembek/Moffet and 7,968 in June 1976 at Port Moller. Small numbers of harbor seals haul out at Amak Island and at several locations along

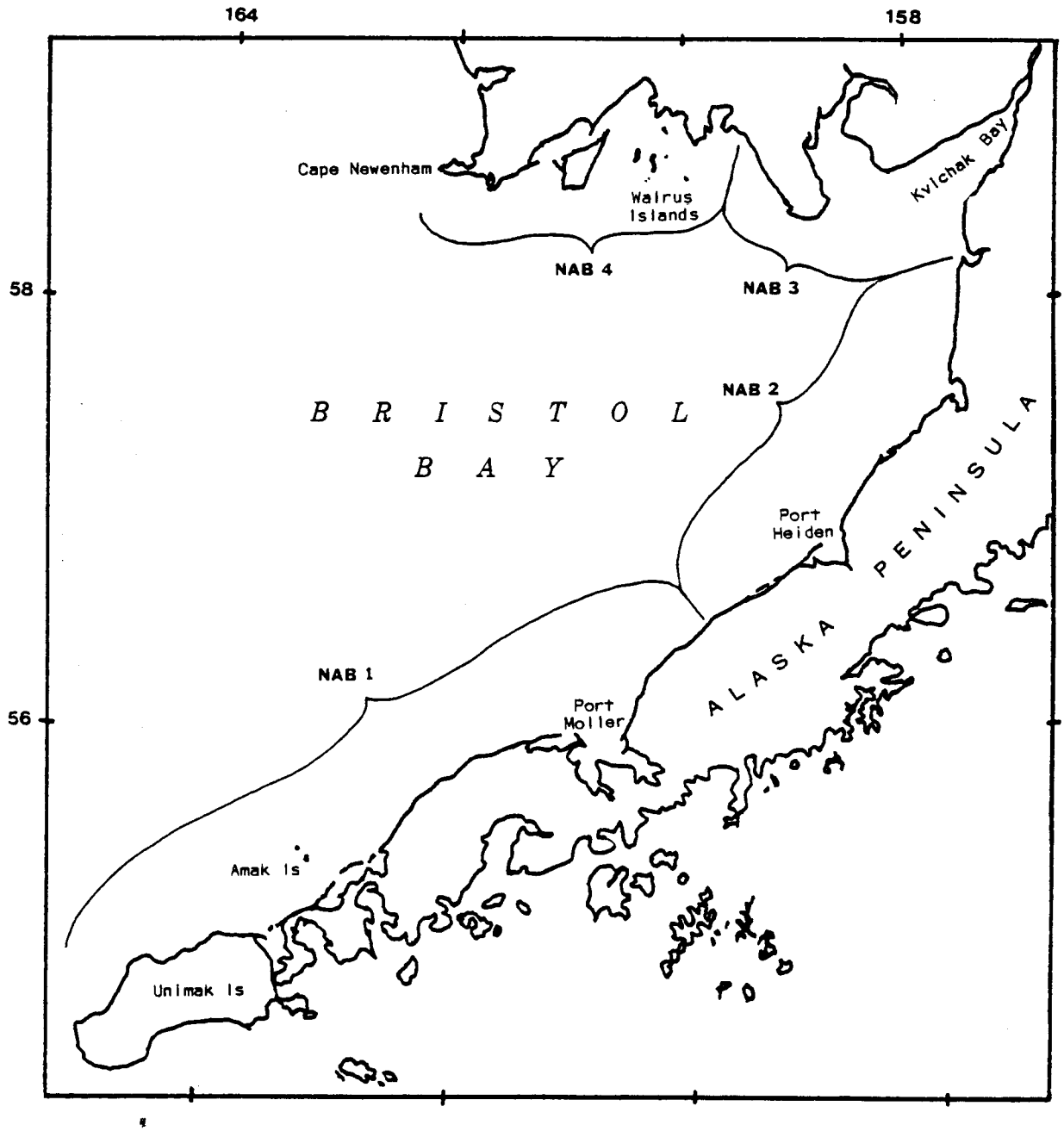

Figure 2. Map of the North Aleutian Basin planning area showing subdivisions used in data compilation.

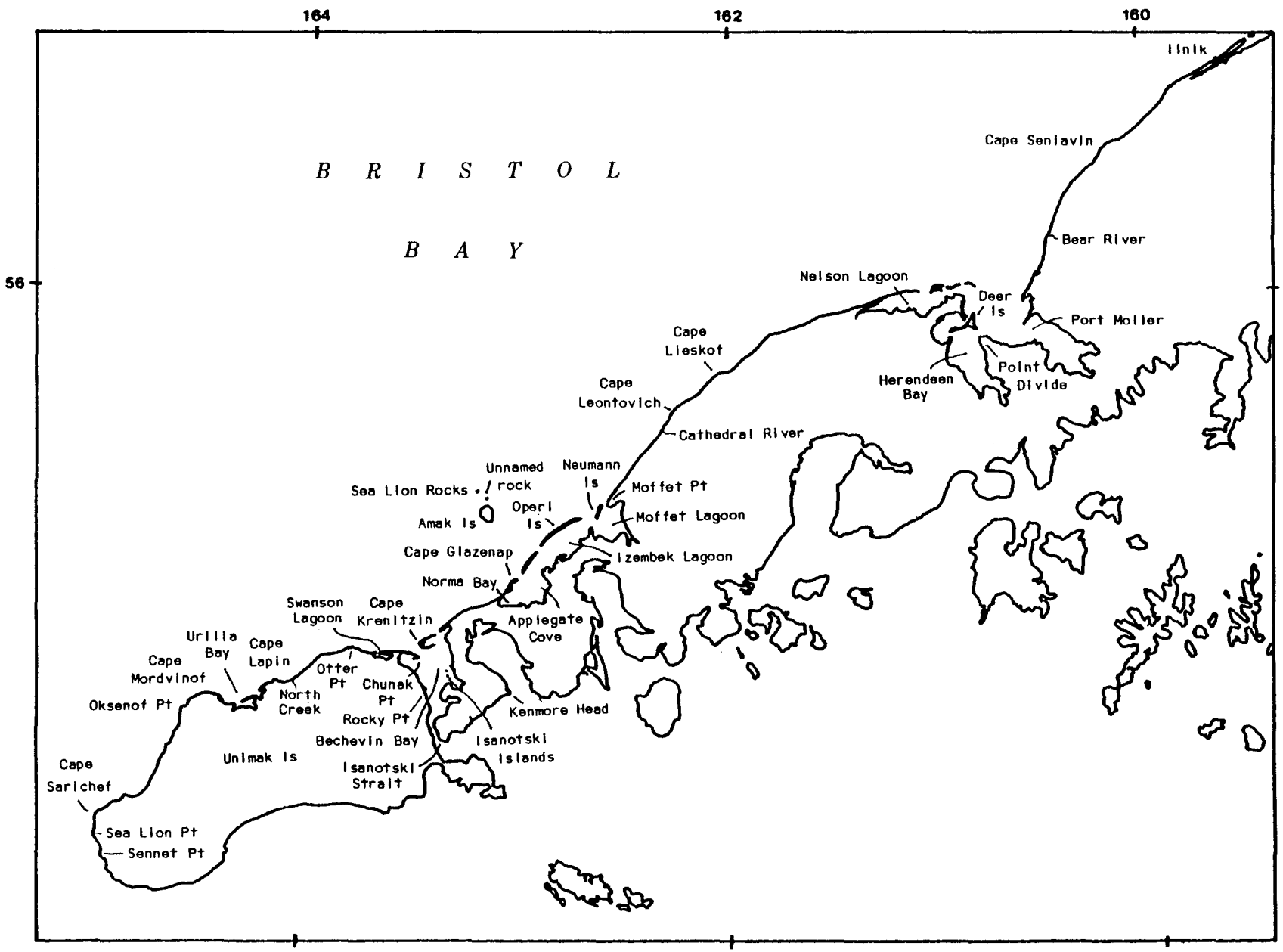

Figure 3. Map of the North Aleutian Basin, region NAB 1.

Table 3. Sightings of coastal marine mammals in the North Aleutian Basin, region NAB 1.

Location	Date	Number	Comments	Source
STELLER SEA LION				
Unimak Is., Sea Lion Pt. (S of Cape Sarichef)	general	present		USFWS/BB Manage. Plan Maps
	May 76	present	on rocks just offshore	USFWS/SBCS Rep.
	13 May 77	present	in water below cliffs	"
Unimak Is., Cape Sarichef	general	200	rookery, ADF&G #167	FEIS 1978
	3-4 Mar 60	200	hauled out; aerial survey	Kenyon and Rice 1961
Unimak Is., Oksenof Pt.	general	4,000	rookery, ADF&G #168	FEIS 1978
	general	present	hauled out	USFWS/BB Manage. Plan Maps
	3-4 Mar 60	4,000	hauled out; aerial survey	Kenyon and Rice 1961
Unimak Is., Cape Mordvinof	Mar 58	500	seen during otter surveys	Aleutian Is. NWR Rep., Jan-May 1958
Unimak Is. area	1960's	4,200		Kenyon and Rice 1961
Unimak Is.	8 Apr 62	630	aerial survey	Kenyon 1962b
	Apr-May 65	810	aerial survey for sea otters	Kenyon and King 1965
	Jun 75	63	hauled out; aerial survey; groups >20 counted from photos	Braham et al. 1980
	Jun 76	38	"	"
	Jun 77	11	"	"
	Aug 75	0	"	"
	Aug 76	39	"	"
Amak Is.	general	350	rookery, ADF&G #201	FEIS 1978
	general	present	hauled out	USFWS/BB Manage. Plan Maps
	3-4 Mar 60	350	hauled out; aerial survey	Kenyon and Rice 1961
	9 Mar 81	475		Izembek NWR files
Amak Is. (N side)	15 Mar 67	400-600		"
	8 Apr 62	2,000	aerial survey	Kenyon 1962b
Amak Is.	7 May 80	1,350		Izembek NWR files

Table 3., continued

Location	Date	Number	Comments	Source
STELLER SEA LION, cont.				
Amak Is., cont	28-30 Jun 57	3,016	aerial photo survey, no pups	Mathisen and Lopp 1963
	Jun 75	927	hauled out; aerial survey; groups >20 counted from photos	Braham et al. 1980
	Jun 76	1,777	"	"
	Jun 77	1,315	"	"
	6 Jun 80	2,400		Izembek NWR files
	2 Jul 80	1,045		"
	4-5 Jul 73	418		USFWS/SBCS Rep., V. Byrd/G. Divoky
	13 Jul 82	620-770	N side; aerial survey, estimate	K. Frost
	19 Jul 75	15	9 hauled out, 6 in water	USFWS/SBCS Rep.
	28 Jul - 9 Aug 56	253	aerial photo survey; 1 pup	Mathisen and Lopp 1963
	Aug 75	2,316	aerial survey; groups >20 counted from photos	Braham et al. 1980
	Aug 76	1,381	"	"
	6-14 Aug 57	570	aerial photo survey, 1 pup	Mathisen and Lopp 1963
	28 Aug - 2 Oct 57	683	aerial photo survey; 113 pups	"
	Oct 76	905	"	"
Amak Is. (NW end)	11 Oct 81	300	hauled out, subadult males; boat survey	J. Burns
Amak Is.	16 Oct 81	300	hauled out on large rocks at base of cliff; boat survey	K. Frost
	4 Dec 57	1,401	aerial photo survey; count includes pups	Mathisen and Lopp 1963
Amak Is. and Sea Lion Rocks area	early 1960's	2,350		Kenyon and Rice 1961
	Apr-May 65	4,100	aerial survey for sea otters	Kenyon and King 1965
Sea Lion Rocks	general	2,000	rookery, ADF&G #200	FEIS 1978
	general	present	hauled out	USFWS/BB Manage. Plan Maps

Table 3., continued

Location	Date	Number	Comments	Source
STELLER SEA LION, cont.				
Sea Lion Rocks, cont.	3-4 Mar 60	2,000	hauled out; aerial survey	Kenyon and Rice 1961
	9 Mar 81	575	plus several individuals and small groups in remainder of area	Izembek NWR files
	8 Apr 62	3,500	hauled out; aerial survey	J. Burns
	28-29 May 57	2,866	hauled out; aerial photocensus, 11 pups	Mathisen and Lopp 1963
	Jun 75	2,006	hauled out; aerial survey; groups >20 counted from photos	Braham et al. 1980
	Jun 76	1,944	"	"
	Jun 77	2,130	"	"
	6 Jun 80	900		Izembek NWR files
	28-30 Jun 57	3,100	aerial photocensus, 229 pups	Mathisen and Lopp 1963
	2 Jul 80	1,300		Izembek NWR files
	6 Jul 76	710		USFWS/SBCS Rep.
	13 Jul 82	1,150-1,350	aerial survey; visual estimate	K. Frost
	28 Jul - 9 Aug 56	4,815	aerial photocensus; 1,035 pups	Mathisen and Lopp 1963
	Aug 75	2,126	hauled out; aerial survey; groups >20 counted from photos	Braham et al. 1980
	Aug 76	2,331	"	"
	6-14 Aug 57	3,056	aerial photocensus; 169 pups	Mathisen and Lopp 1963
	Aug-Oct 57	5,118	aerial photocensus; 424 pups	"
	Oct 76	1,836	hauled out; aerial survey; groups >20 counted from photos	Braham et al. 1980
	11 Oct 81	1,500-1,600	all sizes and age classes present, including pups; boat survey	J. Burns
	16 Oct 81	1,100	all age groups present, including pups; boat survey	K. Frost
	4 Dec 57	2,775	aerial photocensus; count includes pups	Mathisen and Lopp 1963

Table 3., continued

Location	Date	Number	Comments	Source
STELLER SEA LION, cont.				
Amak Is., unnamed rock near Sea Lion Rocks	Jun 75	108	hauled out; aerial survey; groups >20 counted from photos	Braham et al. 1980
	Jun 76	132	"	"
	Jun 77	97	"	"
Amak Is., other small rocks	6 Jun 80	250		Izembek NWR files
	2 Jul 80	15		"
	13 Jul 82	200-250	hauled out; aerial survey	K. Frost
Amak Is., unnamed rock near Sea Lion Rocks	Aug 75	234	hauled out; aerial survey; groups >20 counted from photos	Braham et al. 1980
	Aug 76	355	"	"
	Oct 76	110	"	"
Izembek Lagoon, Neumann Is.	11 Jun 81	5		Izembek NWR files
Moffet Pt. to Nelson Lagoon	3 May 82	15		"
Cape Seniavin	12 Apr 81	6	hauled out on rock by beach	F. Fay, RESOLUTION cruise
HARBOR SEAL				
Unimak Is., Sea Lion Pt. (S of Cape Sarichef)	13 May 77	present	in water below cliffs	USFWS/SBCS Rep.
Unimak Is., Cape Lapin	26 May 76	40	hauled out on rocks; aerial survey	M. Dick
	23 Jun 67	200		Izembek NWR files
Unimak Is., North Creek (E of Cape Lapin)	26 Jul 67	70		"
Unimak Is.	3-4 Mar 60	550	aerial survey	Kenyon 1960a
	Jun 75	125	aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	5	"	"
	Jun 77	0	"	"
	Aug 75, 76	0	"	"
Bechvin Bay, mouth	21 Apr 65	1,500	hauled out on sandbar; aerial survey for sea otters	Kenyon and King 1965
Either Chunak Pt. or Cape Krenitzin	3 May 67	500-1,000	pilot report	Izembek NWR files

Table 3., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Bechevin Bay, mouth	8 May 65	1,500	hauled out on sandbar; aerial survey for sea otters	Kenyon and King 1965
Cape Krenitzin	19 Jul 67	1,500		Izembek NWR files
	17 Aug 67	500		"
Isanotski Islands	Jun 75	368	highest count recorded for month; aerial survey for sea lions; large groups counted from photos; offshore rocks and volcanic beaches	Everitt and Braham 1980
	Jun 76	99	"	"
	Jun 77	422	"	"
	Aug 75	414	"	"
	Aug 76	511	"	"
Cape Krenitzin to Moffet Pt.	24 Apr 81	150	aerial survey for emperor geese	R. King
Izembek Lagoon	general	600-700	estimated total population	Kenyon and King 1965
Izembek Lagoon, mouth	19 Apr 65	350	hauled out on sandbars; aerial survey for sea otters	"
Izembek Lagoon	27 Apr 81	150		Izembek NWR files
	May 57	620	aerial photo survey	Mathisen and Lopp 1963
	8 May 65	350	hauled out on sandbars; aerial survey for sea otters	Kenyon and King 1965
Izembek Lagoon (incl. Moffet Pt.)	Jun 75	2,034	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	559	"	"
	Jun 77	874	"	"
Izembek Lagoon	11 Jun 82	groups of 150-200		Izembek NWR files
Izembek Lagoon, Norma Bay	23 Jun 67	20		"
Izembek Lagoon	24 Jun 51	200	"I wouldn't put much emphasis on the annual distribution of sightings. Seals are common in the lagoon and especially	C. Dau, Izembek NWR

Table 3., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Izembek Lagoon, cont.			obvious at low tides when they can haul out on exposed sand. Bars near the main channels (outlets) appear to be most preferred."	C. Dau, Izembek NWR
	27 Jun 75	5,000	aerial survey; hauled out on sandbars; 1,842 counted on one bar	J. Sarvis
Izembek Lagoon, Norma Bay	9 Jul 67	85		Izembek NWR files
Izembek Lagoon, Applegate Cove	13 Jul 68	100	hauled out on sandbar	"
Izembek Lagoon, Moffet Pt.	13 Jul 82	+ 400	hauled out; visual estimate from aerial survey	K. Frost
Izembek Lagoon, Norma Bay	26 Jul 67	200		Izembek NWR files
Izembek Lagoon	mid-Jul 75	4,500	aerial survey	J. Sarvis
	Aug 57	1,142	aerial photo survey	Mathisen and Lopp 1963
	Aug 75	208	aerial survey; highest count for month	Everitt and Braham 1980
	Aug 76	1,204	"	"
	11 Oct 81	3	boat survey - W entrance	J. Burns
Izembek Lagoon, Moffet Pt.	18 Oct 67	800-1,000		Izembek NWR files
	21 Oct 66	250		"
Amak Is.	3-4 Mar 60	13	aerial survey	Kenyon 1960a
	Jun 75	14	highest count recorded for month; aerial survey for sea lions; large groups counted from photos; offshore rocks and volcanic beaches	Everitt and Braham 1980
	Jun 76	46	"	"
	Jun 77	12	"	"
	Aug 75	61	"	"
	Aug 76	14	"	"
	16 Oct 81	3	2 hauled out, 1 in water; all on SE side; boat survey	K. Frost
Cathedral River (Cape Leontovich)	4 Jul 65	20		Izembek NWR files

Table 3., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Cape Lieskof	Jun 75	125	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	199	"	"
	Jun 77	1	"	"
	Aug 75	89	"	"
	Aug 76	1	"	"
	29 Oct 65	100		Izembek NWR files
Cape Seniavin	Jun 75	10	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1960
	Jun 76	71	"	"
	Jun 77	2	"	"
	11 Jul 73	40	hauled out on bar at river mouth; aerial survey	K. Pitcher
	Aug 75	0	aerial survey for sea lions	Everitt and Braham 1980
	Aug 76	0	"	"
Port Moller (including Nelson Lagoon)	Jun 75	6,078	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	7,968	"	"
	Jun 77	4,335	"	"
Port Moller area	11 Jul 73	1,675 - 26 groups	hauled out, largest group ± 300; aerial survey	K. Pitcher
Port Moller/Deer Is. area	18 Jul 65	1,400		Izembek NWR files
Port Moller (including Nelson Lagoon)	Aug 75	1,740	highest count recorded for month; aerial survey for sea lions; largest group counted from photos	Everitt and Braham 1980
	Aug 76	1,701	"	"
Port Moller, Nelson Lagoon	9 Oct 65	1,500		Izembek NWR files
Port Moller (W side of entrance)	10 Oct 81	500-600	hauled out; boat survey	K. Frost/J. Burns

Table 3., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Port Moller	Dec 57	431	aerial photo survey	Mathisen and Lopp 1963
Bear River	18 Jul 65	6		Izembek NWR files
WALRUS				
Unimak Is., Cape Sarichef	27 Mar 80	1 male		Izembek NWR files
Unimak Is., Otter Pt.	11 May 67	present		"
Amak Is.	general	present		USFWS/BB Manage. Plan Maps
	9 Mar 81	none		Izembek NWR files
	7 Apr 81	none		F. Fay, RESOLUTION cruise
	8 Apr 62	± 100	hauled out, adult males; aerial photo survey	Kenyon 1962b
	15 Apr 69	100	E side, 1/2 mi N of prominent southern point	K. Schneider
	7 May 80	0		J. Sarvis
	8 May 65	5	in water; aerial survey	K. Kenyon
	early Jun 79		rumors of walrus	Izembek NWR files
	6 Jun 80	0		J. Sarvis
	23 Jun 80	0		"
	28 Jun 79	500 males	on SW side (the Head)	"
	2 Jul 80	0		"
	13 Jul 82	0		K. Frost
	15 Jul 79	400 males	hauled out and in water on SW side (the Head)	J. Sarvis
	28 Jul 79	50 males	on SW side (the Head)	"
	26 Aug 79	0	checked SW side only	"
	29 Aug 79	20 males	along reef at SE corner and on rocks along E side	"
	1 Sep 79	4-5	along E side	"
	6 Sep 79	9 males	on rocks, SW side	"
	11 Oct 81	0		K. Frost

Table 3., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Amak Is., cont.	16 Oct 81	0		K. Frost
	fall until 1 Nov 79	many	hauled out	R. Tremaine
Cape Glazenap	8 May 65	± 75	in water, aerial survey	K. Kenyon
Port Moller, W side	Jan-Feb 69	± 200		J. Hemming
Port Moller, Herendeen Bay	20 Apr 68	500-1,000	hauled out, all males	J. Burns
Port Moller, Pt. Divide	21 Apr 82	4		Izembek NWR files
Port Moller bars and beaches	late Apr-early May 79	2-4,000	hauled out; reports from air taxi operators and residents	C. Smith
Port Moller, Pt. Divide	27 Apr 82	0		Izembek NWR files
Port Moller	3 May 82	0		"
Port Moller - spit	6 May 80	750-1,000	hauled out; aerial survey	T. Schmitt
Port Moller	mid-May 79	400		C. Smith
	27 May 80	± 800		Izembek NWR files
	summer 76	"thousands"	offshore	R. Tremaine, from fishermen
Port Moller, N of, mouth of Bear River	17 Apr 79	100	reports from residents--2-4,000 hauling out on bars and beaches of Port Moller over next 4 weeks	L. Steele/ W. Fleek
Cape Seniavin	general	present	haulout	USFWS/BB Manage. Plan Maps
	late Mar 80	many	hauled out	C. Smith
	5 Apr 80	600	hauled out; counted from ground	J. Sarvis
	7 Apr 80	500-600	hauled out	S. Reynolds
	7 Apr 81	1,500-2,000	aerial survey for walrus	L. Lowry
	8 Apr 81	± 1,000	hauled out on beach; chased off beach later that day; by 1745 hrs none left on beach	F. Fay, RESOLUTION cruise
	9 Apr 81	60-100		"
	10 Apr 80	50	hauled out; aerial survey	S. Reynolds
	10 Apr 81	100		F. Fay, RESOLUTION cruise
	11 Apr 81	40	30 on beach, 10 in water	"

Table 3., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Cape Seniavin, cont.	12 Apr 81	34	25 on beach, 9 in water	*F. Fay, RESOLUTION cruise
	13 Apr 80	0		J. Sarvis
	14 Apr 80	0		L. Lowry
	16 Apr 80	1,000-1,500		F. Fay/C. Smith
	17 Apr 80	1,000	hauled out, very few at sea	C. Smith
	18 Apr 80	383		L. Lowry
	21 Apr 82	0		Izembek NWR files
	23 Apr 78	140 males		J. Sarvis
	23 Apr 81	0	no live walrus	R. Sellers
	27 Apr 82	0		Izembek NWR files
	Apr-May 79	several hundred	hauled out	J. Sarvis
	Apr-May 80	± 1,000	hauled out; by late May moved 30 mi SW to Port Moller area due to harassment and shooting; regular spring occurrence	Izembek NWR 1980 Rep.
	15 May 80	200	all in north cove	C. Smith
	20 May 80	1		L. Hood
	21 May 80	2		"
	22 May 80	100		"
	23 May 80	130	harassed by aircraft, abandoned beach in p.m.	"
	25 May 80		walrus left	Izembek NWR files
	14 Jun 80	0		"
KILLER WHALE				
Cape Sarichef	unknown	present		Braham et al. 1977a
Cape Mordvinof	unknown	present		"
BELUKHA WHALE				
Unimak to Port Heiden		0	never observed; natives never mention	M. Bricker

Table 3., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
Port Moller	Jul 79	1	from local fishermen	J. Burns
Port Moller, NW of	13 Apr 76	> 300	C. Ray observed	Braham and Krogman 1977
HARBOR PORPOISE				
Port Moller, entrance	14 Jun 80	2		J. Burns, RESOLUTION cruise
Port Moller	14 Jun 80	3		"
Cape Seniavin	9 Apr 81	4		F. Fay, RESOLUTION cruise
	14 Jun 80	4		J. Burns, RESOLUTION cruise
Cape Seniavin to Port Moller	18 Apr 81	9		F. Fay, RESOLUTION cruise
MINKE WHALE				
Unimak Is., Urilia Bay	23 Apr 76	1	aerial survey	R. Gill
Cape Seniavin	9 Apr 81	1		F. Fay, RESOLUTION cruise
	14 Jun 80	1		J. Burns, RESOLUTION cruise
GRAY WHALE				
Unimak Pass	Apr-Jun 77	+ 2,100 counted; ± 10,000 estimated	northward migration	Hall 1979
	late Oct-early Jan	present	southward migration	Rugh 1981
	20 Nov - 9 Dec 77	2,055 counted; 11,179 ± 878 estimated	82.5 hrs of systematic, shore-based observations	Rugh and Braham 1979
Unimak Is., Sea Lion Pt. (S of Cape Sarichef)	13 May 77	present	in water below cliffs.	USFWS/SBCS Rep.
Unimak Is., Cape Sarichef	23 Apr 76	present	aerial survey	R. Gill

Table 3., continued

Location	Date	Number	Comments	Source
GRAY WHALE, cont.				
Port Moller, Nelson Lagoon	18 Apr - 15 Oct 77	present	up to 30 whales at any one time	R. Gill
	23 Apr 76	present	aerial survey	"
Moffet Pt. to Nelson Lagoon	27 Apr 81	10	aerial survey	"
Port Moller, Nelson Lagoon	27 Apr 81	2		"
	18 May - 2 Sep 76	present	up to 30 whales at any one time	"
	20 Jun - 5 Oct 79	present	fewer than 30 whales at any one time	"
	13 Sep - 10 Oct 76	present	up to 30 whales at any one time	"
	25 Sep - 16 Oct 78	present	fewer than 30 whales at any one time	"
	2 Oct 79	1	feeding in upper lagoon; aerial survey for birds	R. King
	15-23 Nov 76	present	up to 30 whales at any one time	R. Gill
Port Moller	12 Jun 80	abundant		J. Burns
	10 Oct 81	6	milling--stayed in area at least 1 hr; boat survey	K. Frost/J. Burns
Cape Seniavin	8 Apr 81	"numerous"	off coast	F. Fay, RESOLUTION cruise
	10 Apr 80	6	moving N, 1/4 mi offshore	S. Reynolds
	11 Apr 81	3		F. Fay, RESOLUTION cruise
	13 Apr 81	5		"
Cape Seniavin area	14 Jun 80	6		J. Burns, RESOLUTION cruise
Port Moller, Nelson Lagoon to Ilnik	11 Jun 80	12		"
SEA OTTER				
Unimak Is., Sennet Pt.	Mar 58	75		Lensink 1960
Unimak Is., Cape Mordvinof	Mar 58	20		"
Unimak Is. area	8 Apr 62	486	aerial photo survey; most near 20-fathom curve and 4-8 mi offshore	Kenyon 1962b

Table 3., continued

Location	Date	Number	Comments	Source
SEA OTTER, cont.				
Unimak Is. to Amak Is.	8 Apr 62	1,081	estimated total; 811 counted	Kenyon 1969
Unimak Is., Rocky Pt. to Isanotski Strait	24 Apr 81	77	aerial survey for emperor geese	R. King
Unimak Is., Cape Sarichef to Cape Mordvinof	8 May 65	10		Kenyon 1969
Unimak Is., Cape Mordvinof to Isanotski Strait	8 May 65	143		"
Unimak Is. to Amak Is.	8 May 65	3,856	estimated total; 2,892 counted	"
Unimak Is., N side	summer 49	3-5		Lensink 1960
	Jul 57	786		"
Unimak Is., Cape Lapin to Swanson Lagoon	Jul 76	700-800	2-3 mi offshore	Izembek NWR files
Unimak Is., Urilia Bay	4 Jul 73	15 +		USFWS/SBCS Rep.
Unimak Is., Cape Mordvinof to Cape Lieskof	Aug 75	2,605	counted on aerial coast transects	Schneider 1976
		17,173	total estimate of population	
			critical habitat for population; few otters seen N of Cape Lieskof	
Unimak Is., W end	Sep 57	3		Lensink 1960
Isanotski Pt. to Moffet Pt.	8 May 65	2,678	aerial survey	Kenyon 1969
Cape Krenitzin to Moffet Pt.	24 Apr 81	3	aerial survey for emperor geese	R. King
Bechevin Bay - Isanotski Strait to Kenmore Head	27 Apr 81	350		Izembek NWR files
Bechevin Bay - remainder of bay	27 Apr 81	77		"
Cape Glazenap, offshore of base	14 Jun 82	1,250	loose pod in 1-mi area; largest group - 600, others in pods of 50-150	"
Cape Glazenap	2 Jul 80	700		"
Bechevin Bay	30 Jul 75	186	aerial survey	Schneider 1976
	8 Oct 75	75		Izembek NWR files
Izembek Lagoon	Jan-Dec 65	"large numbers"	before 1965 were few/none; now reestablished in lagoon	Aleutian Is. NWR Rep., Jan-Dec 1976
	21 Apr 82	13		Izembek NWR files

Table 3., continued

Location	Date	Number	Comments	Source
SEA OTTER, cont.				
Izembek Lagoon, cont.	27 Apr 81	3		Izembek NWR files
Izembek Lagoon, Neumann Is.	Jun or Jul 78	± 1,500-2,000	in large group	"
Izembek Lagoon, Moffet Pt.	14 Jun 82	800	in 2-mi area offshore; largest group - 75	"
Izembek Lagoon, Operl Is.	13 Jul 78	several hundred	four large groups	"
Izembek Lagoon, Neumann Is.	2 Oct 70	130		"
Izembek Lagoon, Moffet Lagoon	11 Oct 81	20	most in water; 1 on island, 1 female with pup; boat survey	J. Burns
Izembek Lagoon	13 Oct 60	1		Izembek NWR 1960 Annu. Rep.
	17-19 Dec 63	several		Kenyon 1969
	winter 73-74	0	Bering Sea froze 3rd time in 4 years; wiped out last of otters	Aleutian Is. NWR Rep., FY 74
Moffet Pt. to Port Moller	8 May 65	59	aerial survey	Kenyon 1969
Moffet Pt. to Cape Leontovich	13 Jul 82	+ 500	aerial survey; pods of 10-100	K. Frost
Amak Is.	9 Mar 81	60		Izembek NWR files
	8 Apr 62	5	aerial photo survey	Kenyon 1962b
Amak Is., SW of	8 Apr 62	325	"	"
Amak Is.	8 May 65	11	aerial survey	Kenyon 1969
	Sep 57	40		Lensink 1960
Amak Is. (S, W, & NW sides only)	11 Oct 81	4	including 1 very large male; boat survey	K. Frost/J. Burns
Amak Is. (S side only)	16 Oct 81	36	boat survey	K. Frost
Port Moller	10 Oct 81	"several"	boat survey	K. Frost/J. Burns
Port Moller to Ilnik	21 Apr 82	4		Izembek NWR files

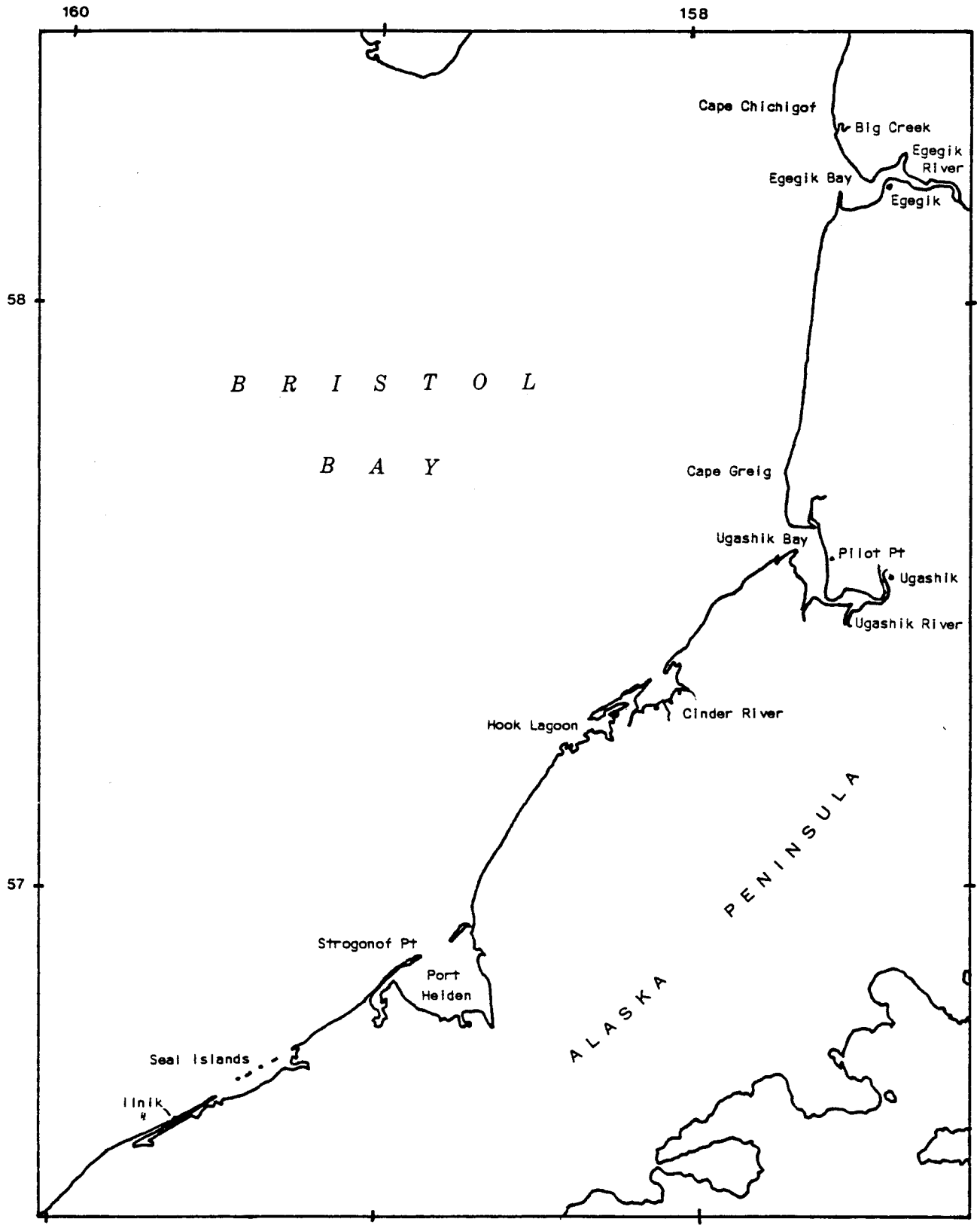

Figure 4. Map of the North Aleutian Basin, region NAB 2.

Table 4. Sightings of coastal marine mammals in the North Aleutian Basin, region NAB 2.

Location	Date	Number	Comments	Source
HARBOR SEAL				
Iliik	5 Jun 71	3,200	aerial survey	K. Pitcher
	18 Jun 71	1,000	"	"
	6 Jul 71	860	"	"
	14 Jul 71	1,550	"	"
	2 Aug 71	1,350	"	"
Seal Islands	5 May 67	200	"	"
	Jun 75	1,137	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	786	"	"
	Jun 77	497	"	"
	1 Jun 67	300	aerial survey	K. Pitcher
	5 Jun 71	400	"	"
	7 Jun 66	1,000	"	"
	13 Jun 66	1,000	"	"
	20 Jun 70	1,000	"	"
	21 Jun 70	1,000	"	"
	24 Jun 66	500	"	"
	30 Jun 66	1,100	"	"
	30 Jun 69	900	"	"
	2 Jul 68	300	"	"
	4 Jul 66	400	"	"
	6 Jul 66	700	"	"
	10 Jul 68	3,500	"	"
	11 Jul 73	375	"	"
	17 Jul 68	300	"	"
	17 Jul 69	1,000	"	"
	18 Jul 67	500	"	"
	22 Jul 66	150	"	"
	23 Jul 68	400	"	"

Table 4., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Seal Islands, cont.	25 Jul 70	1,600	aerial survey	K. Pitcher
	31 Jul 68	400	"	"
	Aug 75	75	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Aug 76	241	"	"
	2 Aug 66	250	aerial survey	K. Pitcher
	4 Aug 68	450	"	"
Port Heiden, Strogonof Pt.	Jul-Aug 56	100	aerial survey; visual estimate	Mathisen and Lopp 1963
	Dec 57	1,295	aerial photo survey	"
Port Heiden	18 Apr 77	500	no pups; in drifting ice; boat survey	J. Burns
	5 May 67	800	aerial survey	K. Pitcher
	19 May 65	2,500-3,000	" "	
	24 May 76	650	aerial survey for herring	M. Dick
	31 May 66	850	aerial survey	K. Pitcher
	Jun 75	5,273	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	10,548	"	"
	Jun 77	6,222	"	"
	1 Jun 67	350	aerial survey	K. Pitcher
	5 Jun 71	1,000	"	"
	7 Jun 66	800	"	"
	18 Jun 71	5,900	"	"
	20 Jun 70	4,000	"	"
	21 Jun 70	3,100	"	"
	24 Jun 66	1,500	"	"
	27 Jun 69	1,400	"	"
	27 Jun 70	2,400	"	"

Table 4., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Port Heiden, cont.	29 Jun 69	2,100	aerial survey	K. Pitcher
	30 Jun 66	2,500	"	"
	30 Jun 69	1,900	"	"
	1 Jul 65	8,000-10,000	"	"
	2 Jul 68	1,200	"	"
	2 Jul 70	6,500	"	"
	4 Jul 66	1,600	"	"
	4 Jul 69	2,100	"	"
	6 Jul 66	2,300	"	"
	6 Jul 71	2,000	"	"
	8 Jul 69	1,300	"	"
	10 Jul 68	2,500	"	"
	11 Jul 73	4,298	aerial survey, counted from photos	"
	14 Jul 69	1,500	aerial survey	"
	14 Jul 71	1,600	"	"
	17 Jul 66	1,200	"	"
	17 Jul 68	3,000	"	"
	17 Jul 69	2,050	"	"
	18 Jul 67	2,300	"	"
	18 Jul 70	2,100	"	"
	22 Jul 66	650	"	"
	23 Jul 68	3,000	"	"
	23 Jul 69	1,000	"	"
	25 Jul 69	1,300	"	"
	25 Jul 70	2,600	"	"
	29 Jul 69	1,400	"	"
	31 Jul 68	1,000	"	"
	Aug 75	3,453	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980

Table 4., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Port Heiden, cont.	Aug 76	4,782	aerial survey	K. Pitcher
	1 Aug 65	2,500-3,000	"	"
	2 Aug 66	750	"	"
	2 Aug 71	1,700	"	"
	4 Aug 68	800	"	"
	9 Oct 81	1,100	hauled out at low tide; mixed sex and age classes; many swimming by; boat survey	J. Burns/K. Frost
Port Heiden, N of	Jun 75	0	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	48	"	"
	Jun 77	4	"	"
	Aug 75	0	"	"
	Aug 76	0	"	"
Cinder River	19 May 65	1,000	aerial survey	K. Pitcher
	Jun 75	2,867	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	4,503	"	"
	Jun 77	1,530	"	"
	5 Jun 71	1,500	aerial survey	K. Pitcher
	13 Jun 66	1,500	"	"
	24 Jun 66	1,000	"	"
	27 Jun 69	500	"	"
	2 Jul 68	600	"	"
	2 Jul 70	3,400	"	"
	6 Jul 66	950	"	"
	10 Jul 68	800	"	"
	11 Jul 73	875	"	"
	14 Jul 71	350	"	"

Table 4., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Cinder River, cont.	17 Jul 68	700	aerial survey	K. Pitcher
	18 Jul 67	3,000	"	"
	23 Jul 68	800	"	"
	31 Jul 68	200	"	"
	Aug 75	113	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Aug 76	1,008	"	"
	2 Aug 66	2,000	aerial survey	K. Pitcher
	4 Aug 68	250	"	"
	5 Aug 66	2,000	"	"
	8 Oct 81	350	many juveniles in water; boat survey	K. Frost/J. Burns
Ugashik Bay	Jun 75	196	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	163	"	"
	Jun 77	215	"	"
	Aug 75	2	"	"
	Aug 76	438	"	"
Ugashik River, mouth	11 Jul 73	40	hauled out on bar; aerial survey	K. Pitcher
Cape Greig	Jun 75	0	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
	Jun 76	1	"	"
	Jun 77	2	"	"
	Aug 75	0	"	"
	Aug 76	0	"	"
Egegik Bay	Jun 75	50	"	"
	Jun 76	70	"	"
	Aug 75	0	"	"

Table 4., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Egegik Bay, cont.	Aug 76	0	highest count recorded for month; aerial survey for sea lions; large groups counted from photos	Everitt and Braham 1980
Egegik, flats below Big Cr.	11 Jul 73	300	hauled out; aerial survey	K. Pitcher
WALRUS				
Port Heiden, Strogonof Pt.	30 Jun 79	40 males	hauled out	J. Sarvis
Port Heiden	Jun-Jul 79	present		Fay and Lowry 1981
	16 Jul 79	40-50	on sandbar at mouth of port	J. Sarvis
	2 Oct 79	1 male	on land	"
Cinder River, mouth	late May 73	1 male	hauled out	J. Faro
Cinder River, 10 mi W, Hook Lagoon	early Oct 71	1 male	"	"
Cinder River to Ugashik Bay	May 62, 63	present		Fay and Lowry 1981
Ugashik Bay, SW of Pilot Pt.	May 62	"a few"		O. Seybert
BELUKHA WHALE				
Seal Islands	11 Jun 80	"numerous"	traveling parallel to shore, close in	J. Burns, RESOLUTION cruise
near Ugashik Bay	15 Oct 76	1		Harrison and Hall 1978
Ugashik Bay	early Nov 70	present	high concentration	O. Seybert/W. Fleek
Egegik Bay, approx. 20 mi W	22 Jan 81	1		L. Lowry
Egegik Bay, S of	21 Mar 77	3	3 km from shore	Harrison and Hall 1978
MINKE WHALE				
Seal Islands	18 Apr 81	2		F. Fay, RESOLUTION cruise
GRAY WHALE				
Ilnik	15 Jun 80	1	near shore	J. Burns, RESOLUTION cruise

Table 4., continued

Location	Date	Number	Comments	Source
GRAY WHALE, cont.				
Ilnik to Port Heiden	11 Jun 80	31		J. Burns, RESOLUTION cruise
Port Heiden, SW of	18 Apr 77	20+	about 1 mi off beach	L. Lowry
Seal Islands to Port Heiden	24 Apr 81	19	feeding	R. Gill
	27 Apr 81	12		"
Port Heiden	15 Apr 80	6	swimming N; aerial sighting	A. Tibbitts
	18 Apr 81	7		F. Fay, RESOLUTION cruise
Port Heiden, NE of	18 Apr 81	3		"
Port Heiden to Cinder River	24 Apr 81	13	all <800 m from shore	R. Gill
	27 Apr 81	31		"
Port Heiden to Ugashik	11 Jun 80	34	along shore	J. Burns, RESOLUTION cruise
Cinder River to Ugashik Bay	24 Apr 81	9	all within 1 km from shore	R. Gill
	27 Apr 81	42	19 at mouth of Ugashik Bay; most feeding as they moved NE; aerial survey	"
Ugashik, N of	11 Apr 80	4-6	swimming N; aerial survey	C. Smith
Ugashik Bay to Egegik	24 Apr 81	23	aerial survey	R. Gill
	27 Apr 82	18	"	"
Ugashik Bay	Jun 82	several thousand	swimming by; several hundred came into bay to feed; vessel observations	J. Hall
Egegik, 1/2 mi offshore	2 May 80	± 30	swimming N; aerial sighting	A. Tibbetts
Egegik Bay	15 Jun 80	2		J. Burns, RESOLUTION cruise
SEA OTTER				
Seal Islands	21 Apr 82	33		Izembek NWR files
Port Heiden	21 Apr 82	9		"
	9 Oct 81	present	boat survey	K. Frost/J. Burns

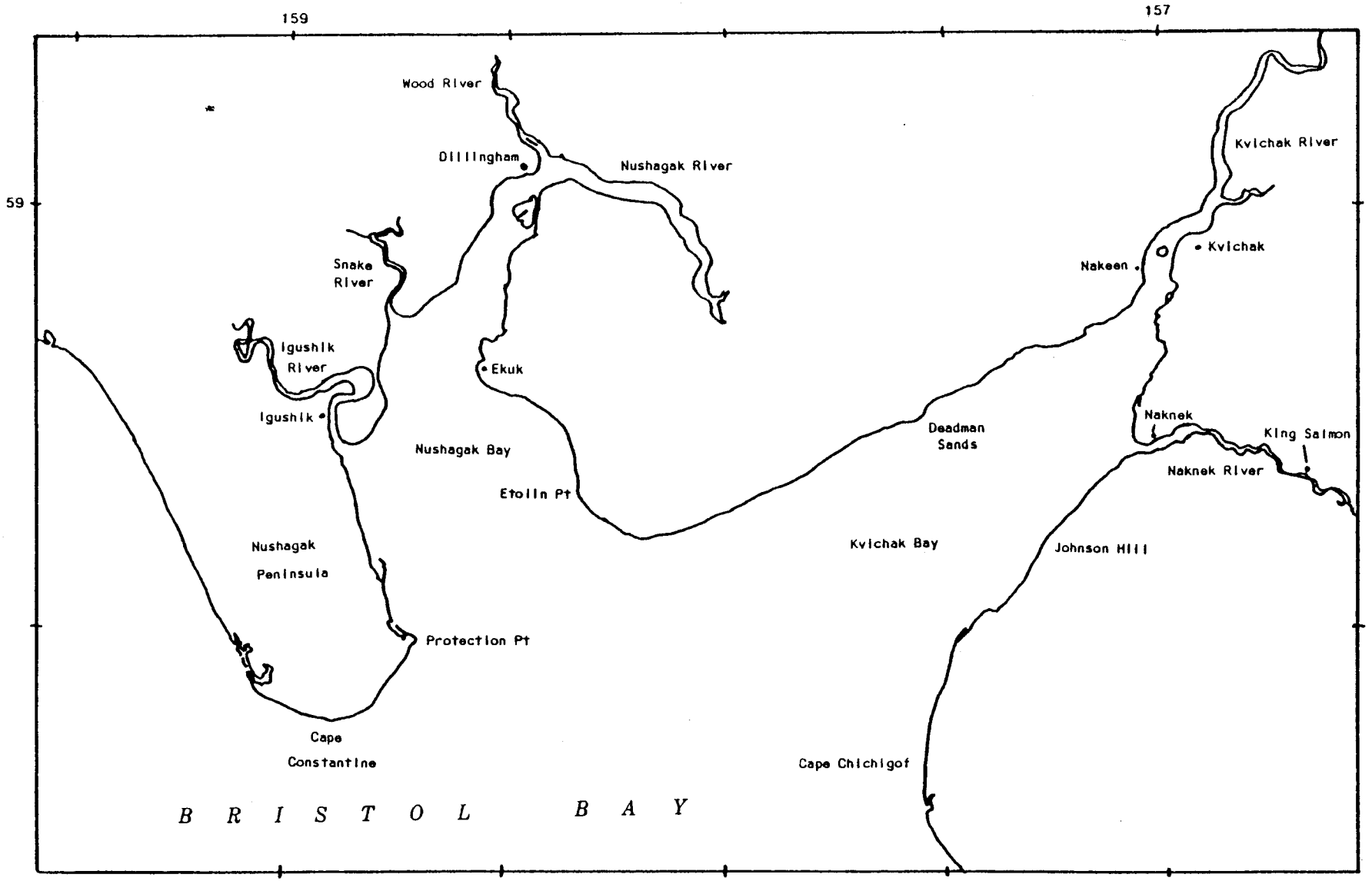

Figure 5. Map of the North Aleutian Basin, region NAB 3.

Table 5. Sightings of coastal marine mammals in the North Aleutian Basin, region NAB 3.

Location	Date	Number	Comments	Source
HARBOR SEAL				
Deadman Sands	11 Jul 73	150	hauled out on sandbar; aerial survey	K. Pitcher
Etolin Point, E of	8 May 81	1	swimming; aerial survey	L. Lowry
Kvichak Bay, N shore	8 May 81	1	"	"
Protection Pt., S of	8 May 81	14	"	"
Protection Pt.	20 May 77	12+	in water; aerial survey for herring	L. Barton
Nushagak Peninsula, E side	30 May - 15 Jun 75	present	"medium" haulout; aerial survey for herring	R. Baxter
	7-14 Jun 75	present	boat survey for herring	"
	Aug 74	present	"medium" haulout; aerial survey for herring	"
Cape Constantine	26 Jun 81	5	in water; aerial survey	D. Calkins
	29 Jul 81	75-100	hauled out; aerial survey	"
Nushagak Peninsula, W side	8 May 81	2	in water 30-60 m offshore; aerial survey	L. Lowry
	8 May 81	1	in water near shore; aerial survey	"
Nushagak Peninsula to Cape Newenham	1979-1982	present	scattered along coast; no major concentrations or haulouts in area except Nanvak Bay	L. Hotchkiss
WALRUS				
Cape Constantine	Jul 63	1	bull; hauled out	Burns 1965
KILLER WHALE				
Etolin Pt.	24-30 Jun 81	1	feeding; many salmon in area	fishermen
BELUKHA WHALE				
Johnson Hill	3 Jun 76	3	aerial survey	ADF&G herring survey
Naknek River	spring	many	ascend rivers on rising tides	N. Steen
Naknek, 5 mi W	7 Apr 81	2	aerial survey for walrus	L. Lowry

Table 5., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
Naknek, approx. 10 mi W	7 Apr 81	13	aerial survey for walrus	L. Lowry
Naknek River, mouth	7 Apr 81	15 +	"	"
Naknek	8 Apr 80	± 20	seen from shore	J. Winjum
Naknek River, mouth	10 Apr 80	present	aerial sighting	J. Drew
Naknek River, 15 mi up, past King Salmon	prior to mid-May	100-200+	feed on smelt, ascend on rising tides	D. Bill/N. Steen
Naknek River	28 May 76	3	aerial survey	ADF&G herring survey
Kvichak River	spring	many	ascend on rising tides	N. Steen
Kvichak River, mouth	May & Jun	50-500 daily	move up and down river 20-30 km daily, feeding	Fish and Vania 1971
Kvichak River	20 May-11 Jun 66	present	feeding on red salmon fingerlings and smelt	ADF&G Annu. Rep. 1969
	26 May-17 Jun 54	present	feeding on smelt and salmon fry	"
	5 Aug-18 Aug 54	present	feeding on salmon	"
Kvichak River, Nakeen	26 Jun 81	> 30	aerial survey	D. Calkins
	26 Jun 81	1	"	"
Kvichak Bay, W side	28 Jun 79	250+	several hundred more probably present	R. Randall
Kvichak area	Apr-early May 79	hundreds		N. Steen
Kvichak Bay	late Apr-May 79	many	ascend rivers	R. Randall
	May 54	250		Brooks 1955
	May 79	200-300+		N. Steen
Kvichak Bay	late May-Jul 79	many		R. Randall
	May 55	100		Brooks 1955
	Jun 54	250-400		"
	Jun 55	150-250		"
	Jun-Jul 79	many	often common around mouth	N. Steen
	Aug 54	600		Brooks 1955
	Aug 55	50-100		"

Table 5., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
Kvichak Bay, central	18 Sep 80	2		L. Lowry
Kvichak Bay, outer	25 Apr 77	2	1 km offshore	Harrison and Hall 1978
	25 Apr 77	3	4 km offshore	"
	25 Apr 77	4	8 km offshore	"
Nushagak Bay, E of Etolin Pt.	26 Jun 81	35	aerial survey	D. Calkins
Nushagak Bay, Ekuk to Etolin Pt.	1 Oct 79	25-50	100 yards offshore, feeding	N. Steen
Nushagak River	Spring	many	ascend on rising tides as far as Portage Creek	"
	Apr, early May 79	100's		"
	23 Jun-28 Jul	present	feeding on salmon	ADF&G Annu. Rep. 1969
Nushagak Bay, Dillingham	26 Jun 81	7	aerial survey	D. Calkins
	29 Jul 81	4	"	"
Wood River mouth	11 Jun 79	6	feeding; aerial survey	Fried et al. 1979
	14 Jun 79	11	appeared to be feeding; aerial survey	"
	25 Jun 79	11	aerial survey	"
Snake River mouth	28 Jun 79	80-120	apparently feeding; immatures present; aerial survey	"
	10 Jul 82	+ 600	calving occurring; aerial survey estimate	K. Frost
	29 Jul 81	5	aerial survey	D. Calkins
Nushagak Peninsula, E of	29 Jul 81	2	"	"
	29 Jul 81	1	"	"
Igushik River, NE of	26 Jun 81	2	offshore; aerial survey	"
Nushagak Bay	27 May 76	4	aerial survey	ADF&G herring survey
	late May-Jul 79	many		R. Randall
	Jun 54	250-400		Brooks 1955
	Jun 55	250		"

Table 5., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
Nushagak Bay, cont.	Jun-Jul 79	many	often common at river mouth	N. Steen
	Jul 54	400		Brooks 1955
	Jul 55	250-450		"
	Aug 54	400		"
	Aug 55	450		"
	late Aug 79	3		N. Steen
	30 Aug 79	present	swimming E to W	R. Naveen
Nushagak Bay estuaries	26 May 79	1	aerial survey	Fried et al. 1979
	4 Jun 79	20	"	"
	11 Jun 79	16	"	"
	20 Jun 79	31	"	"
	22 Jun 79	3	"	"
	25 Jun 79	20	"	"
	27 Jun 79	37	"	"
Nushagak Bay, outer	26 Apr 77	1	8 km offshore	Harrison and Hall 1978
HARBOR PORPOISE				
N Bristol Bay, inshore	Jun & Aug (72?)	common - small numbers		R. Baxter
GRAY WHALE				
Egegik to Johnson Hill	24 Apr 81	69		R. Gill
Cape Chichigof	27 Apr 81	1	moving N	"
Cape Constantine, W side	8 May 81	4-5	apparently feeding, 100-300 m offshore; aerial survey for walrus	L. Lowry
Cape Constantine, W of	20 May 77	1	moving NW along coast; aerial survey for herring	L. Barton
	24 May 81	several	along W side of Nushagak Peninsula	Ljungblad et al. 1982

Table 5., continued

Location	Date	Number	Comments	Source
GRAY WHALE, cont.				
Cape Constantine	27 May 76	3	aerial survey	ADF&G herring survey
Nushagak Peninsula, W side	26 Jun 81	1	"	D. Calkins

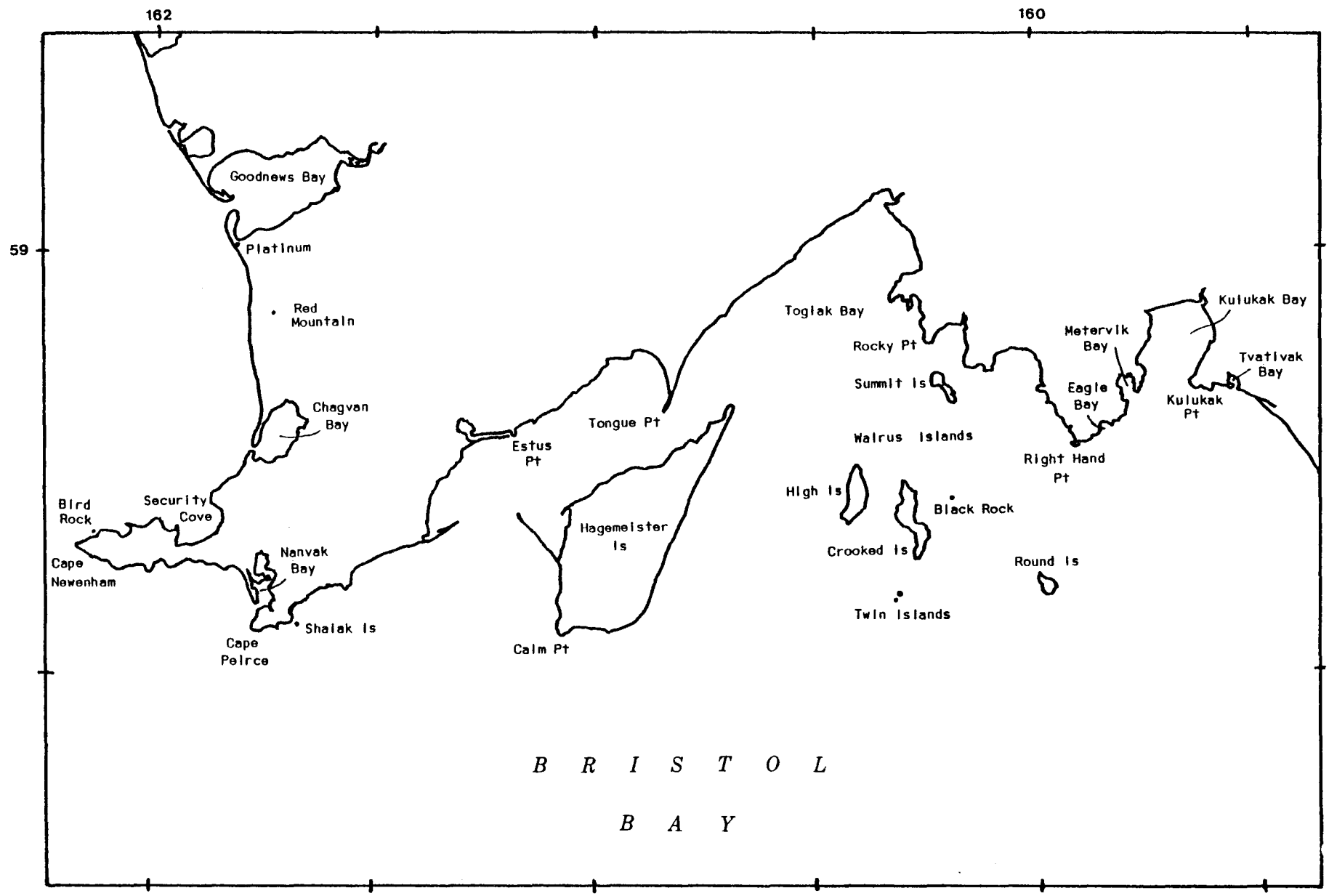

Figure 6. Map of the North Aleutian Basin, region NAB 4.

Table 6. Sightings of coastal marine mammals in the North Aleutian Basin, region NAB 4.

Location	Date	Number	Comments	Source
STELLER SEA LION				
Tongue Pt. to Kulukak Pt.	30 May 75	"lots" present	all along coast; aerial survey for herring	R. Baxter
Kulukak Bay	19 May 67	present	feeding (?) on herring; aerial survey for herring	L. Barton
Right Hand Pt., E of	8 May 81	40-50	feeding; herring spawn visible; aerial survey	L. Lowry
	26 May 72	2	in water; aerial survey for herring	L. Barton
Right Hand Pt.	28 May 68	"hundreds"	in water; lots of herring schools close by; aerial survey for herring	"
Togiak Bay, SE of	8 May 81	2	in water; aerial survey	L. Lowry
	8 May 81	5	in water, feeding; visible schools of fish, probably herring; aerial survey	"
Estus Pt., W of	8 May 81	2	feeding; aerial survey	"
Hagemeister Is., Calm Pt.	general	present	haulout	USFWS/BB Manage. Plan Maps
	summer	150	ADF&G Ref. #295	FEIS 1978
Walrus Islands	Feb-Mar 60	none	aerial survey	Kenyon and Rice 1961
High Is. (S end)	summer	50	ADF&G Ref. #296	FEIS 1978
Crooked Is. (S end)	summer	50	ADF&G Ref. #297	"
The Twins	27 Apr 60	400		Kenyon and Rice 1961
	late Jun 58	66	mostly subadults and a few adult males	"
	summer	100	ADF&G Ref. #298	FEIS 1978
	summer 75	30-50	aerial survey	Braham et al. 1977a
S. Twin Is.	general	present	haulout	USFWS/BB Manage. Plan Maps
	30 May - 15 Jun 75	present	minor haulout; aerial survey for herring	R. Baxter
	7-14 Jun 75	1	hauled out; boat survey for herring	"
	20 Jun 58	45	hauled out on flat areas; 4 adult males, rest females or immature males; no pups	Kenyon 1958

Table 6., continued

Location	Date	Number	Comments	Source
STELLER SEA LION, cont.				
S. Twin Is., cont.	26 Jun 77	9	some hauled out, some in water	USFWS/SBCS Rep., P. Arneson/ D. McDonald
	12 Jul 73	200-300	aerial survey	K. Pitcher
	26 Jul - 4 Aug 56	300	adults only; aerial photo survey	Mathisen and Lopp 1963
	10 Sep 57	147	"	"
N. Twin Is.	12 Jul 73	100-150	adults only; aerial survey	K. Pitcher
Round Is., SE side	14 Apr 81	± 200	hauled out on rocks	F. Fay, RESOLUTION cruise
Round Is.	30 May - 15 Jun 75	moderate	hauled out; aerial survey for herring	R. Baxter
	Jun 75	325	aerial survey; count from photos	Braham et al. 1977a
	Jun 76	296	"	"
	summer 80	400-500	hauled out regularly	K. Taylor
	summer 81	200-250	hauled out regularly; sharp drop from summer 1980	"
Round Is., S end	summer	100	ADF&G Ref. #305	FEIS 1978
	7-14 Jun 75	1	hauled out; boat survey for herring	R. Baxter
Round Is., S end only	29 Jun 77	19	hauled out	USFWS/SBCS Rep., P. Arneson/ D. McDonald
Round Is., SE corner	12 Jul 73	400-500	adults only; aerial survey	K. Pitcher
Round Is.	Aug 74	moderate	hauled out; aerial survey for herring	R. Baxter
	Aug 75	244	aerial survey; count from photos	Braham et al. 1977a
Round Is., SW corner	7 Oct 81	200-300	70% subadult males, no pups or large bulls	K. Frost/J. Burns
Round Is., SW tip	11 Nov 70	50		J. Faro
Black Rock	18 Jun 77	6	in water	USFWS/SBCS Rep., P. Arneson/ D. McDonald
Cape Peirce, NE of	26 Jun 81	450	25 in water, rest hauled out; aerial survey	D. Calkins

Table 6., continued

Location	Date	Number	Comments	Source
STELLER SEA LION, cont.				
Cape Peirce, E of	26 Jun 81	1	in water; aerial survey	D. Calkins
Cape Peirce	general	present	haulout	USFWS/BB Manage. Plan Maps
Cape Newenham	general	present	"	"
	general	always present		Cape Newenham NWR Rep., Jan 66
	8 May 81	150	hauled out on rocks; aerial survey	L. Lowry
Cape Newenham, N side	8 May 81	1	in water; aerial survey	"
Cape Newenham, E of	8 May 81	1	hauled out on rocks; aerial survey	"
	8 May 81	1	in water; aerial survey	"
Cape Newenham	8 May 79	600	aerial survey for herring	L. Barton
	17 May 78	800	hauled out; aerial survey for herring	D. Jonrowe
	20 May 77	80	aerial survey for herring	L. Barton
Cape Newenham, S of	20 May 78	± 500	hauled out; aerial survey for herring	D. Jonrowe
Cape Newenham	27 May 77	100+	aerial survey for herring	L. Barton
Cape Newenham, N of	30 May 75	75	hauled out; aerial survey for herring	R. Baxter
Cape Newenham	summer every year	± 130	"Sea lions utilize this area throughout the summer months, then depart prior to Bering Sea ice-pack formation."	Togiak NWR 1981 Annu. Rep.
	30 May - 15 Jun 75	present	major haulout; aerial survey for herring	R. Baxter
Cape Newenham, S of	7-14 Jun 75	1	in water; aerial survey for herring	"
Cape Newenham	7-14 Jun 75	present	aerial survey for herring	"
	26 Jul - 4 Aug 56	250	adults only; aerial survey	Mathisen and Lopp 1963
	Aug 74	present	major haulout; aerial survey for herring	R. Baxter
	4 Aug 82	135	hauled out	L. Hotchkiss
	summer 80-82	100 - 1,500	hauled out each year on tip of cape	"

Table 6., continued

Location	Date	Number	Comments	Source
STELLER SEA LION. cont.				
Cape Newenham, cont.	10 Sep 57	30	adults only; aerial survey	Mathisen and Lopp 1963
	24-28 Sep 71	200-300	hauled out on rocks	Cape Newenham NWR 1971 Annu. Rep.
Security Cove	8 May 81	2	in water near gillnets and fish schools; aerial survey	L. Lowry
	8 May 81	1	"	"
	17 May 82	2	feeding	B. Dinneford
	18 May 82	1		"
	19 May 82	5	feeding, swimming	"
Security Cove, SW corner	23 May 82	1	feeding	"
Security Cove	29-31 May 82	± 40	swimming, feeding; groups of ± 10 along shore	"
Chagvan Bay, S end	8 May 81	1	in water; aerial survey	L. Lowry
HARBOR SEAL				
Tvativak Bay, W of	8 May 81	77	hauled out on rocks; 2 groups 60 + 15 on nearshore rocks; also 2 in water; aerial survey	L. Lowry
Kulukak Bay	16 May 79	present	aerial survey for herring	M. Nelson
SE Kulukak Pt.	21 May 79	present	in water; aerial survey for herring	"
Kulukak Pt., E of	29 May 75	present	"working" herring ball; flooding tide; aerial survey for herring	L. Barton
Kulukak Bay	2 May 79	present	in water, some near herring spawning areas; mostly in outer portion of the bay; aerial survey for herring	"
	21 May 73	"some present"	probably feeding on herring; aerial survey for herring	"
Metervik Bay	3 May 79	± 20	in water near herring spawn; aerial survey for herring	"
	16 May 77	"many"	in water; fresh herring spawn in area; aerial survey for herring	"

Table 6., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Eagle Bay (E Right Hand Pt.)	3 May 79	"much activity"	in water; aerial survey for herring	L. Barton
Right Hand Pt., E of	8 May 81	1	feeding, herring spawn visible; aerial survey	L. Lowry
Right Hand Pt., W of	26 Jun 81	1	in water; aerial survey	D. Calkins
Togiak Bay, E side	16 May 77	present	aerial survey for herring	L. Barton
	24 May 71	3	"	M. Nelson
	15 Jun 75	present	"	R. Baxter
Summit Is., N end, NW side	11 Jul 77	5	hauled out	USFWS/SBCS Rep., P. Arneson/ D. McDonald
Summit Is.	23 Sep 80	30	hauled out; aerial survey	USFWS Walrus Survey maps
Hagemeister Is., S tip	30 May 75	± 150	aerial survey for herring	R. Baxter
Hagemeister Is., SW end	30 May - 15 Jun 75	present	minor haulout; aerial survey for herring	"
	7-14 Jun 75	present	boat survey for herring	"
Hagemeister Is., W side	15 Jun 75	present	aerial survey for herring	"
Hagemeister Is., S tip	15 Jun 75	present	"	"
Hagemeister Is., S & SW ends only	9-10 Jul 77	± 70	hauled out, some with pups	USFWS/SBCS Rep., P. Arneson/ D. McDonald
Hagemeister Is.	Jul-Aug 75	20-200	aerial survey	Everitt and Braham 1980
Hagemeister Is., SW end	Aug 74	present	minor haulout; aerial survey for herring	R. Baxter
Hagemeister Is., pt. just N of Calm Pt.	23 Sep 80	100	hauled out; aerial survey	USFWS Walrus Survey maps
High Island, E side	5 & 10 Jul	12+ pups	hauled out	USFWS SBCS Rep., P. Arneson/ D. McDonald
High Island, W side	5 & 10 Jul	26+ pups	"	"
High Is., N end	12 Jul 73	20	aerial survey	K. Pitcher
High Is., S end	12 Jul 73	2	"	"
Crooked Is.	16 Jun - 14 Jul 77	"tens of harbor seals" with some pups	hauled out on rocks at several locations	USFWS/SBCS Rep., P. Arneson/ D. McDonald

Table 6., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Crooked Is., N end	12 Jul 73	1	aerial survey	K. Pitcher
Crooked Is., SW side	12 Jul 73	30	"	"
Round Is.	7 Oct 81	2	boat survey	J. Burns
Black Rock	12 Jul 73	20-30	aerial survey	K. Pitcher
	7 Oct 81	300	hauled out; most less than 4 yrs old; most light phase, only 3 dark phase; boat survey	K. Frost/J. Burns
Tongue Pt., W of	30 May 75	present	aerial survey for herring	R. Baxter
Cape Peirce, NE of	15 Jun 75	present	"	"
Cape Peirce, E of	6 Oct 81	present	present in most rocky coves E of Cape Peirce; no estimate of numbers; boat survey	K. Frost/J. Burns
Nanvak Bay, mouth	"always present"	1-2,000		Cape Newenham NWR Rep., Jan. 66
Nanvak Bay	late Apr & early May	200	haul out on sandbars inside bay	Togiak NWR 1981 Rep.
	5 May 80	200	hauled out	Clarence Rhodes NWR 1981 Rep.
	14 May 79	"couple hundred"	aerial survey for herring	L. Barton
	23 May 73	"many"	white-coated pups present	W. Arvey
	late May 81	50		Clarence Rhodes NWR 1981 Rep.
Nanvak Bay, W of	30 May 75	3	aerial survey for herring	R. Baxter
Nanvak Bay	Jun 75	50-450 (range for month)	hauled out, some pupping;	B. and P. Johnson
	7-14 Jun	present	boat survey for herring	R. Baxter
	mid-Jun 73	250-300	harbor seal breeding colony; pups present on sandbars	W. Arvey
	mid-Jun 73	few	spotted seals; white-coated pups present late May	"
	15 Jun 75	present	aerial survey for herring	R. Baxter
	Jul 75	300-750 (range for month)	90% harbor and 10% spotted seals	B. and P. Johnson
Nanvak Bay, mouth	25 Jul 70	1,000	700 counted in 2 main herds, estimated 1000 in area	M. Dick

Table 6., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Nanvak Bay	Aug 75	600-2,400 (range for month)	90% harbor seals and 10% spotted seals, molting	E. and P. Johnson
Nanvak Bay, entrance bars	4 Aug 82	± 150	hauled out; sandbar most heavily used for last 3 years mostly washed away this year, now used only at low tide; no new bars formed; aerial survey	L. Hotchkiss
Nanvak Bay	31 Aug 81	3,100	numbers decline in September; 10% spotted seal, 90% harbor seal; northernmost known pupping colony for harbor seals	Clarence Rhodes NWR 1981 Rep.
	3-8 Sep 75	2,400-3,000	molting; numbers probably decreased late in September	B. and P. Johnson
	13-25 Sep 79	2000	in 2 separate groups; hauled out on sandbars	Clarence Rhodes NWR 1979 Rep.
Nanvak Bay, mouth	24 Sep 71	458	hauled out on sandbars; spotted seals (harbor?) approx. 2/3 of of total, ringed (spotted?) approx. 1/3 of total	Cape Newenham NWR 1971 Annu. Rep.
	28 Sep 71	± 900	hauled out on sandbars following storm	"
	by end of Sep 81	± 3,000		Togiak NWR 1981 Rep.
Nanvak Bay	6 Oct 80	500	aerial survey for waterfowl	R. King
Cape Newenham, E of	8 May 81	24 +	hauled out on rocks; aerial survey	L. Lowry
	8 May 81	14	in water; aerial survey	"
Cape Newenham, S of	30 May - 15 Jun 75	present	3 minor haulouts; aerial survey for herring	R. Baxter
	30 May 75	50	"	"
	Aug 74	present	"	"
Security Cove	19 May 78	2	feeding, swimming	B. Dinneford
	20 May 82	19	"	D. Jonrowe/R. Baxter
Security Cove, SW corner	23 May 82	2	"	"
Security Cove	4 Aug 82	6	hauled out--usually no large concentrations, just individuals; aerial survey	L. Hotchkiss

Table 6., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Chagvan Bay	30 May - 15 Jun 75	moderate numbers	haulout; aerial survey for herring	R. Baxter
	17 Jun 77	150	"	D. Jonrowe
	Aug 74	moderate numbers	haulout	R. Baxter
	4 Aug 82	4	hauled out; usually no large concentrations, just individuals; aerial survey	L. Hotchkiss
WALRUS				
Walrus Islands	general	present	haulouts; High, Crooked, Summit, Black Rock, the Twins, Round Is.	USFWS/BB Manage. Plan Maps
	summer	± 1,000	hauled out throughout summer	Fay 1957
	12 Jul 73	3	aerial survey	K. Pitcher
	24 Jul 66	200		J. Vania
Hagemeister Is.	Jun 35	8		D. Gray
Hagemeister Is., S tip	30 May- 15 Jun 75	present	minor haulout; aerial survey for herring	R. Baxter
	Aug 74	present	"	"
Round and Hagemeister Is.	22 Jul 53	0		J. Brooks
High and Hagemeister Is.	12 May 58	0		J. Buckley
	29 May 58	0		R. Maheffey
High Is.	22 Jul 53	± 250		J. Brooks
Big (North) Twin Is.	12 May 58	300		J. Buckley
	29 May 53	± 600		R. Mahaffey
	30 May - 15 Jun 75	present	"moderate" haulout; aerial survey for herring	R. Baxter
	Jun 57	800-1,000		V. Crosby
	12 Jun 76	1,000+	hauled out; aerial survey	ADF&G herring survey
	25 Jun 58	2		C. Fiscus
	22 Jul 53	± 850		J. Brooks
	Aug 59	10		F. Goro

Table 6., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Big (North) Twin Is., cont.	Aug 74	present	"moderate" haulout; aerial survey for herring	R. Baxter
Crooked Is.	Jun 57	< 20		F. Fay
Round Is.	10 Feb 81	40		L. Lowry
	10 Mar 81	0		"
	week of 30 Mar 80	1,500	hauled out	K. Taylor
	2 Apr 77	0	aerial survey	H. Braham
	7 Apr 81	2-3,000	aerial survey for walrus	L. Lowry
	14 Apr 81	2,000 2-3,000	west side east side	F. Fay, RESOLUTION cruise
	16 Apr 80	3,000		L. Lowry
	23 Apr 68	1,000		J. Burns
	27 Apr 59	7		V. Crosby
	May 54	± 500		J. Dittmer
	May 55	"some"	+ female with calf near Cape Constantine	S. McCutcheon
	May 58	2,500		"
	6 May 59	7		V. Crosby
	7 May 77	1,660	hauled out	J. Faro
	7 May 81	5,000		L. Lowry
	8 & 14 May 58	± 50-55		V. Crosby
	12 May 58	1,300		J. Buckley
	27 May 58	2,500-3,000		V. Crosby
	27 May 80	7-8,000		L. Lowry
	29 May 53	± 400		R. Mahaffey
	Jun 57	3-400		V. Crosby
	Jun 58	350-1,500		F. Fay
	1 Jun 58	2,500		V. Crosby
	7-14 Jun 75	± 22	in water	R. Baxter

Table 6., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Round Is., cont.	11 Jun 77	6,089	hauled out	J. Faro
Round Is., N, E, & W sides	12 Jun 76	many	hauled out; aerial survey	ADF&G herring survey
Round Is.	13 Jun 77	5,773	hauled out	J. Faro
	17 Jun 59	3,076		V. Crosby
	19-29 Jun 58	1,500 - 2,000	adult and subadult males; on cobble beaches on NW side; aerial survey and ground photographs	Kenyon 1958
	24 Jun 77	238	hauled out	J. Faro
	27 Jun 80	11,600	maximum count for season	J. Taggart/C. Zabel, summer 1980 unpubl. rep.
Round Is., 4-5 mi S	26 Jun 58	± 50		C. Fiscus
Round Is.	29 Jun - 4 Jul 77	± 5-8,000	hauled out	USFWS/SBCS Rep. P. Arneson/ D. McDonald
	14 Jul 77	± 5-8,000	"	"
	Jul 74	± 3,000		G. Ray/F. Fay
between Round Is. and Big (North) Twin	6 Jul 57	2	in water	V. Crosby
Round Is.	9 Jul 77	1,372	hauled out	J. Faro
	12 Jul 73	1,000	aerial survey	K. Pitcher
	Aug 57	500		W. Sholes
	Aug 59	± 2,000		F. Goro
Round Is., S of	4 Aug 73	25	in water	R. Macintosh
Round Is.	5 Aug 80	11,600	maximum count for season	J. Taggart/C. Zabel, summer 1980 unpubl. rep.
	19 Aug 57	± 500		W. Sholes
	19-21 Aug 60	1,500-2,000		Burns 1965
	22 Aug 80	9,700		F. Fay
	Sep 72 or 73	"many"		F. Williamson

Table 6., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Round Is., cont.	22 Sep 76	5,210	maximum count for August-September	J. Taggart/C. Zabel, summer 1980 unpubl. rep.
Round Is. (base of spit and NW end)	7 Oct 81	900	hauled out; all males, many 10-15 yr +; boat survey	K. Frost/J. Burns
Round Is.	17 Oct 80	4-500		F. Fay
	11 Nov 70	± 525		J. Faro
	15 Nov 80	7-8,000		L. Lowry
Cape Peirce	summer 70	1	in water	M. Dick
Cape Peirce, E of	26 Jun 81	1	hauled out on rocks; aerial survey	D. Calkins
	late Nov 81	2,800	hauled out on beach	Togiak NWR 1981 Rep.
Cape Newenham, N, off Red Mountain	24 Apr 81	1	aerial survey	ADF&G herring survey
Cape Newenham, 1.5 mi NE	27 Apr 81	3	"	"
Cape Newenham, N side near Bird Rock	Apr-Jul 79, Apr & May 80, Apr 81	up to 400	hauled out until first week of July in 1979, discovered by hunters from Goodnews Bay in 1980, and regularly hunted since then--utilization decreasing	R. Baxter
Cape Newenham	8 May 79	25	hauled out; aerial survey	ADF&G herring survey
Cape Newenham, NE	17 May 78	400 +	hauled out; aerial survey for herring	D. Jonrowe
	20 May 78	± 250	some in water, some hauled out; aerial survey for herring	"
Cape Newenham	summer 81	< 200	hauling out regularly	K. Taylor
Cape Newenham, E of	Jun 78	450-500	hauled out on beach; aerial survey for herring	D. Jonrowe
	Jul 78	0	aerial survey for herring	"
Security Cove	May 78	25-30	hauled out on entrance bars	R. Tremaine
Platinum to Chagvan Bay	1 Oct 79	1	hauled out on beach; aerial survey for waterfowl	R. King

Table 6., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE				
Round Is., approx. 30 mi S	7 May 81	2		L. Lowry
Hagemeister Is., E side	15 Jun 75	1	feeding on capelin; aerial survey for herring	R. Baxter
NE Cape Newenham	20 May 78	2	cow and calf; aerial survey for herring	D. Jonrowe/R. Baxter
MINKE WHALE				
S Kulukak Bay	7-14 Jun 75	1	swimming W; boat survey for herring	R. Baxter
Hagemeister Is., S end	7-14 Jun 75	1	"	"
GRAY WHALE				
Kulukak Bay, E of	30 May 75	1	swimming NW along coast; aerial survey for herring	R. Baxter
	30 May 75	2	swimming W; aerial survey for herring	"
	30 May 75	10	swimming S; aerial survey for herring	"
	30 May 75	6	swimming W; aerial survey for herring	"
	30 May 75	1	"	"
	30 May 75	13	aerial survey for herring	"
Kulukak Bay, SW of	29 May 76	1	"	"
Kulukak Bay, E side	7 Jun 76	1	swimming W; aerial survey for herring	"
Kulukak Bay to Round Is.	late May 82	300 +	feeding during herring season	L. Hotchkiss
Right Hand Pt., W of	15 Apr 80	15-20		J. Strode
Right Hand Pt.	28 May 71	1	aerial survey	ADF&G herring survey
	29 May 68	1	"	"
Right Hand Pt., S of	30 May 75	2	swimming W; aerial survey for herring	R. Baxter
Right Hand Pt.	30 May 75	1	"	"
	30 May 75	4	"	"

Table 6., continued

Location	Date	Number	Comments	Source
GRAY WHALE, cont.				
Right Hand Pt., cont.	5 Jun 72	2	swimming W; aerial survey for herring	R. Baxter
Summit Is.	30 May 75	1	swimming NW; aerial survey for herring	"
Togiak Bay, W side	18 May 73	1	aerial survey for herring	ADF&G herring survey
	30 May 75	4	swimming SW along coast; aerial survey for herring	R. Baxter
	30 May 75	3	"	"
	30 May 75	10	aerial survey for herring	"
Hagemeister Is., E side	30 May 75	3	swimming SW along coast; aerial survey for herring	"
	30 May 75	1	swimming NE; aerial survey for herring	"
Hagemeister Is., N side	30 May 75	1	swimming SW; aerial survey for herring	"
Hagemeister Is., SE end	7-14 Jun 76	1	swimming SW; boat survey for herring	"
Hagemeister Is., SW of	7-14 Jun 75	1	swimming W; boat survey for herring	"
	7-14 Jun 75	1	swimming NNW; boat survey for herring	"
Tongue Pt. to Security Cove	summers 79-81	present	feeding, stay in area; usually 12-20 whales per pod	L. Hotchkiss
Black Rock to Round Is.	15 Apr 81	"many"		F. Fay, RESOLUTION cruise
Round Is.	14 Apr 81	"numerous"		"
Shaiak Is., 2 km NNE	23 Apr 81	1	approx. 200 m offshore	R. Gill
Cape Peirce, 2 mi SE	5 May 80	12		Clarence Rhodes NWR 1980 Rep.
Cape Peirce	8 May 81	4	swimming W, 500 m offshore; aerial survey	L. Lowry
Cape Peirce to Cape Newenham	20 May 77	8	moving W and N along coast; aerial survey for herring	L. Barton
Cape Peirce area	28 May 70	13	all moving W	M. Dick
	31 May	2		"
	6 Jun	2		"

Table 6., continued

Location	Date	Number	Comments	Source
GRAY WHALE, cont.				
Cape Peirce area, cont.	12 Jun	2	all moving W	M. Dick
	23 Jun	2		"
	26 Jun	1		"
	30 Jun	1		"
	1 Jul	5		"
	10 Jul	1		"
Cape Peirce, E of	30 May 75	4	swimming SW along coast; aerial survey for herring	R. Baxter
Cape Peirce, NW of	30 May 75	14	aerial survey for herring	"
	30 May 75	2	"	"
Cape Peirce, NE of	7-14 Jun 75	6	swimming SW along coast; aerial survey for herring	"
Cape Peirce, W of	7-14 Jun 75	1	swimming SSW; aerial survey for herring	"
Cape Peirce, E of	26 Jun 81	1	aerial survey	D. Calkins
	26 Jun 81	2	"	"
Cape Peirce, N of	27 Jun 73	2		W. Arvey
Cape Newenham	7 May 81	1	aerial survey	ADF&G herring survey
Cape Newenham, E of	8 May 81	1	"	L. Lowry
Cape Newenham	8 May 81	1	"	"
	9 May 81	1	"	ADF&G herring survey
Cape Newenham, 2-4 mi SE	9 May 81	2	"	"
Cape Newenham	30 May 75	3	swimming NW; aerial survey for herring	R. Baxter
	30 May 75	4	"	"
Cape Newenham, W & S sides	31 May 75	23	aerial survey	ADF&G herring survey
Cape Newenham, S of	7-14 Jun 75	3	swimming NW; aerial survey for herring	R. Baxter
	7-14 Jun 75	3	swimming W; aerial survey for herring	"
Cape Newenham	21 Jun 73	3	swimming N	W. Arvey
Chagvan Bay, about 15 mi W	24 May 81	present	aerial survey	Ljungblad et al. 1982

the Peninsula, including Cape Leontovich, Cape Leiskof, Bear River, and Cape Seniavin. In June 1975, 11,720 harbor seals were counted in this region; 94.5% (11,078) were at Izembek/Moffet and Port Moller.

The principal harbor seal hauling areas along the northeastern Alaska Peninsula occur at Ilnik, Seal Islands, Port Heiden, Cinder River, and Ugashik Bay. Most reported sightings are from May to August, with peak numbers in June and July. The largest number of seals counted in this area during a single survey (June 1976) was 16,119; of those, 65% (10,548) were in the vicinity of Port Heiden. Maximum counts at each area were: Ilnik - 3,200 (June 1971); Seal Islands - 3,500 (July 1968); Port Heiden - 10,548 (June 1976); Cinder River - 4,503 (June 1976); and Ugashik Bay - 438 (August 1976). The total of these maximum counts is 22,189. Very small numbers of harbor seals have been seen hauled out north of Ugashik Bay at Cape Greig and Egegik Bay.

There are no major harbor seal haulouts in northeastern Bristol Bay. A group was seen hauled out on a sandbar in Kvichak Bay in July 1973, and seals haul out fairly regularly on the southern Nushagak Peninsula at Protection Point and Cape Constantine. Individuals and small groups are occasionally seen in the water in Kvichak Bay and along the Nushagak Peninsula.

Harbor seals haul out at many locations in northwestern Bristol Bay, including Tvativak Bay; Hagemeister, Summit, High, and Crooked Islands; Black Rock; Nanvak Bay; Cape Newenham; Security Cove; and Chagvan Bay. The most important areas appear to be Hagemeister Island, Black Rock, and Nanvak Bay. In Nanvak Bay, by far the major hauling area, the ratio of harbor to spotted seals has been estimated at 9 to 1. Seal numbers there are low in April and May when ice may be present (generally less than 200), increase during June and July, and reach a peak in late August and September. From 2,000 to 3,000 seals have been reported in Nanvak Bay in August 1975 and 1981, and September 1975, 1979, and 1981.

Walrus

Although walruses have been occasionally reported from Unimak Island (Cape Sarichef and Otter Point) and Izembek Lagoon (Cape Glazenap), the areas regularly used along the southwestern Alaska Peninsula are Amak Island, Port Moller, and Cape Seniavin. Based on available reports, all animals seen in this region are males.

The presence of walruses on Amak Island was first reported in April 1962. The best documentation of their occurrence on Amak Island was in 1979 when they were seen on six occasions between 28 June and 6 September and were reported to be on the island until 1 November. The maximum estimated number was 500 on 28 June. Haulouts occurred on the east, southeast, and southwest sides of the island. No walruses were

seen on the island during 1980 (May to July), 1981 (March, April, and October observations), or 1982 (13 July observation).

Walruses were first reported hauled out near Port Moller in April 1968 and were reported there again in January-February 1969. Approximately 2-4,000 were in that area in April-May 1979, and several hundred were seen there on 6 and 27 May 1980. We have no reports of walruses near Port Moller in 1981; in 1982, four animals were seen on 21 April and none on 27 April or 3 May.

The first recent record of walruses at Cape Seniavin is from 23 April 1978. They were seen there in April-May 1979 and regularly from late March to 23 May 1980 and from 7-12 April 1981. Maximum estimated numbers were 1,000-5,000 in 1980 and 1,500-2,000 in 1981. No walruses were seen there on 21 and 27 April 1982.

Walruses are very infrequently seen along the northeastern Alaska Peninsula. Small numbers have been seen near Port Heiden, Cinder River, and Ugashik Bay. Sightings have occurred during May to October.

The principal hauling areas for walruses in northern Bristol Bay are in the Walrus Islands. We have located records of walruses hauled out on Hagemeister, High, Crooked, Big Twin, and Round islands. General information suggests that Summit Island and Black Rock are also used; however, we have found no records of sightings on those two islands. Big Twin Island and Round Island appear to be the only areas used regularly by substantial numbers of animals. Sightings of up to 1,000 animals have been made on Big Twin Island during summer months since 1953. The spit and beaches on the north end of Round Island are by far the most important hauling grounds for walruses in Bristol Bay. Maximum annual counts of animals have increased markedly from 4-500 in 1953-54 to 11,600 in 1980. The Round Island hauling area is used from March to November, with greatest numbers present in June to September.

Every year since 1978 walruses have been reported hauled out in the region between Cape Peirce and Security Cove. Most sightings have been on the north side of Cape Newenham. Most haulout activity seems to occur in April to June and usually involves from a few up to 500 animals. An unusually large sighting of 2,500 hauled out at Cape Peirce was reported in November 1981.

Belukha Whale

We have only two reports of belukha whales in the southwestern Alaska Peninsula region. On 13 April 1976, over 300 belukhas were seen in the pack ice northwest of Port Moller. A single animal was seen near Port Moller in July 1979. Local observers consider belukhas to be very uncommon along this part of the Alaska Peninsula.

Belukha whales have been seen on five occasions along the northeastern Alaska Peninsula during January to November. Two of the sightings were in the vicinity of Ugashik Bay in October and November.

Belukha whales are common in northeastern Bristol Bay. They are seen in the Naknek River from the river mouth to at least 27 km upstream. Whales are present in that area in April and May; most sightings have occurred in early April. Although the majority of sightings are of 2-20 animals, one record indicates over 200 animals in the Naknek River. Belukhas occur in the Kvichak River and Kvichak Bay from April to September. Sightings of hundreds of animals have been made in May, June, and August. In Nushagak Bay, belukhas have been reported to occur during April to August. They ascend the Nushagak River as far as Portage Creek and have frequently been seen at the mouths of the Wood, Snake, and Igushik rivers, particularly during June and July. During June to August 1954 and 1955, an estimated 250-450 belukhas were in the Nushagak Bay area.

We located only three sightings of belukha whales in northwestern Bristol Bay, all of of which occurred in the months of May and June.

Harbor Porpoise

Harbor porpoises were sighted on five occasions in the Port Moller-Cape Seniavin region during 1980 and 1981. Nine animals were seen on 18 April 1981. Sightings have occurred from 9 April through 14 June.

Harbor porpoises are reported as occurring commonly in low numbers in northern Bristol Bay during summer.

Minke Whale

We have located four sightings of minke whales along the Alaska Peninsula. Sightings have occurred during April and June.

Two sightings of minke whales in northwestern Bristol Bay were reported in June 1975.

Gray Whale

Gray whales are regularly seen moving along the coast of the southwestern Alaska Peninsula. They appear to occur every year in small numbers in and near the Nelson Lagoon/Port Moller area. They have been observed there between 18 April and 23 November. In the vicinity of Cape Seniavin, gray whales were seen moving northeastward along the coast in April 1980 and 1981 and were also seen on 14 June 1980.

Sightings of gray whales along the northeastern Alaska Peninsula have occurred between 11 April and 15 June. Most sightings have been very near the coast and near Port Heiden and Ugashik Bay. Reports indicate both feeding and northward movement.

Most sightings of gray whales in northeastern Bristol Bay have occurred near Cape Constantine in May.

Gray whales are commonly seen in northwestern Bristol Bay, particularly from mid-April until the end of June. They are seen both along the mainland coast and near offshore islands. The distribution of sightings indicates that migrating animals pass both along the east and south sides of Hagemeister Island and between the island and the mainland. Whales appear to pass particularly close to shore from Cape Peirce to Cape Newenham. Most sightings are of one or two animals, although groups of up to 20 have been reported. One observer estimated at least 300 gray whales in the area in late May 1982. There are no specific sightings of animals in the North Aleutian Basin area north of Cape Newenham.

Sea Otter

Sea otters have been reported along the entire southwestern portion of the Alaska Peninsula from Unimak Island to Port Moller. From 1949 through 1962 the vast majority of sightings were made in the Unimak Island/Bechevin Bay area and near Amak Island. One otter was seen near Izembek Lagoon on 13 October 1960. Otters appeared in Izembek in large numbers in 1965 but were temporarily reduced by heavy ice conditions in the early 1970's; none were seen there during the winter of 1973-74. Since 1978, regular sightings of several hundred to over 1,000 have been made in the Izembek/Moffet Lagoon area. Particularly large aggregations have been reported there from mid-June to mid-July. The area from Cape Mordvinof to Cape Leiskof constitutes the core of the sea otter range along the Alaska Peninsula. The total population is estimated at 17,173.

In 1981 and 1982, sea otters were reported from the Seal Islands and Port Heiden.

B. Saint George Basin (Figure 7; Table 7)

Steller Sea Lion

Sea lions haul out on St. George, St. Paul, Otter, and Walrus islands. The largest haulout is on Walrus Island, which in summer 1960 had 4-5,000 adults and about 3,000 pups. At that time (and since then to our knowledge), Walrus Island was the only Pribilof haulout which was used as a breeding rookery. On 13 April 1979, about 3,000 sea lions were seen hauled out there. On St. George Island, sea lions haul out during summer at Dalnoi Point, Red Bluff, and Tolstoi Point. Dalnoi Point is by far the largest of the three haulouts, with 2,500-3,000 animals reported. Red Bluff is used by about 500 sea lions and Tolstoi Point by about 100. Aleuts from the island say that some pups are present at Dalnoi Point. However, this report is unconfirmed. St. Paul Island has two haulouts: Sea Lion Rock, with about 200-500 nonbreeding males, and Northeast Cape, with about 50-70. The northeast side of Otter Island is used as a haulout in both winter and summer. The largest number reported to be hauled out there was 1,000 males on 9 April 1955. The most recent count we know of was on 13 April 1979 when 400 were present. In early May 1978, 500-800 were seen there. The total estimate for the Pribilofs, based on surveys from 1960 and earlier, is about 9,000.

Harbor Seals

Harbor seals are present around all of the Pribilof Islands, although little information is available for locations other than Otter Island. The only major haulout is on Otter Island. The seals there were counted in April 1979 and early May 1978, when 250-300 were present; in June-August 1974, when the maximum number was about 1,300; and in July 1978, when about 700 were hauled out. Pupping takes place there in June and July on all haulout areas; about 250 pups were born on the island in 1974. Harbor seals are present in small numbers on St. Paul and St. George islands. In summer 1982, 40-50 were hauled out on the rocks about 4 km east of Dalnoi Point on St. George Island.

Walrus

We know of two recent reports of walruses in the Pribilofs, both in April 1979. One apparently healthy adult male was hauled out on Walrus Island, and another moribund male was hauled out on Otter Island. In the 19th century, walruses were more numerous on these haulouts, particularly on Walrus Island.

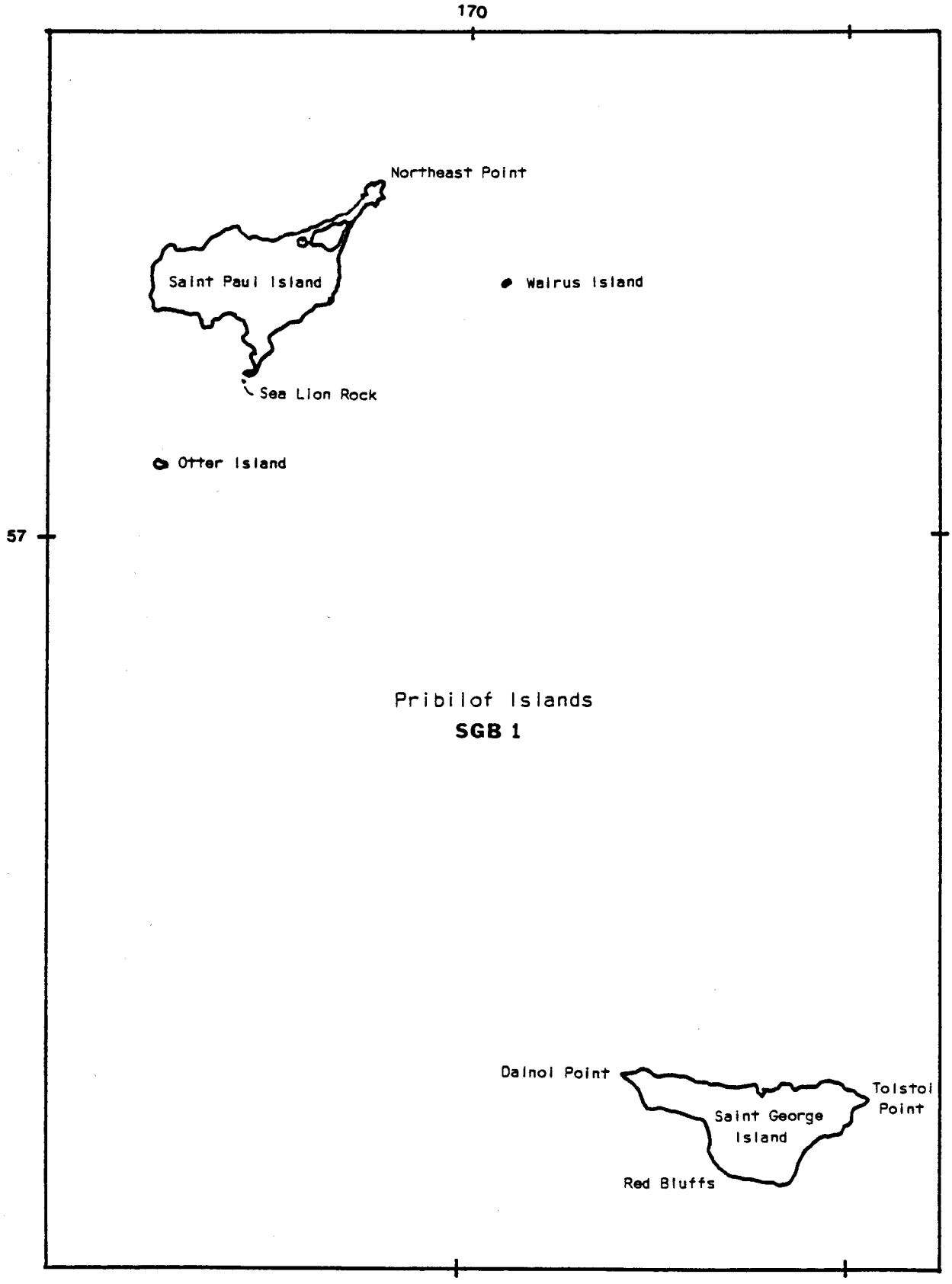

Figure 7. Map of the Saint George Basin, region SGB 1.

Table 7. Sightings of coastal marine mammals in the Pribilof Islands, Saint George Basin, region SGB 1.

Location	Date	Number	Comments	Source
STELLER SEA LION				
St. George Is., Dalnoi Pt.	summer	2,500-3,000	ADF&G Ref. #285	FEIS 1978
St. George Is., S shore Dalnoi Pt.	summer 82	present	local residents say there are pups here	K. Brink
St. George Is., Red Bluff	summer	500	ADF&G Ref. #286	FEIS 1978
St. George Is., Red Bluff (south rookery)	summer 82	many		K. Brink
St. George Is., Tolstoi Pt.	summer	100	ADF&G Ref. #287	FEIS 1978
	summer 82	present	hauled out	K. Brink
St. George Is.	summer 60	1,200	"	Kenyon and Rice 1961
St. Paul Is., NE Cape	summer	50	ADF&G Ref. #290	FEIS 1978
	summer	71	all males; no pups known to be born here since 1957	Kenyon 1962a
St. Paul Is., Sea Lion Rock	summer	30	ADF&G Ref. #290	FEIS 1978
	summer	200-500	hauled out here for many years	Kenyon 1962a
	summer 60	300	nonbreeding males	Kenyon and Rice 1961
Otter Is.	9 Apr 55	1,000	hauled out, N side of island, all identified were males	"
	13 Apr 79	400	hauled out	L. Lowry
Otter Is., NE side	22 Apr 77	200	70-80 hauled out; all adult males	J. Burns
Otter Is.	2 May 78	500	hauled out in "usual places;" aerial survey	"
	2 May 78	800	hauled out on N side; aerial survey	B. Kelly
	26 Jun 81	29	1 large bull	Pribilof Islands Program, Annu. Rep. 1981
	summer	100	ADF&G Ref. #288	FEIS 1978
	summers	75-160	hauled out; adult and subadult males	Kenyon and Rice 1961
	summer 60	160	aerial survey	"
	Jun-Aug 74	40-60	hauled out on N beach; bachelor males; about 200 there in early June	B. Johnson
	Jul 78	6-34	hauled out on NE side; males and a few subadult females	B. Kelly

Table 7., continued

Location	Date	Number	Comments	Source
STELLER SEA LION, cont.				
Otter Is., NE side	12 Aug 73	common	hauled out	J. Burns
	winters	large numbers	regular winter haulout; from residents	Kenyon and Rice 1961
Walrus Is.	13 Apr 79	3,000	hauled out	K. Frost
	22 Apr 77	1,500-2,000	all ages and both sexes	J. Burns
	summer	5,000	ADF&G Ref. #291	FEIS 1978
	summer 54	6-7,000	includes 2,797 pups; aerial photo survey	Kenyon 1962a
	summer 60	7-8,000	includes 2,866 pups; aerial photo survey	"
	4 Aug 81	1,172	30 adult males, 850 females and subadult males, 292 pups; land census	Pribilof Islands Program, Annu. Rep. 1981
HARBOR SEAL				
Pribilof Islands	mid-May - mid-Jul	present	main pupping season	Scheffer 1977
St. George and St. Paul islands	general	present	small numbers	B. Johnson
St. George Is.	30 May	present	peak of pupping season	Scheffer 1977
St. George Is., about 2 mi E of Dalnoi Pt.	summer 82	40-50	hauled out	K. Brink
St. Paul Is.	15 Jun 44	1	adult female with fetus; collected	Scheffer 1977
	23 Jul 50	1	male pup	"
Otter Is.	13 Apr 79	± 250	hauled out on N side	K. Frost
	2 May 78	300	"	J. Burns
	10 Jun 47	2	male pups; taken alive on pupping beach	Scheffer 1977
	11 Jun - 26 Aug 74	± 1,300	hauled out on reefs along N shore and at base of cliffs on S shore; pupping June and July, about 250 pups born	B. Johnson
	26 Jun 81	119	15 mother/pup pairs; high tide	Pribilof Islands Program, Annu. Rep. 1981

Table 7., continued

Location	Date	Number	Comments	Source
HARBOR SEAL, cont.				
Otter Is., cont.	8-30 Jul 78	707 max.	hauled out, most on NE side (593 max.); few on S shore (114 max.) and W end; pupping on all haulout areas	B. Kelly
	14 Jul 53	present	saw 25-lb. pup nursing	Scheffer 1977
	12 Aug 73	500 +	in water and hauled out on rocks on N side	J. Burns
	16 Aug 75	200 +	several colonies; at least 200 seals visible at any one time	USFWS/SBCS Rep., J. E. Benson
WALRUS				
Otter Is.	13 Apr 79	1	moribund, hauled out	K. Frost
Walrus Is.	13 Apr 79	1	adult male, hauled out	L. Lowry
HARBOR PORPOISE				
St. George Is.	Feb 1917	1	dead	Prescott and Fiorelli 1980
St. Paul Is., W of	11 May 76	5	vessel survey	Braham et al. 1977a
St. Paul Is.	3 Jun 1890	present		Murie 1959
	19 Jul 1916	1	dead	Prescott and Fiorelli 1980
GRAY WHALE				
Pribilof Islands	summer mid-70's	several	seen on aerial surveys	Braham et al. 1977a
St. George Is. area	summer 65	several		Rice and Wolman 1971
	summer 68	several		"
SEA OTTER				
St. George Is.	1968	55	transplanted	Schneider 1981
	1976	6	no pups seen	"
St. George Is., Dalnoi Pt.	summer 82	3	2 with pups	K. Brink

Table 7., continued

Location	Date	Number	Comments	Source
SEA OTTER, cont.				
St. Paul and Otter islands	1972-74	few sightings 1-2 otters		Schneider 1981
Otter is.	summer 74	1		B. Johnson
	July 78	none		B. Kelly
St. Paul is., NE Pt. and Marunich	summer 81	3	3 sightings of individual otters	Pribilof Islands Program, Annu. Rep. 1981

Gray Whale

Gray whales were sighted and reported in the St. George Island area and around the Pribilofs during summer 1965, 1968, and the mid-1970's.

Sea Otter

Fifty-five sea otters were transplanted to St. George Island in 1968, but only six were sighted in 1976. There were no pups present. In 1972-74, a few sightings were made of one to two otters near St. Paul and Otter islands. In summer 1982, three otters were regularly seen near Dalnoi Point. Two of those had pups with them.

C. Saint Matthew-Hall Basin (Figures 8-10; Tables 8-11)

Steller Sea Lion

There are no known sea lion haulouts on the mainland coast of the Saint Matthew-Hall Basin.

All reported sea lion haulouts on Nunivak Island are on the south side between Cape Mohican and Cape Mendenhall. Sightings have been made from May to October. The two main haulouts are at the mouth of Binajoaksmiut Bay, where up to 50 have been seen, and Nabangoyak Rock, where a maximum of 35 has been counted. In July 1978 a few sea lions were hauled out at Datheekook Point and Cape Mohican.

Sea lions are known to haul out on St. Matthew, Hall, and Pinnacle islands in spring through autumn. The largest reported sightings were of over 100 at Cape Upright on St. Matthew in August 1960, of 350 (no pups) south of Elephant Rock on Hall Island in August 1957, and of 100 and 150-200 on Pinnacle Island in March 1979 and September 1980. Systematic observations made in 1982 indicate that sea lions are present near St. Matthew Island from late May until at least early August. Peak numbers were observed during July.

Spotted/Harbor Seals

The principal haulouts of spotted/harbor seals in Kuskokwim Bay are on the sandbars off Quinhagak and in the mouth of the Kuskokwim River. Reported sightings have been in May-July. Maximum counts off Quinhagak were made in mid-May 1978, when about 2,200 were seen on Pilot Bar, 3,000 on Middle Bar, and 2,500 on North Bar. Approximately 2,000 harbor seals, many with pups, were seen at the mouth of the Kuskokwim in early July 1972. Other areas where smaller numbers of seals haul out in May-August include Chagvan Bay, Goodnews Bay, and Kongiganak.

Seals are present year-round on Nunivak Island and are most common in two regions: the northwest end near Cape Mohican and the southeast coast near Cape Mendenhall. On the northwest end, sightings of up to 20-70 seals have been made at Kigoumiut Bay, Mikisagimiut, the bays east of Ikook Point, and Ikookstakswak Cove. Approximately 80 seals were present in small rocky coves near Cape Mendenhall in October 1980. Spotted seals are present and hunted near Mekoryuk in April-June. It is unknown whether seals seen at the northwestern end were harbor seals or spotted seals. Four animals collected near Cape Mendenhall in October 1981 were all harbor seals.

Spotted seals are present along the mainland coast from Kipnuk to the mouths of the Yukon River. Sightings have been reported from Kipnuk, Etolin Strait, Hooper Bay, Tanunak, Scammon Bay, and the middle

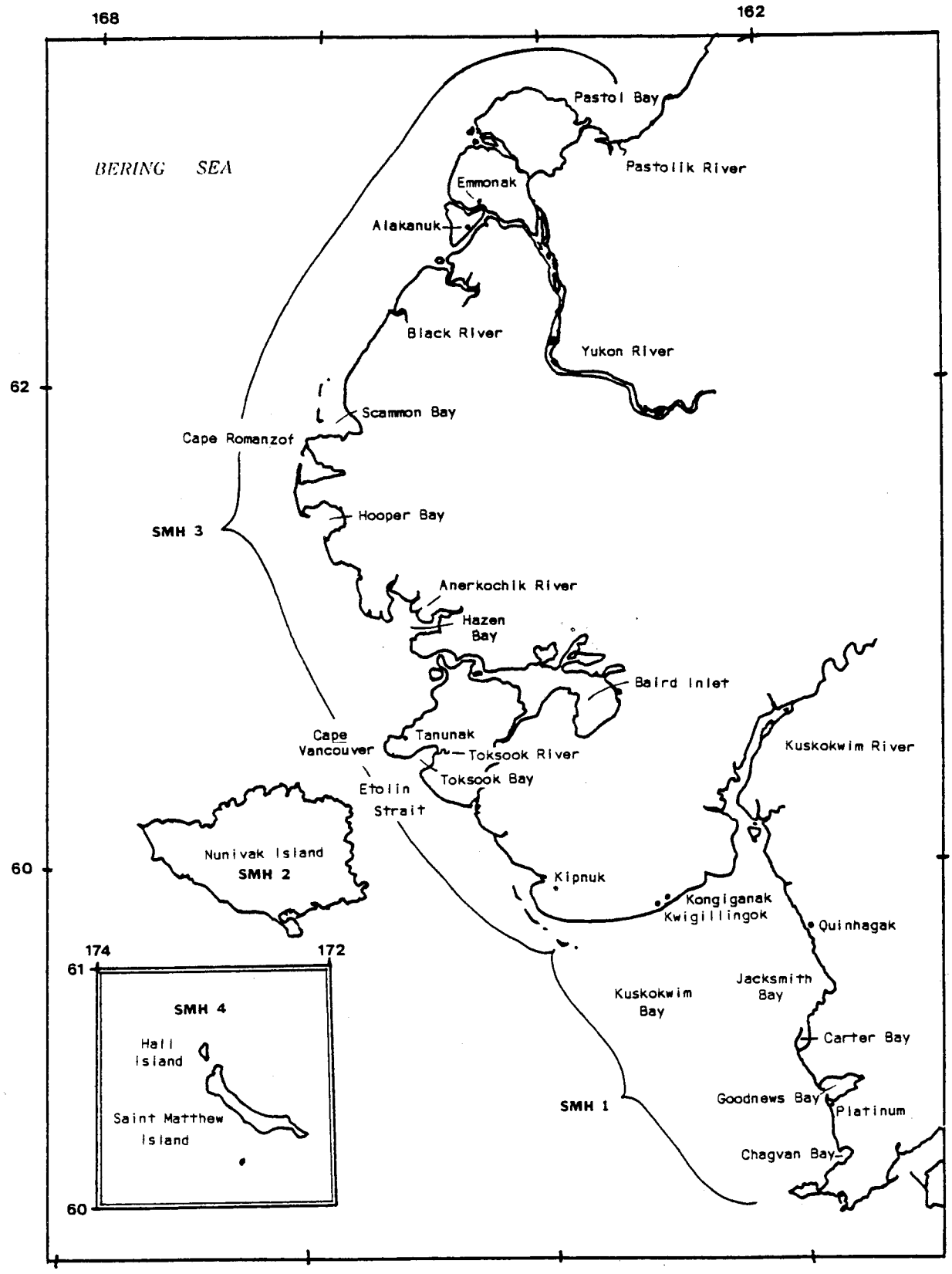

Figure 8. Map of the Saint Matthew-Hall Basin planning area showing subdivisions used in data compilation.

Table 8. Sightings of coastal marine mammals in the Saint Matthew-Hall Basin, region SMH 1.

Location	Date	Number	Comments	Source
SPOTTED SEAL/HARBOR SEAL				
Goodnews Bay	May 73	present	spotted seals; pups present; large numbers not present around here	W. Arvey
	17 May 78	± 15	aerial survey for herring	D. Jonrowe/R. Baxter
	17 Jun 77	25	hauled out; aerial survey for herring	D. Jonrowe
Quinhagak	14-16 May 73	present	spotted seals with white-coated pups	W. Arvey
Quinhagak, outer Jacksmith Bay	17 Jun 77	2,000 +	aerial survey for herring	D. Jonrowe
Quinhagak, SW of	10-13 Jul 73	present	on sandbars; most or all harbor seals; pups present	W. Arvey
Quinhagak, SW, Pilot Bar	17 May 78	± 2,200	aerial survey for herring	D. Jonrowe/R. Baxter
	20 May 78	± 2,000	no pups; aerial survey for herring	"
Quinhagak, W, Middle Bar	17 May 78	± 3,000	aerial survey for herring	"
	20 May 78	± 1,500	"	"
Quinhagak, W, North Bar	17 May 78	± 400	"	"
	20 May 78	± 2,500	"	"
Kongiganak, bar S of	17 May 78	50	hauled out; aerial survey for herring	"
Kuskokwim River mouth	Jun-Jul	present	harbor seals pup on bars in river mouth	R. Baxter
	4 Jul 72	± 2,000	on sandbars; harbor seals, many with pups; some up Kuskokwim to Akiachak; aerial survey for herring; this area was used heavily during salmon season	"
WALRUS				
Carter Bay, N end	24 Apr 81	1	aerial survey	ADF&G herring survey
Goodnews Bay	17 May 78	1 male	aerial survey for herring	D. Jonrowe/R. Baxter
Goodnews Bay, mouth of	Nov 78	200-250	hauled out for approximately 2 weeks on beach	D. Jonrowe
Kwigillingok, SW of	Jun 68	± 500	hauled out; aerial survey for herring	R. Baxter

Table 8., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE				
Quinhagak	1 May - 15 Nov	present		Lensink 1961
	circa 1955, summer	"many"	with calves	R. Tremaine, from residents
	summer 77	1	harvest	R. Nelson
	summer 78	few adults	2-5 harvested, one with 24" fetus	R. Tremaine, from residents
Kuskokwim River, off mouth	Jan 1879	present		Nelson 1887
HARBOR PORPOISE				
Quinhagak	4 Jul 72	many	aerial survey for herring	R. Baxter
GRAY WHALE				
Goodnews Bay, N of	17 May 78	1	chasing ball of herring; aerial survey for herring	D. Jonrowe/R. Baxter
Quinhagak	4 Jul 72	1	aerial survey for herring	R. Baxter
Kwigillingok, 20 mi SW	30 May 81	5	aerial survey; headed N-NW; mud trail visible	Ljungblad et al. 1982

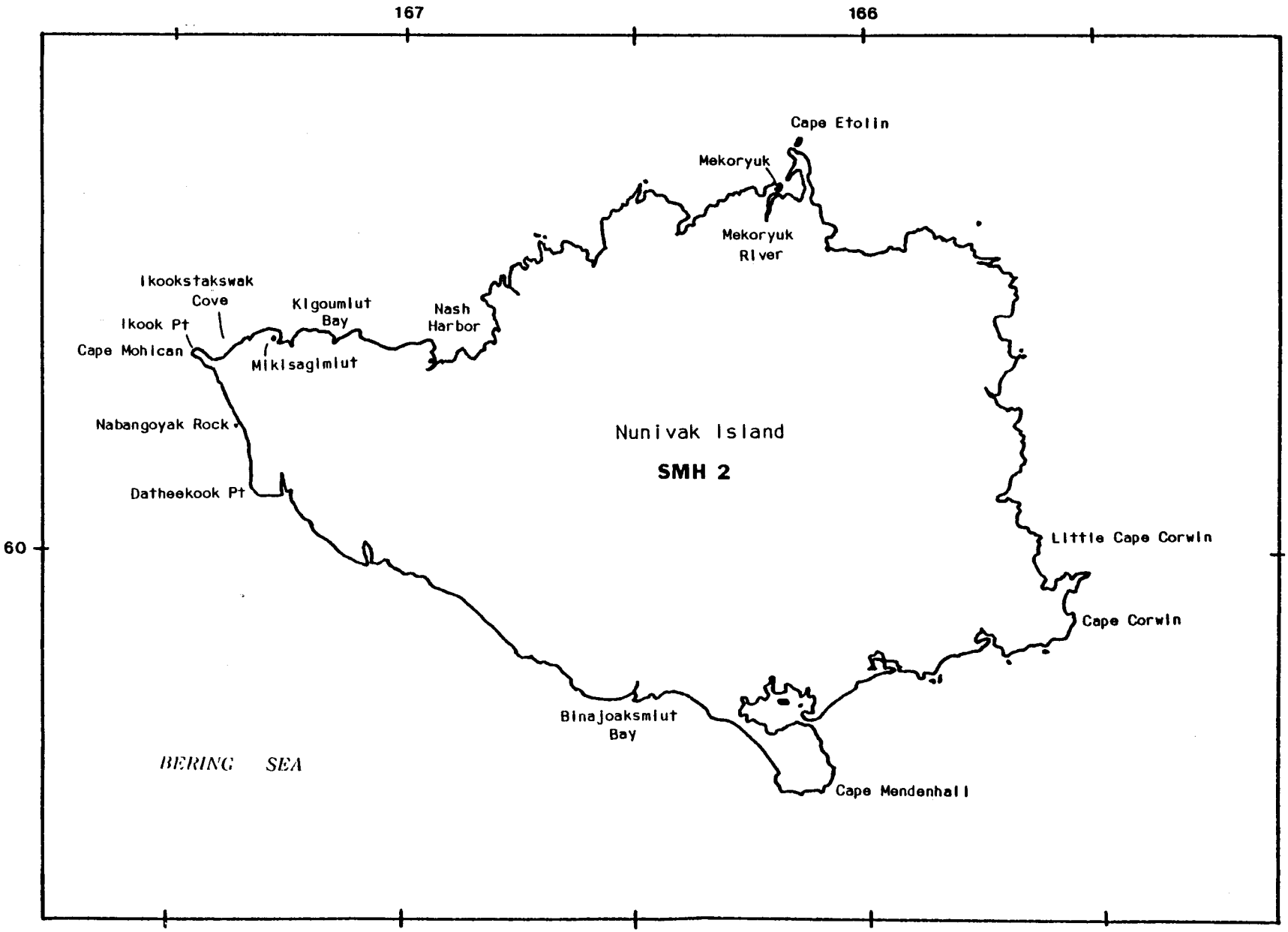

Figure 9. Map of the Saint Matthew-Hall Basin, region SMH 2.

Table 9. Sightings of coastal marine mammals around Nunivak Island in the Saint Matthew-Hall Basin, region SMH 2.

Location	Date	Number	Comments	Source
STELLER SEA LION				
Nunivak Is.	Feb-Mar 60	none	aerial survey	Kenyon and Rice 1961
Nunivak Is., S side	30 May 81	15-20	hauled out on rocks; aerial survey	K. Frost
Nunivak Is., W side	spring and especially summer	present		Kenyon and Rice 1961
Binajoaksmiut Bay, mouth of	5 Jun 79	49	on rocks and in surrounding water; one of two main sea lion haulouts on island	Clarence Rhodes NWR 1979 Annu. Rep.
Nabangoyak Rock	Jun 78 - Aug 79	32 max.	haulout area--only two main ones on island	"
	4 Jul 78	10		Ritchie 1978
	11 Jul 78	35		"
Datheekook Pt.	11 Jul 78	7		"
Cape Mohican	11 Jul 78	1		"
Cape Mendenhall, 20 mi W	4-5 Oct 81	50	hauled out; only sea lions seen during 2 days spent in area; boat survey	K. Frost/J. Burns
SPOTTED SEAL/HARBOR SEAL				
Mekoryuk	Apr-Jun 75	present	hunted; spotted seals	ADF&G harvest records
Nunivak Is., S side	30 May 81	1	in water; aerial survey	K. Frost
	30 May 81	3	"	"
Nash Harbor	30 May 81	1	"	"
Cape Mohican	spring-summer	present		C. Lensink
Nunivak Is., islets off SE coast	Jun-Sep 79	stable number	usually present all year unless heavy ice	Clarence Rhodes NWR 1979 Annu. Rep.
Kigoumiut Bay	Jun-Sep 79	stable number	"	"
Mikisagimiut	Jun-Sep 79	some		"
	3 Jul 78	present	"observed frequently after this date"	Ritchie 1978

Table 9., continued

Location	Date	Number	Comments	Source
SPOTTED SEAL/HARBOR SEAL. cont.				
Ikookstakswak Cove	Jun-Sep 79	stable number	usually present all year unless heavy ice	Clarence Rhodes NWR 1979 Annu. Rep.
	2 Jul 78	45 +	hauled out on rocks	Ritchie 1978
	6-9 Jul 78	20 +	hauled out	"
Ikook Pt., all three bays E of	22-23 Sep 80	70	aerial survey	USFWS Walrus Survey maps
Cape Mendenhall	4 Oct 81	80	harbor seals; in coves near cape; boat survey	J. Burns
	5 Oct 81	20	"	"
WALRUS				
Etolin Strait	spring	many	major migration route	Clarence Rhodes NWR 1979 Annu. Rep.
Nunivak Is., N side	Oct 78	"hundreds"	hauled out	R. Tremaine
	Nov 78	"hundreds"	"	T. Smith
Cape Etolin and Mekoryuk	3 weeks in Nov & Dec 78	groups of 200 +, sightings common	hauled out on rocks; unusually large number for that time of year	Nunivak NWR 1978 Annu. Rep.
	fall 78	some	hauled out for 3-4 weeks on beach	D. Jonrowe
BELUKHA WHALE				
Nunivak Is.	autumn, before 1930	present	occasionally caught in seal nets	Curtis 1930
HARBOR PORPOISE				
Little Cape Corwin	4-6 Jun 79	16	feeding on abundant capelin; with minke whales; boat survey	Clarence Rhodes NWR 1979 Annu. Rep.
Nunivak Is., S side	July (72?)	"few"		R. Baxter
MINKE WHALE				
Little Cape Corwin	4-6 Jun 79	4	feeding on abundant capelin; with harbor porpoise; boat survey	Clarence Rhodes NWR 1979 Annu. Rep.

Table 9., continued

Location	Date	Number	Comments	Source
MINKE WHALE, cont.				
Cape Mendenhall, E of	4 Oct 81	1	within 1/4-1/2 mi of shore; boat survey	K. Frost
	5 Oct 81	6	"	"
GRAY WHALE				
Cape Mendenhall	7 May 81	5	swimming NW; aerial survey for herring	R. Baxter
Cape Mendenhall, NW of	7 May 81	2	"	"
Cape Mendenhall, 6 mi W	11 May 81	7	aerial survey	ADF&G herring survey
Cape Mendenhall	30 May 81	1	"	Ljungblad et al. 1982
	30 Jun 72	2	aerial survey for herring	R. Baxter
Nunivak Is., S side	7 May 81	2	swimming NW; aerial survey for herring	"
	7 May 81	3	"	"
	7 May 81	7	"	"
	1-5 Jun 79	12	feeding (?) near rocky shore; boat survey	Clarence Rhodes NWR 1979 Rep.
	11 Jun 76	3	swimming W; aerial survey	ADF&G herring survey
	Jul 72	2	aerial survey for herring	R. Baxter
Nunivak Is., SW end	7 May 81	1	swimming NW along coast; aerial survey for herring	"
	7 May 81	7	"	"
	7 May 81	4	"	"
Nunivak Is., W side	11 Jun 76	1	swimming N; aerial survey	ADF&G herring survey
Cape Mohican	7 May 81	1	swimming NW along coast; aerial survey for herring	R. Baxter
Cape Mohican, 7 mi S	11 May 81	2	aerial survey	ADF&G herring survey
Nunivak Is., N side	11 Jun 76	1	swimming NW; aerial survey	"
Mekoryuk River, mouth	25 Jun 78	1	20+ ft long	Ritchie 1978
Nunivak Is., E side	11 Jun 76	1	swimming N; aerial survey	ADF&G herring survey

Table 10. Sightings of coastal marine mammals in the Saint Matthew-Hall Basin, region SMH 3.

Location	Date	Number	Comments	Source
STELLER SEA LION				
Scammon Bay	20 May 81	1		J. Burns, Jr.
SPOTTED SEAL				
Kipnuk	Jul 73	few	scarce in summer until August, when they come down from N	W. Arvey
	spring - summer	present	haul out on offshore sandbars	C. Lensink
	spring-summer	many	"	J. Burns
Etolin Strait	late May 73	"many" present	spotted seals	W. Arvey
Baird Inlet to Hooper Bay	7 Jul 77	none	aerial survey for shorebirds	R. Gill/C. Handel
	12 Jul 79	none	"	"
	16 Jul 78	none	"	"
	2 Aug 79	none	"	"
	27 Aug 79	none	"	"
	6 Sep 78	none	"	"
	7 Sep 80	none	"	"
	20 Sep 79	none	"	"
	30 Sep 79	none	"	"
	3 Oct 81	none	"	"
	4 Oct 80	none	"	"
Tanunak	late May 73	present	spotted seals, pups present; peak hunting is in early May; seals move N in late May and early June	W. Arvey
	summer	present	present during herring runs, also through summer	"
Hooper Bay	Jan 77	present	harvested by residents	ADF&G harvest data
	Jan-Dec 75	present	"	"
	28 Jan 78	1 killed	female, tag return; tagged 12 Apr 71--57°48'N, 121°21'W	ADF&G files, Nome
	open-water months	present	haul out on extensive mud bars in this area	J. Burns

Table 10., continued

Location	Date	Number	Comments	Source
SPOTTED SEAL, cont.				
Hooper Bay, cont.	Mar-Nov 73	present	harvested by residents	ADF&G harvest data
	Mar-Nov 76	present	"	"
	Apr-Nov 74	present	"	"
	May-Dec 77	present	"	"
Dall Pt.	ice-free months	present	haul out on numerous rocks in this area	J. Burns
Scammon Bay, sandbars	Jun-Jul 78	± 1,000	hauled out	R. Pegau, from residents
Scammon Bay, offshore islands and sandbars	Jun	present	follow herring runs	W. Arvey
Yukon River, middle mouth	summers	some	hauled out on island	J. Burns, from resident
Yukon River	late summer, autumn	present	hunted in river	Wolfe 1981
Yukon R. to Kuskokwim R. mouth	general	--	no regular haulouts or rookeries	M. Smith
Black R., S of, to Pastol Bay	late summer, autumn	present	hunted by villagers from Sheldon Pt., Alakanuk, Emmonak, Kotlik	Wolfe 1981
WALRUS				
Kipnuk to Toksook Bay	14 Jun 77	40		L. Henslee
Cape Vancouver (Toksook R.)	Oct 78	present	hauled out	R. Tremaine
Anerkochik River - 1 mi up from mouth	1st week Jun 79	3		M. Smith
BELUKHA WHALE				
Kuskokwim River to St. Michael	midsummer-autumn	present	especially just offshore of mouths of Yukon	Nelson 1887
Kipnuk	spring	present	adults with young along coast; used to be large numbers (50 years ago)	R. Tremaine, from residents (1979)
Toksook Bay	fall 78	12 taken in fall hunt	"first time belukhas taken in 15 years"	R. Tremaine, from residents
Tanunak area	28 May 73	3		W. Arvey

Table 10., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
Tanunak	Aug 79	present	in bay north and east of Tanunak during summer	R. Tremaine, from pilot in area
	autumn 78	present	12 harvested	ADF&G harvest data
Hazen Bay	spring	many	many at spring breakup	R. Tremaine, from residents of Tanunak
Hooper Bay	spring	present	no large pods this area since WW II	R. Tremaine, from residents
	spring - early summer	present	appear with king and chum salmon runs	T. Ponaganuk, resident Hooper Bay
	26 May - 12 Nov	present		Lensink 1961
	summer 77	present	30 reported taken by local residents	Seaman and Burns 1981
	summer 79	present	23 reported taken by local residents	"
Cape Romanzof	20 May 78	6 +	aerial survey for herring	D. Jonrowe/R. Baxter
Cape Romanzof area	20 May 78	79	"	"
Cape Romanzof, NE of	20 May 78	6 +	"	"
Black R. to Pastol Bay	late summer, autumn	present	hunted by villagers from Sheldon Pt., Alakanuk, Emmonak, and Kotlik	Wolfe 1981
Emmonak	May-Jun 80	present	3-4 taken in commercial fishery	J. Burns, Jr.
Yukon River, N, middle, and S mouths	May & Jun	large numbers	concentrated during salmon runs	C. Hunt
Yukon River, off mouth	13 Jul 81	100 +	feeding; aerial survey	D. Ljungblad
Yukon R. to Norton Sound	13 Jul 81	8-10	"	"
Yukon Delta, shallow waters of	last half Sep, early Oct	large numbers	feeding on tomcod	C. Hunt
Yukon estuary	8-14 Jun 76	18	mean group size of 1.6; aerial survey	Braham et al. 1980
Pastol Bay, W end	20 Jun 75	1		Harrison and Hall 1978
Pastol Bay, outer	12 Jul 81	present	aerial survey	Ljungblad et al. 1982
Pastol Bay	spring/ autumn	present	important hunting area	Ray 1964, 1975

Table 10., continued

Location	Date	Number	Comments	Source
HARBOR PORPOISE				
Hooper Bay	no date	1	"Probably also in Toksook and Kokechik bays and around Nunivak Island"	C. Hunt *
Alakanuk	28 May 81	1	caught in salmon net	B. Dinneford
GRAY WHALE				
Cape Vancouver	17 May 81	1	aerial survey	ADF&G herring survey

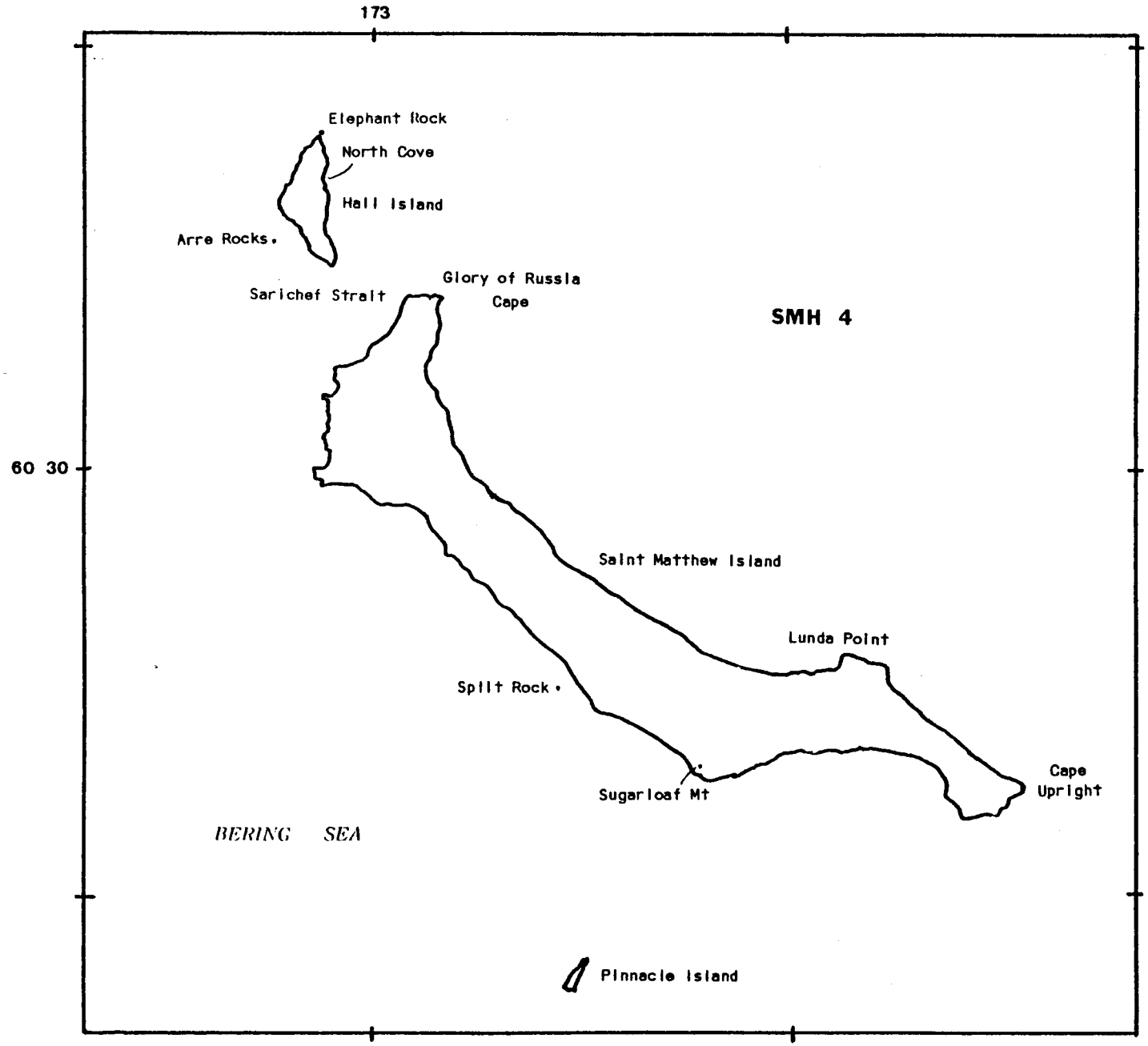

Figure 10. Map of the Saint Matthew-Hall Basin, region SMH 4.

Table 11. Sightings of coastal marine mammals on St. Matthew, Hall, and Pinnacle islands in the Saint Matthew-Hall Basin, region SMH 4.

Location	Date	Number	Comments	Source
Pinnacle Is.	26 Jul 76	no marine mammals		USFWS/SBCS Rep., C. Handel
STELLER SEA LION				
St. Matthew and Hall islands	8-14 Jul 1916	none		Hanna 1920
	Feb-Mar 60	none	aerial survey	Kenyon and Rice 1961
	summer	"several hundred"	arrive after mid-July	"
	summer 82	400-500		USFWS 1982 Field Party, A. Sowls
St. Matthew Is., S of Sugarloaf Mountain	22 May 82	50	in water	USFWS Field Party
St. Matthew Is., E of offshore rock near Lunda Pt.	5 Jun 82	1		"
St. Matthew Is., rock offshore of Cape Upright	8 Jun 82	90	maximum number seen; site used regularly	"
St. Matthew Is., N of Lunda Pt. on offshore rock	23 Jul 82	52	"	"
St. Matthew Is., Split Rock	28 Jul 82	20		"
St. Matthew Is., SE of westernmost point	28 Jul 82	13	on small offshore rock	"
St. Matthew Is., Cape Upright	2 Aug 60	100 +	hauled out	Kenyon and Rice 1961
Hall Is., Three Rivers	9 Jul 77	4	2 males on rocks, 1 female on beach, 1 male in water	USFWS/SBCS Rep., A. Degange/A. Sowls
Hall Is., Arre Rocks	16 Jul 82	150		USFWS Field Party
Hall Is., North Cove	2 Aug 82	75	on offshore rocks	"
Hall Is., 2 mi S Elephant Rock	9 Aug 57	350	hauled out; no pups; all adults or subadults	Kenyon and Rice 1961
Pinnacle Is.	16 Mar 79	100	hauled out on rocky beach; aerial survey	B. Kelly
	22-23 Sep 80	150-200	aerial survey	USFWS Walrus Survey maps
SPOTTED SEAL				
St. Matthew Is.	summer 82	400-500		USFWS Field Party

Table 11., continued

Location	Date	Number	Comments	Source
SPOTTED SEAL, cont.				
St. Matthew Is., E of Sugarloaf Mountain	2 Jul 82	300	maximum number seen; site used regularly; at river mouth	USFWS Field Party
St. Matthew Is.	18 Jul 77	± 17	hauling area	USFWS/SBCS Rep., A. Degange/A. Sowls
St. Matthew Is., E of Sugarloaf Mountain	18 Jul 82	100	maximum number seen; site used regularly; offshore rock	USFWS Field Party
St. Matthew Is., S end Lunda Pt.	20 Jul 77	present	hauling area	USFWS/SBCS Rep., A. Degange/A. Sowls
St. Matthew Is., Walrus Cove	28 Jul 82	4	maximum number seen; regularly saw seals < 100 m from shore	USFWS Field Party
St. Matthew Is., westernmost point	28 Jul 82	6	in water	"
St. Matthew Is., point SE of Lunda Pt.	30 Jul 82	18	on offshore rock	"
St. Matthew Is., E of Lunda Pt.	30 Jul 82	28	on intertidal reef	"
St. Matthew Is., Cape Upright	13 Aug 73	22	hauled out and in water; one collected was a spotted seal	J. Burns
St. Matthew Is., cape W of Cape Upright	22-23 Sep 80	200	hauled out; aerial survey	USFWS Walrus Survey maps
Hall Is., SW side	9 Jul 77	100 +		USFWS/SBCS Rep., A. Degange/A. Sowls
WALRUS				
St. Matthew Is.	27 May 78	2	males; halfway up N side; aerial survey	F. Fay
St. Matthew Is. near Cape Upright	autumn 81	110	on beach; hauled out	Alaska Maritime NWR 1981 Rep.
St. Matthew Is., Walrus Cove (W of Cape Upright)	summer 82	160	maximum count; hauled out; observed feeding nearby	D. Irons
St. Matthew Is., S of Glory of Russia Cape	22-23 Sep 80	80	in water; aerial survey	USFWS Walrus Survey maps
St. Matthew Is., Lunda Bay	summer 82	180	hauled out; maximum count; observed feeding nearby	D. Irons
Hall Is.	22-23 Sep 80	60 in water 550 hauled out	aerial survey	USFWS Walrus Survey maps

Table 11., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Hall Is., North Cove	Jul-Aug 82	80	maximum count, 5 censuses	D. Irons
GRAY WHALE				
St. Matthew Is. area	27 Jun - 25 Jul 77	8 sightings of 12 individuals	most traveling N or NW; 1 (16 Jul) traveling S	USFWS/SBCS Rep. A. Degange/A. Sowls
Sarichef Strait (between St. Matthew and Hall islands)	3 Aug 60	4		Rice and Wolman 1971
St. Matthew/Hall Is. area	summer 82	present	"observed frequently in late May and early June, often feeding < 1 km from shore"	D. Irons

mouth of the Yukon. The largest reported sighting was of about 1,000 seals hauled out on the sandbars near Scammon Bay in June-July 1978. At Tanunak and Scammon Bay, spotted seals arrive during the herring runs and remain through the summer. At Hooper Bay, spotted seals are hunted by local residents in all months of the year but are taken in greatest abundance in July through October.

Both St. Matthew and Hall islands have been reported as hauling areas for spotted seals during summer and autumn. About 100 seals were hauled out on the southwest side of Hall Island in July 1977. The largest number reported from St. Matthew was 250-300 hauled out on the rocks and islands to the east of Sugarloaf in summer 1982. About 200 were seen west of Cape Upright in September 1980.

No confirmed sightings or collections of harbor seals have been made at St. Matthew Island. However, it is probable that they are occasionally present in late summer and autumn.

Walrus

Walruses occasionally haul out in Kuskokwim Bay. In November 1978 several hundred hauled out for about 2 weeks on the beach at the mouth of Goodnews Bay. About 500 were reported at Kwigillingok in June 1968. A single animal was seen at Carter Bay in April 1981. North of Kuskokwim Bay, walruses were sighted three times from 1977 through 1979, twice in June and once in October. The largest sighting was of 40 animals along the coast from Kipnuk to Toksook Bay in June. Other sightings were at Cape Vancouver and about 2 km up the Anerkochik River.

Walruses haul out in summer and autumn on both St. Matthew and Hall islands. In September 1980, over 500 were hauled out on Hall Island. On St. Matthew, groups of about 100 have been reported near Glory of Russia Cape, Cape Upright, and Lunda Bay. In summer 1982, haulouts at Walrus Cove and Lunda Bay were used continuously by up to 160-180 walruses on each.

Belukha Whale

In Kuskokwim Bay in recent years, belukhas have only occasionally been sighted near Quinhagak. A few were seen and hunted there in summer 1977 and 1978. In the early to mid-1900's they were reportedly common near Quinhagak, Goodnews Bay, and Jacksmith Bay.

*Belukhas are present around Nunivak Island during the ice-free months, but the degree of use at different times of the year is unclear. They may be more common around the island during autumn when there is a tendency for the whales to use offshore waters. Historically, belukhas were occasionally caught during autumn in nets designed to catch seals.

Belukhas are present along the coast from northern Kuskokwim Bay to the mouths of the Yukon in spring through autumn. The earliest reported sighting was on 20 May 1978 near Cape Romanzof and the latest at about freeze-up time in early to mid-November at Hooper Bay. Belukhas are often sighted and occasionally hunted by residents of Kipnuk, Toksook Bay, Tanunak, and Hooper Bay, where they are apparently more common in spring and autumn than in midsummer. They concentrate off the mouths of the Yukon River from May or June until about early October, feeding on salmon (Oncorhynchus spp.), herring (Clupea harengus), and saffron cod (Eleginus gracilis). The largest sighting was of over 100 animals feeding off the river mouth in July 1981.

Harbor Porpoise

A single sighting of "many" harbor porpoises was made off Quinhagak in July 1972.

Harbor porpoises have been reported off the south and east sides of Nunivak Island. Sixteen were seen feeding on capelin (Mallotus villosus) near Little Cape Corwin in June 1979. A few were present on the south side in July 1982.

We located only two confirmed sightings of harbor porpoises along the coast north of Kuskokwim Bay. One was on an unknown date at Hooper Bay, and the other was an animal caught in a salmon net in late May at Alakanuk. Harbor porpoises are probably present along most of this coastline.

Minke Whale

Minke whales were reported near Little Cape Corwin in June 1979, when they were observed feeding on capelin, and near Cape Mendenhall in October 1981.

Gray Whale

We located only three sightings of gray whales in Kuskokwim Bay. A single whale was seen chasing a school of herring north of Goodnews Bay in May 1978. Another gray whale was seen in July 1972 off Quinhagak. Five were seen swimming west about 36 km southwest of Kwigillingok in late May 1981.

Gray whales are commonly seen swimming in a northwesterly direction along the southern coast of Nunivak Island from Cape Mendenhall to Cape Mohican in May and June. Occasional sightings have been made on the north and east sides in June. These animals were also swimming north or northwest.

A single gray whale was sighted at Cape Vancouver on 17 May 1981. We have no other records of sightings along the mainland coast between Kuskokwim Bay and Norton Sound.

Gray whales have been seen and reported in June-August near St. Matthew Island.

D. Norton Basin (Figures 11-15; Tables 12-17)

Steller Sea Lion

Sea lions are uncommon in the Norton Sound region, where rocky headlands and islands (typical sea lion haulouts) are scarce. A single sea lion was reported from Cape Denbigh on 14 June 1981. Two subadult males were sighted in northern Norton Sound in early June 1981, one at Topkok Head and one east of Chiukak. Both were hauled out on the rocks.

Sea lions, probably males only, are present around St. Lawrence Island and the Punuk Islands in summer and autumn. About 200 were reported from the Punuks in late September 1953. In 1981, residents reported that sea lions still hauled out on the Punuks in autumn. However, none hauled out there from 28 September to 4 December 1981. On St. Lawrence Island, sea lions haul out during open-water months near Southwest Cape, Southeast Cape, and along the north-central coast east of Savoonga. There are no recent counts from any of these areas. In late September 1953, about 1,000 were hauled out at Southwest Cape.

Sea lions are irregular visitors to the Diomede Islands and Fairway Rock in late summer and early autumn.

Spotted Seal

Spotted seals are present along the inner Norton Sound coast from the time the ice breaks up in spring until freeze-up. They have been reported in association with herring schools near Stebbins (Stuart Island), St. Michael Island, St. Michael Bay, and Shaktoolik in May and June. The largest sighting was of about 500 seals hauled out on the ice near St. Michael Island during the herring run in early May 1981. Spotted seals are hunted in the autumn by residents of Stebbins. The seals were quite numerous in southern Norton Bay at freeze-up in early October 1981.

Spotted seals are present in the Golovnin Bay area from breakup in June until freeze-up in November but are most numerous and visible in late summer and autumn. They haul out near Cape Darby, Carolyn Island, and Rocky Point. The largest sightings were in late September 1981, when 100-150 seals were present near Rocky Point and about 200 were hauled out and in the water near Carolyn Island. From Rocky Point to the Sinuk River west of Nome, spotted seals are abundant during their spring and autumn migrations but are less common or at least less visible during summer. Most sightings are from mid-May to mid-June and mid-November to mid-December, when the seals are hunted by local residents.

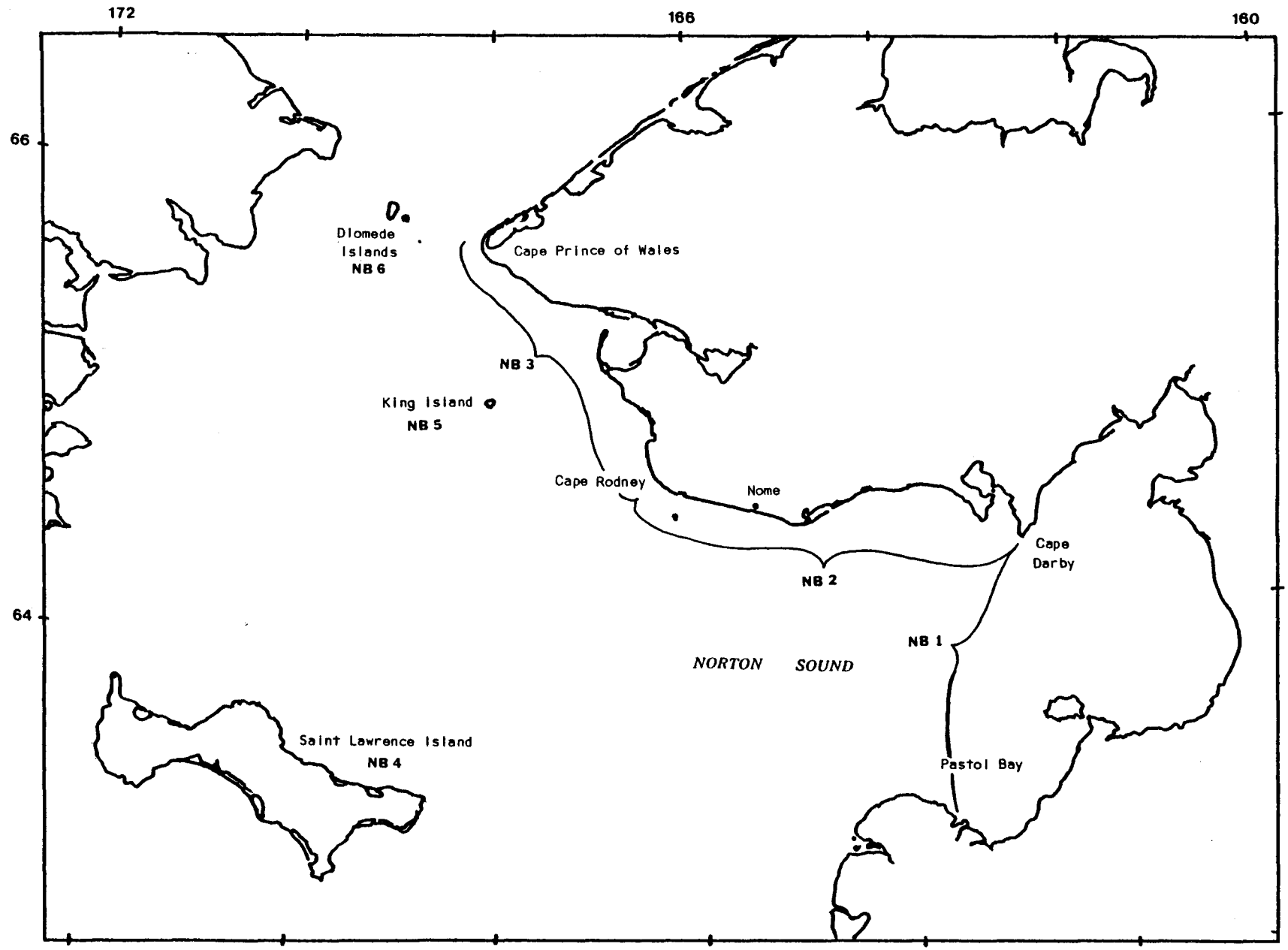

Figure 11. Map of the Norton Basin planning area showing subdivisions used in data compilation.

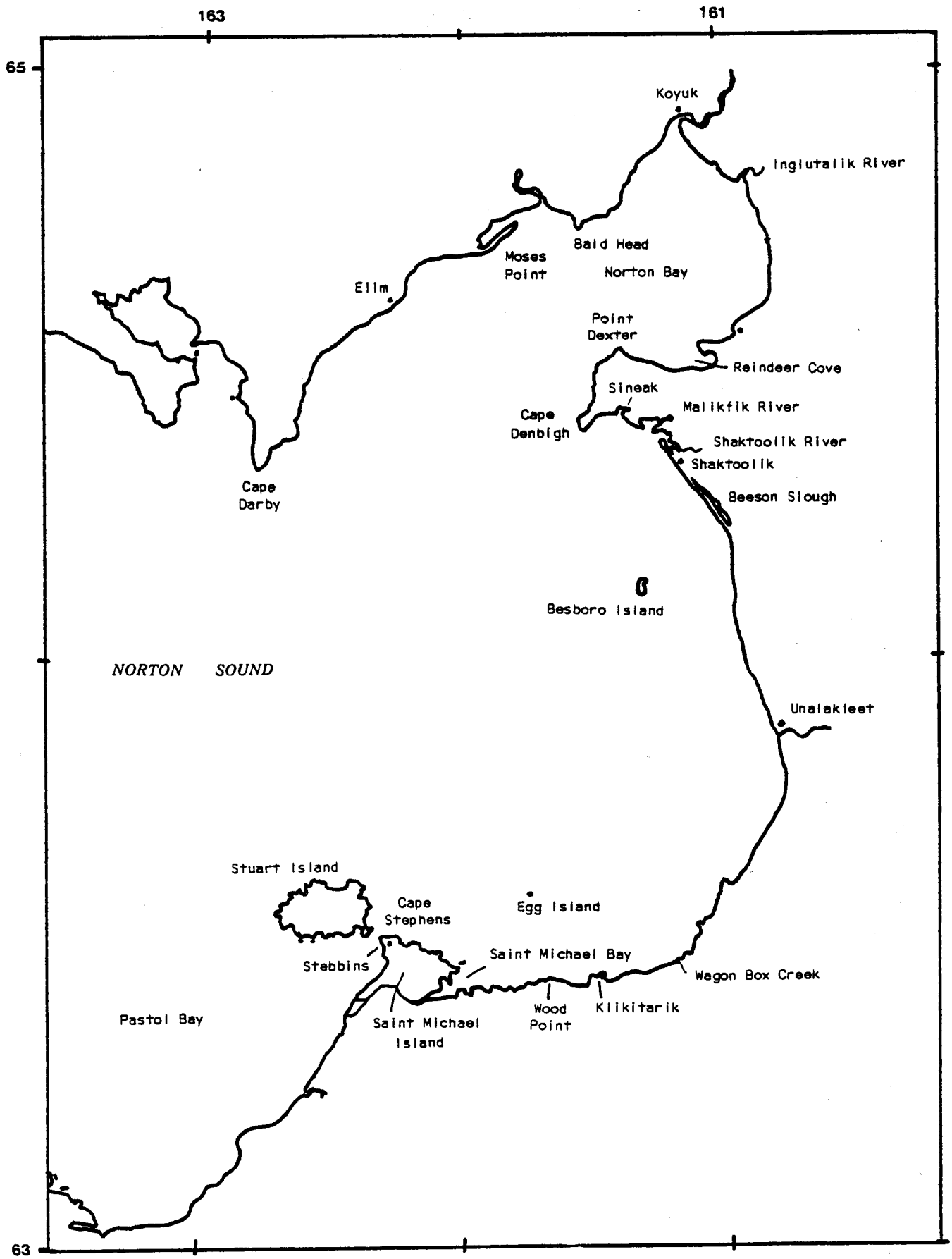

Figure 12. Map of the Norton Basin, region NB 1.

Table 12. Sightings of coastal marine mammals in the Norton Basin, region NB 1.

Location	Date	Number	Comments	Source
STELLER SEA LION				
Cape Denbigh	14 Jun 81	1	"reliable observer," aerial survey	ADF&G herring survey
SPOTTED SEAL				
Pastolik R. mouth to Egg Is.	late summer, autumn	present	hunted by villagers from Stebbins	Wolfe 1981
Stebbins/Stuart Is.	June	many	present during herring run	K. Frost, from residents
Stebbins	autumn	present	hunting occurs	"
St. Michael Is., Rock Pt. area	8 May 81	± 500	hauled out; also on ice and near herring; aerial survey for herring	L. Schwarz
St. Michael Bay	9 Jun 78	2	in water; aerial survey for herring	L. Barton
Besboro Is., N end	ice-free months	present	haul out on sand beach	Thomas 1982
Beeson Slough	autumn	present	hunted	"
Shaktoolik R. to Sineak R.	autumn	present	feeding on saffron cod	"
Shaktoolik	30 May 79	3	in water; aerial survey for herring	L. Barton
Point Dexter, E of	2 Oct 81	30 +	hauled out on ice; boat survey	K. Frost
Reindeer Cove	autumn	present	feeding on herring	Thomas 1982
Moses Point to Bald Head	summer, autumn	present	haul out on beaches when they vacate Besboro Is. due to arrival of walruses	"
WALRUS				
Egg Is.	Jun 71	200-300	hauled out	J. Burns
Besboro Is.	Jun-Jul 63	200-400	hauled out; hunted	"
	Jun-Jul 71	small number	hauled out	"
	7 Jul 64	none	aerial survey	ADF&G files, Nome
	Aug 61	200	hauled out, adult and subadult males	Burns 1965
	summers 80 and 81	100 +	hauled out	Thomas 1982

Table 12., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
St. Michael to Shaktoolik	2 Aug 62	20-25		J. Burns
Cape Denbigh	13 Jun 81	1	aerial survey	ADF&G herring survey
Norton Bay	spring 79	"large numbers, 1000 +"	not present every year	Thomas 1982
	spring 80	some		"
BELUKHA WHALE				
Norton Sound, western	17 May 81	34	aerial survey	Ljungblad et al. 1982
Norton Sound, central area	26 Jun 76	4	"	Harrison and Hall 1978
Pastolik R. mouth to Egg Is.	late summer, autumn	present	hunted by villagers from Stebbins	Wolfe 1981
Cape Stephens	17 May 81	5	near herring schools; aerial survey for herring	L. Schwarz
Stuart Is., W of	22 Jun 81	12	aerial survey	Ljungblad et al. 1982
Stuart Is., 20 mi N	23 Jun 81	40		R. Nelson
Stebbins	mid-Jun 79	present	7-8 taken	R. Tremaine
	summer 76	present	caught 1 in salmon net	K. Frost, from residents
	spring 79	present	hunted	J. Burns
	mid-Oct 80	present	2 taken	R. Nelson
	mid-Nov 79	some	hunted	"
	mid-Nov 79	present	several taken (2-10)	J. Burns
St. Michael, E of	30 May 79	2	aerial survey for herring	L. Barton
St. Michael	30 May 81	1	taken in fish net	G. Seaman
	spring-autumn	present	appear with earliest king salmon runs	J. Burns
	5-10 Jun	present	first of the year appear after ice goes out of inner bays; arrival coincides with herring spawning	Nelson 1887
	7 Jun 81	present	11 taken by hunters mid-April through the summer	G. Seaman

Table 12., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
St. Michael, cont.	9 Jun - 10 Nov	present		Lensink 1961
	midsummer-autumn	present	feeding on saffron cod	Nelson 1887
Wood Pt. (10 mi E St. Michael Bay)	30 May 79	1	aerial survey	ADF&G herring survey
Klikitarik (E St. Michael)	late Apr	present	eating herring	L. Schwarz, from residents
Wagon Box Creek (24 mi E St. Michael)	30 May 79	1	aerial survey	ADF&G herring survey
Unalakleet	21 Jun 81	5 or 6	offshore	R. Nelson
	spring-autumn	present	few in Jul, Aug	G. Seaman
Besboro Is. to Shaktoolik	Apr-Jun Sep-Oct	present	including Beeson Slough	Thomas 1982
Besboro Is.	10 Jun 79	6-8	feeding on herring	R. Nelson
	mid-Jun	present	"	local pilots
Shaktoolik	early Apr	present	appear as ice breaks up	G. Seaman
	late May - early Jun 82	present	hunted	J. Burns
	Sep-Oct	present	"	"
	ice-free months	present	hunted only in spring and autumn; may remain until November	Thomas 1982
Shaktoolik to Cape Denbigh	ice-free months	present	hunted by Shaktoolik villagers	"
Cape Denbigh to Pt. Dexter, Reindeer Cove	ice-free months	present	hunted spring and autumn	"
Cape Denbigh	Apr	present	appear as ice breaks up	G. Seaman, from residents
	2 Jun 81	12-18	aerial survey	ADF&G herring survey
Cape Denbigh, N of	21 Jul 77	2	"	"
Pt. Dexter, SW of	28 May 81	94 counted	eating herring; aerial survey for herring	L. Schwarz
	21 Jul 77	2	aerial survey for herring	L. Barton

Table 12., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
Norton Bay	Apr-Jun Sep-Oct	present	hunted by Shaktoolik residents who say more whales are here than near Cape Denbigh	Thomas 1982
Norton Bay between Bald Head and Pt. Dexter	2 summers in 1970's	50-75	nearshore	W. Drury
Norton Bay	approx. 10 Jul 79	some	hunted; at least 3 taken	R. Nelson, from Koyuk resident
Inglutalik River mouth	spring-autumn	present	important belukha hunting area	Ray 1964, 1975
Koyuk	May-Sep	present		G. Seaman, from residents
	Jun-early Oct	present	traditionally important hunting area; hunted Jun-Jul and Sep-Oct	J. Burns, from residents
	approx. 10 Aug 79	present	2 taken in Norton Bay	J. Burns
Elim	early Jun 77	present	3 taken	K. Frost
	Jun-Oct	present	traditionally important hunting area; hunted Jun-Jul and Sep-Oct	J. Burns, from residents
HARBOR PORPOISE				
Unalakleet	17 Jun 81	1	caught in salmon net, female	R. Nelson

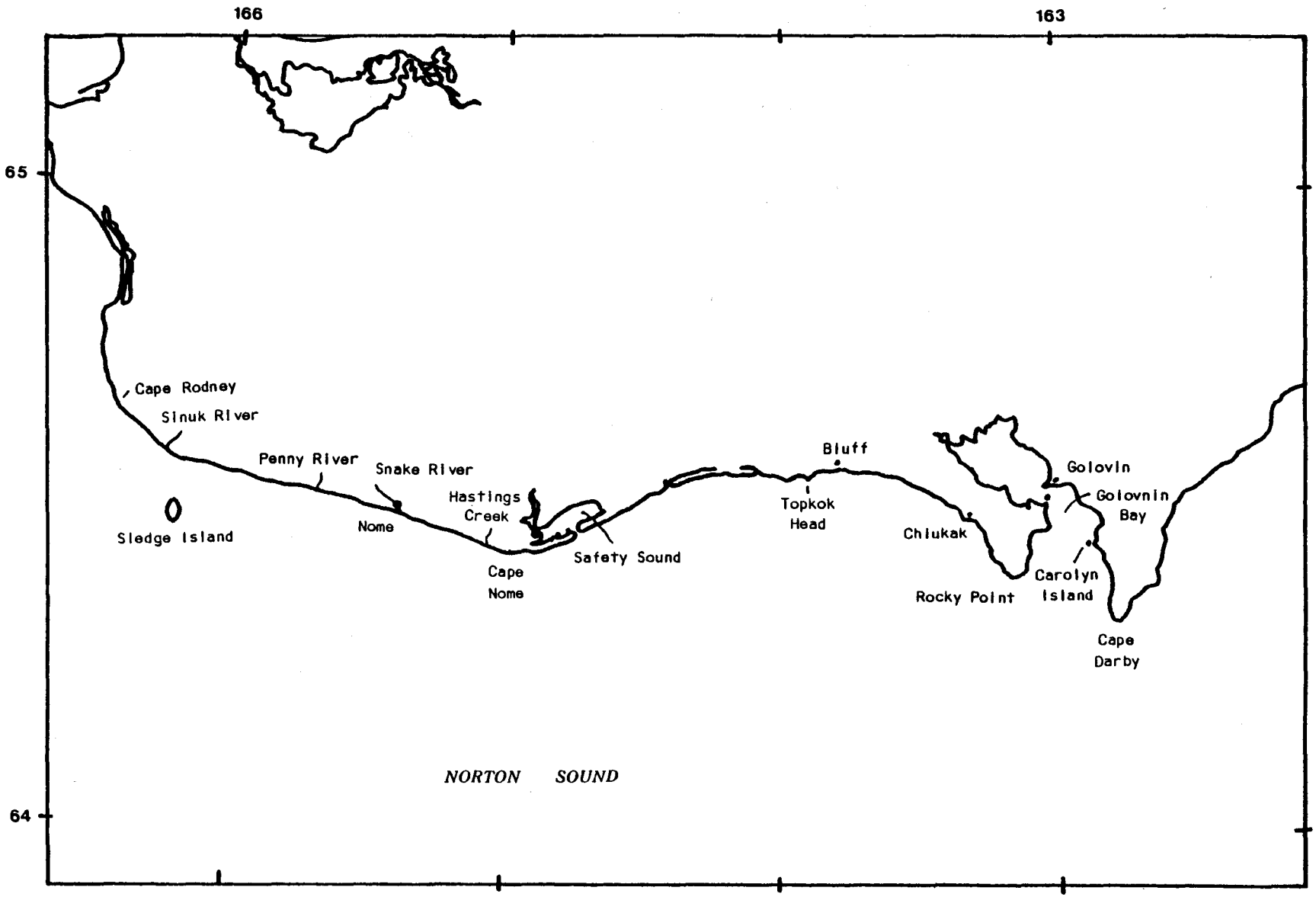

Figure 13. Map of the Norton Basin, region NB 2.

Table 13. Sightings of coastal marine mammals in the Norton Basin, region NB 2.

Location	Date	Number	Comments	Location
STELLER SEA LION				
Chiukak, E of	3 Jun 81	1	male, 1-2 years old, hauled out on rock	L. Lowry
	6 Jun 81	1	same animal as 3 Jun, hauled out on rock	"
Topkok Head	3 Jun 81	1	male about 2 years old, hauled out on rock	"
Sledge Is.	Jul-Sep	present	Nome residents report irregular sightings	J. Burns
SPOTTED SEAL				
Golovnin area, Cape Darby	6 Jul 81	2	aerial survey	Ljungblad et al. 1982
Golovnin area, Rocky Pt., SW of	13 Jun 78	1	in water; aerial survey for herring	L. Barton
Golovnin area, Rocky Pt.	12 Jul 81	100 +	hauled out; also along coast from W of Rocky Pt. to E of Cape Darby and in Golovnin Bay	R. Nelson
Golovnin area, Rocky Pt., W of	14-18 Aug 81	± 20		L. Lowry
Golovnin area, Carolyn Is.	14-18 Aug 81	15-20		"
Golovnin area, Rocky Pt.	24-25 Sep 81	100-150	most in water near and NE of point; few hauled out on rocks at point and W	"
	30 Sep 81	100 +	most in water feeding on saffron cod; boat survey	J. Burns/K. Frost
Golovnin area, Carolyn Is.	1 Oct 81	200 +	hauled out and in water; boat survey	"
Golovnin Bay, central	30 Sep - 1 Oct 81	100 +	in water; boat survey	"
	1, 2 Oct 66	9	hauled out; small, young animals	R. Baxter
Golovnin area, Rocky Pt., NW side	3 Oct 76	20-30	hauled out and in water; no seals east of point or by Cape Darby; boat survey	K. Frost
	5 Oct 76	± 15	in water; boat survey	"
Golovin	11 Oct - 2 Nov 72	present	hunted	J. Burns

Table 13., continued

Location	Date	Number	Comments	Source
SPOTTED SEAL. cont.				
Golovnin area, Rocky Pt.	29 Oct 81	18	hauled out on rocks at point and NE; aerial observations	R. Nelson
	1 Nov 66	present	hunted	J. Burns
	16 Nov 81	2	diving	R. Nelson
Topkok Head	occasional	present	not used on regular basis	J. Burns
Safety Sound	27 May 78	5	in water; aerial survey for herring	L. Barton
	summer-autumn	present	used sound before road was open; use now especially when road closed; most use in autumn	J. Burns
Cape Nome	30 May 78	2	in water	"
Cape Nome and Hastings	29 Nov 65	"numerous"	not evenly distributed; pass through about same time each year	"
Nome	mid-May - mid-Jun 67	present	hunted	"
	Nov, Dec 1963-1974	present	"	"
Sledge Island	summer-autumn	present max. 25-35 in early Nov	intermittent over many years; haul out here when not disturbed by hunters; on spit at N end (low, flat sand point)	"
	Jun 68	present	hunted	"
Sinuk River	summer-autumn	present	present during pink salmon runs; no observations of haulout; they frequent river mouth and small estuary inside the bar	"
WALRUS				
Golovnin area, Cape Darby	2 Jun 81	50	hauled out on rocks, hunted	D. Amatoolik
	4 Jun 81	1	hauled out	L. Lowry
Golovnin area, Cape Darby, E side	5 Jun 81	1	swimming; young male	"

Table 13., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Golovnin area, Cape Darby	22 Jun 79	7	hauled out	R. Nelson
Chiukak, E of	6 Jun 81	1	adult male; hauled out, then shot	L. Lowry
Cape Nome	13 Jun 78	1	in water; aerial survey for herring	L. Barton
Nome	14 Oct 75	1 adult male	in water outside jetty	J. Burns
Sledge Is., N side	16 Jul 71	950 - 1,050	hauled out; all males	"
	summer 76	some	hauled out	USFWS/SBCS Rep., W. Drury
	Jun-Aug 80, 81	2-3	hauled out all summer; bulls	R. Nelson
BELUKHA WHALE				
Golovnin area, Cape Darby	29 Apr 79	present		Ljungblad et al. 1981
Golovnin area, Carolyn Is., near	30 May 78	4	aerial survey	ADF&G herring survey
Golovnin area, Rocky Pt.	30 May 78	5	"	"
Golovnin area, Rocky Pt., NW of	30 May 78	9	aerial survey for herring	L. Barton
Golovnin area, Rocky Pt., S of	17 Jun 77	1	aerial survey	ADF&G herring survey
Golovnin area, Rocky Pt.	30 Sep 81	70	feeding on saffron cod; boat survey	K. Frost
Golovnin area, Rocky Pt., 3 mi off	1 Oct 81	25-55	all sizes present from small gray to large white; boat survey	"
Cape Darby, N, mouth of Golovnin Bay	3 Oct 76	25-30	calves with group; boat survey	"
Golovnin Bay	spring-autumn	present	important hunting area	Ray 1964, 1975
	spring-autumn	present	historically common	Golovin residents
	late May-Jun	present	following herring schools	Giddings 1964, 1977
Bluff, S of	17 Jun 77	1	aerial survey	ADF&G herring survey
Topkok Head to Bluff	5 Sep 81	± 150	approx. 1/2 mi offshore, feeding; pods of 4-9 animals	R. Nelson

Table 13., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE, cont.				
Cape Nome	Ice-free period	present	most common early summer, autumn	Ray 1964
Cape Nome, W of	21 Apr 81	present	aerial survey	Ljungblad et al. 1982
Cape Nome, SE of	Jun 76	5		W. Drury
Cape Nome	9 Jul 62	2	caught in fish nets	J. Burns
	Nov 77	150-200	moving by	ADF&G files
	19 Nov 80	10	active feeding	R. Nelson
	19 Nov 80	75	feeding	"
	29 Nov 79	± 250	2 pods, came from W, milled near cape, then headed S	H. Wilkalkia
Nome	5-6 May 79	present	seen in ice	R. Tremaine
	6 May 79	present	between Nome and Sledge Is.	J. Burns
	11 May 81	1	killed by hunter	R. Nelson
	approx. 14 May 79	present	1 taken	R. Tremaine
	10 Jun 79	4	no gray animals	R. Nelson
Nome, W of Snake R. mouth	7 Jun 82	30	feeding, then moved eastward; approx. 50% younger animals	"
Nome, W of	21 Jul 77	1 adult, 1 juvenile	moving W, aerial survey for herring	L. Barton
HARBOR PORPOISE				
Nome, 26 mi E of	8 Jun 81	1 female	caught in salmon net	R. Nelson
Nome, E of Fort Davis	22 Jul 71	1	"	J. Burns
Nome	26 Sep 81	3	swimming; ship observation	L. Lowry
Penny River	23 Aug 82	1	caught in salmon gillnet; male	R. Nelson

Table 13., continued

Location	Date	Number	Comments	Source
MINKE WHALE				
Golovnin Bay, mouth of	5 Jun 81	2	feeding; capelin visible in water	L. Lowry
Golovnin area, Cape Darby	6 Jun 81	1		"
Golovnin Bay, mouth of	6 Jun 81	1		"
	6 Jun 81	1		"
Golovnin area, Rocky Pt.	1 Oct 81	1	swimming out of Golovnin Bay; boat survey	J. Burns
GRAY WHALE				
Nome, SE of	May 80	6	within 1 km of beach	Ljungblad et al. 1981
Nome area	18 May 80	15	offshore for several hours	USFWS Walrus Harvest rep.
	19-20 Jun 78	± 12	nearshore	H. Melchior
Cape Nome	4 Jul 62	1	caught in fish net	J. Burns
	9 Jul 81	1	swimming W	R. Nelson
Nome	14 Oct 75	1 ("huge")	remained in area for approx. 1 hour, 20 yards offshore	J. Burns
Nome, W, midway to Sledge Is.	24 Jun 81	4		R. Nelson

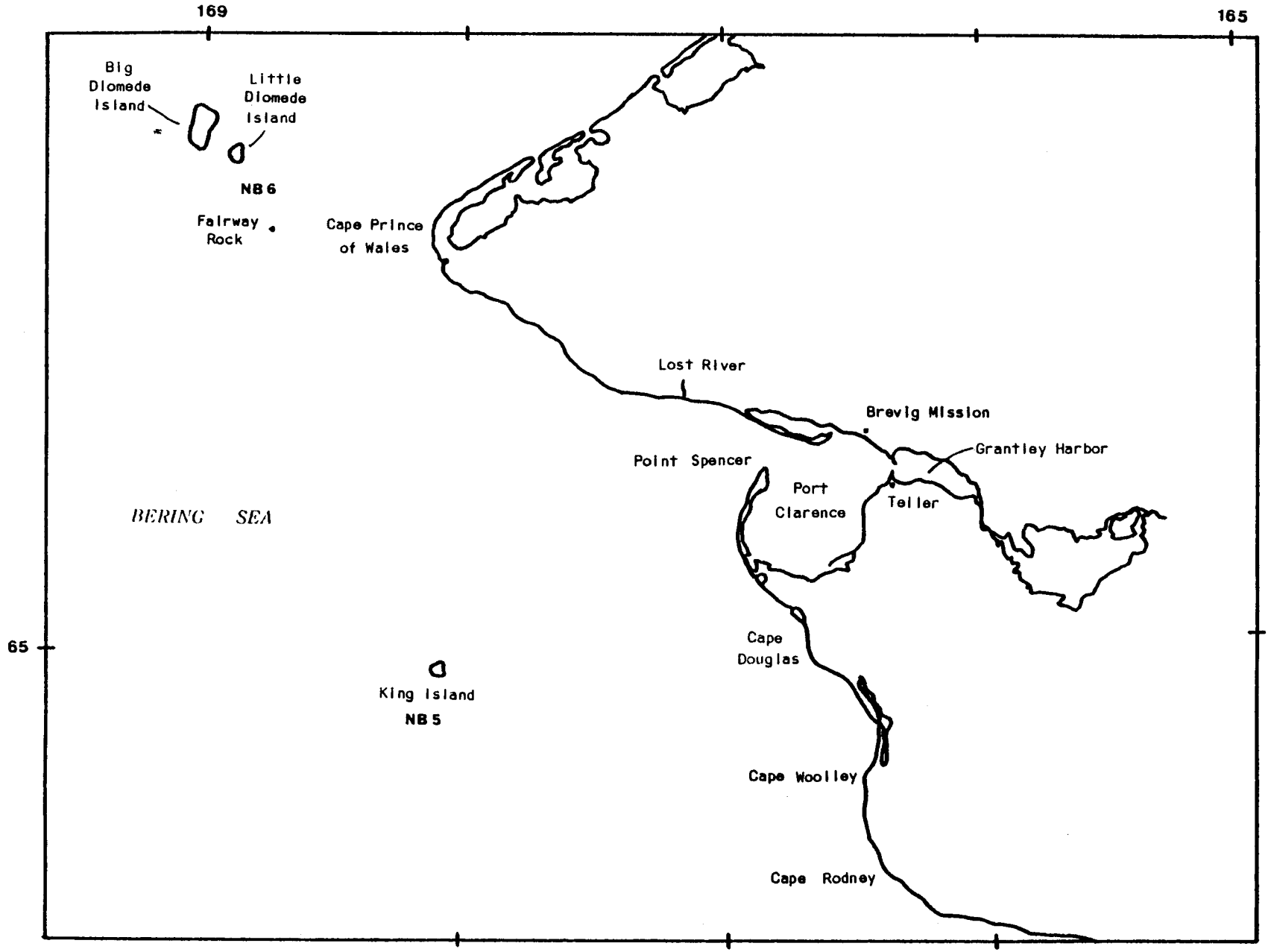

Figure 14. Map of the Norton Basin, regions NB 3, 5, and 6.

Table 14. Sightings of coastal marine mammals in the Norton Basin, region NB 3.

Location	Date	Number	Comments	Source
SPOTTED SEAL				
Cape Rodney	early Nov 66	present	hunted	J. Burns
Cape Woolley area	8-9 Jun 63	7 killed		ADF&G files, Nome
	14 Aug 72	present	hunted	J. Burns
	autumn	numerous	numerous every autumn, mainly on ocean side	"
Cape Woolley, west entrance	16, 17 Sep 67	90	W side of inlet, many subadults; hunted	"
Cape Woolley, east entrance	16-18 Sep 67	up to 150	hauled out inside entrance; probably ± 200 more in water within 1/2 mi of beach on ocean side	"
Cape Woolley area	20 Sep 71	present	hunted	"
	5 Oct 66	numerous	at mouth of Feather R.	"
	5 Nov 68	present	hunted	"
	mid-Nov 69	present	at mouth of Feather R. and at cape; hunted	"
Cape Woolley	18, 19 Nov 70	present	hunted	"
Cape Douglas	20 Jun (no year)	large concentration		ADF&G files, Nome
Port Clarence	all summer; autumn until freeze-up	present	sometimes penetrate into Imuruk Basin; most obvious in largest numbers at breakup in May-Jun (on rotten ice) and hauled out on mud flats, mainly S side from Sep to freeze-up; taken by hunters of Teller and Brevig Mission	J. Burns
	23 Aug 69	present	first of summer	W. Foster
	29 Aug - 25 Sep 69	present	hunted	J. Burns
Pt. Spencer to Teller	22 Sep 81	4	only seals seen	L. Lowry
	19 Oct 66	many	all sizes	J. Burns
Teller	Sep-Nov 1966-1972	present	hunted	"
Brevig Mission	Oct-Dec 72	present	"	"
Grantley Harbor	31 Aug 69	present	"	"

Table 14., continued

Location	Date	Number	Comments	Source
BELUKHA WHALE				
Lost River, S of	21 Jul 76	1	aerial survey	ADF&G herring survey
Port Clarence	Jun-Jul	present	appeared with schools of spawning herring	Ray 1964, 1975
	Jun-Jul	small numbers	occasional	G. Seaman, from residents
Grantley Harbor	Jun-Jul	historically common	appeared with schools of spawning herring and salmon runs	Ray 1964, 1975
	Jun-Jul	small numbers	occasional	G. Seaman, from residents
HARBOR PORPOISE				
Cape Woolley	Aug-Oct	present	reported as occasional late summer-autumn visitors	E. Muktoyuk
	6 Oct 66	2		J. Burns
	14 Oct 76	3	perhaps feeding; swimming slowly S	L. Lowry
GRAY WHALE				
Cape Douglas	15 Jun 81	3	2 more than 50 ft long; aerial survey	ADF&G herring survey
Cape Prince of Wales, 5 mi S of	15 Jun 81	2	aerial survey	"
Cape Prince of Wales	1 Jul 77	30-50	appeared to be feeding	K. Frost

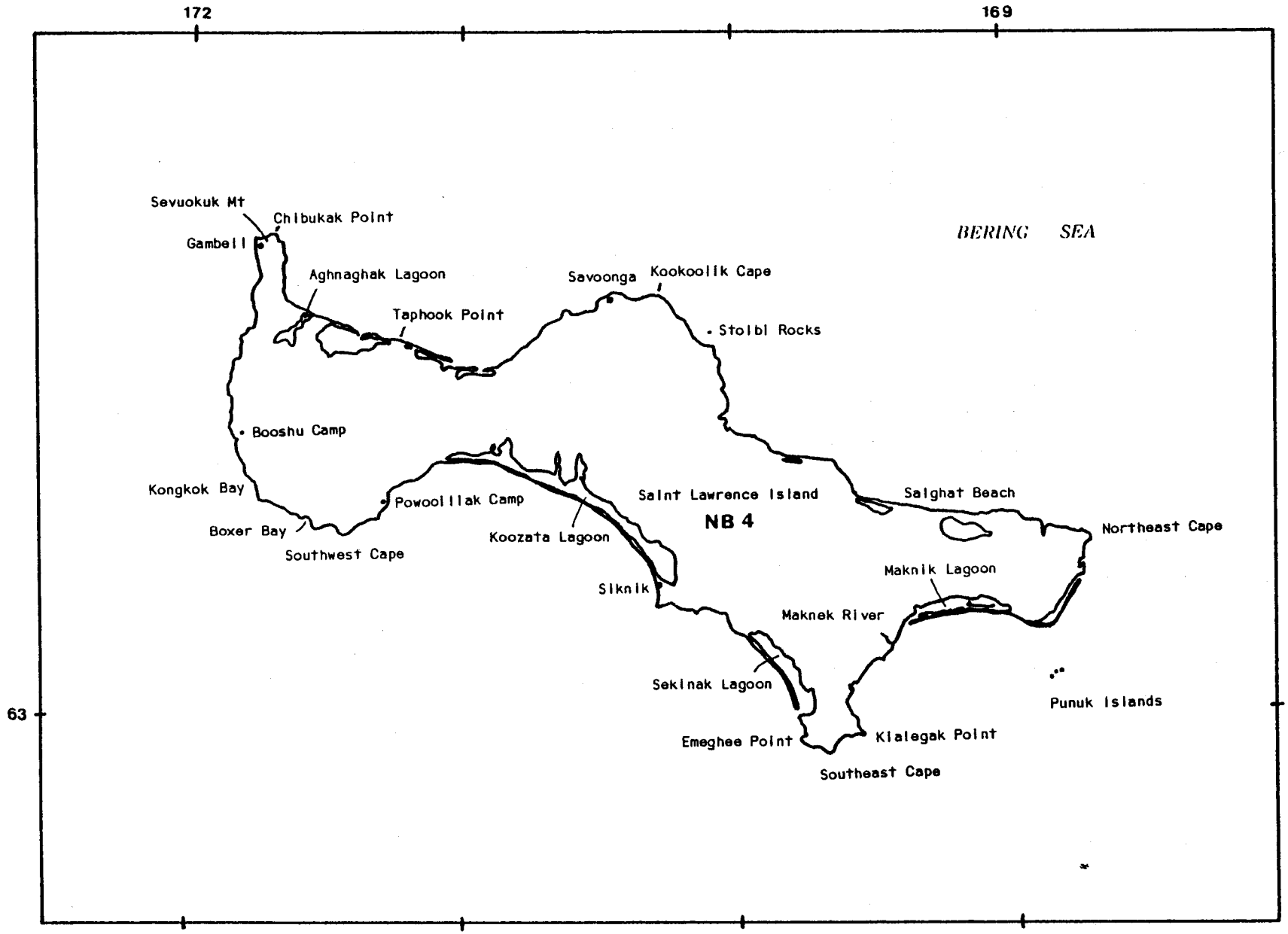

Figure 15. Map of the Norton Basin, region NB 4.

Table 15. Sightings of coastal marine mammals around St. Lawrence Island and the Punuk Islands in the Norton Basin, region NB 4.

Location	Date	Number	Comments	Source
STELLER SEA LION				
Punuk Islands	29 Jun 79	2	immatures, hauled out on rocky SE shore of South Island; shore observation	B. Kelly
	autumn	present	haulout	R. Stephenson, from residents
Punuk Islands, southernmost island	28-29 Sep 53	200	hauled out, molting; presumed to be all males	Kenyon and Rice 1961
Punuk Islands	28 Sep - 4 Dec 81	none		B. Kelly
	1 Nov 64	1	hauled out; usually leave by late August	J. Burns
St. Lawrence Is.	Feb-Mar 60	none	aerial survey	Kenyon and Rice 1961
St. Lawrence Is., E and W of Southwest Cape	open-water months	present	haulout	R. Stephenson, from residents
St. Lawrence Is., Southwest Cape	summer	present	haulout	B. Kelly, from residents
St. Lawrence Is., Stolbi Rocks	summer	present	haulout	R. Stephenson, from residents
St. Lawrence Is., Southwest Cape, rocks offshore and south Punuk	late Jun - Nov 53-59	variable numbers	regular visitors; individuals and groups of 5 or 6; greatest number arrive in Sep, depart in Nov when ice comes	Kenyon and Rice 1961
St. Lawerence Is., Kookoolik Cape	July	present	haulout	R. Stephenson, from residents
St. Lawrence Is., Southwest Cape	25 Sep 53	± 1,000	hauled out on offshore rocks and beach; molting; presumed to be all males	Kenyon and Rice 1961
SPOTTED SEAL				
St. Lawrence Is., Gambell	Feb - Jun; Oct - Nov	numerous	hunted in water or on ice; migrating	J. Burns
St. Lawrence Is., Savoonga	Apr - Jun; Oct - Nov	present	"	"
St. Lawrence Is., Northeast Cape	ice-free months	present		R. Stephenson, from residents
St. Lawrence Is., Boxer Bay	ice-free months	present	occasionally abundant	J. Burns

Table 15., continued

Location	Date	Number	Comments	Source
SPOTTED SEAL, cont.				
St. Lawrence Is., Koozata Lagoon	ice-free months	present	occasionally abundant	J. Burns
St. Lawrence Is., S side	ice-free months	present	haul out on rocks and bars along entire S side	"
St. Lawrence Is., Siknik Cape, S of point on tiny island	ice-free months	"100's"	1 of 3 major haulouts	F. Fay
St. Lawrence Is., Southeast Cape to Kialegak Pt.	ice-free months	"100's"	on rocks; 1 of 3 major haulouts	"
St. Lawrence Is., Southeast Cape to N of Kialegak Pt. (also W to Emeghee Pt.)	summer	present		R. Stephenson, from residents
St. Lawrence Is., Sekinak Lagoon, rocks and shoals S of	ice-free months	"100's"	1 of 3 major haulouts	F. Fay
St. Lawrence Is., Sevuokuk Mt. to abouf Aghnaghak Lagoon	autumn	present	few in summer	R. Stephenson, from residents
St. Lawrence Is., Southwest Cape E to Powooiliak Camp, W to Booshu Camp	ice-free months	present		"
WALRUS				
Punuk Islands	1930's		"some, all summer; but not every year	L. Kulukhon
	30 Mar 79	0	no live marine mammals; surrounded by ice; shore observation	B. Kelly
	24-26 Jun 79	0	walrus carcasses only; shore observation	"
	27 Jun 79	7	adult males; hauled out on NW spit; shore observation	"
	28-30 Jun 79	0	no live marine mammals; shore observation	"
	11 Jul 82	0	"	"
	29 Sep 81	0	"	"
	30 Sep 81	10-49	males	"
	Oct 62	1,500		Burns 1965

Table 15., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
Punuk Islands, cont.	24 Oct 65	60 on beach 100 in water	already on islands by late September	ADF&G files, Nome
	Oct-Nov 59	"hundreds"		V. Slwooko
	Oct-Nov 63	20-25		Burns 1965
	Oct-Nov 78	"thousands"		G. Pelowook
	Oct-Nov 78	50-60,000	32,000 North Is.; 14,000 Middle Is; 11,000 South Is.	Fay and Kelly 1980
	Nov 60	"hundreds"		V. Slwooko
Punuk Islands, E tip of large island	4 Nov 63	1 male 1 female	hauled out; circumnavigated islands, only walrus seen	J. Burns
Punuk Islands	16 Nov 81	± 15,000	both males and females; shore observation	B. Kelly
	29 Nov - 4 Dec 81	0	no live walruses; shore observation	"
	6 Dec 66	many		G. Toolie
St. Lawrence Is.	autumn 1979-1981	present	only the Chibukak Pt. haulout used	F. Fay
St. Lawrence Is., Chibukak Pt.	autumn	present	occurred irregularly for past 17 yrs	Fay and Kelly 1980
	Oct 56	5		V. Slwooko
St. Lawrence Is., Kialegak Pt.	Oct 78	"thousands"		T. Gologergan, Jr.
St. Lawrence Is., Northeast Cape	25 Oct 74	present	2 males taken; first walrus of season taken	ADF&G files, Nome
St. Lawrence Is., Salghat	Oct-Nov 78	± 19,000	hauled out	Fay and Kelly 1980
St. Lawrence Is., Maknik	Oct-Nov 78	± 35,000	"	"
St. Lawrence Is., Kialegak Pt.	Oct-Nov 78	± 37,000	"	"
St. Lawrence Is., Chibukak Pt.	Nov 62	"hundreds"	stayed 2-3 weeks first year, annually thereafter	V. Slwooko
St. Lawrence Is., Southeast Cape	4 Nov 63	3		J. Burns
St. Lawrence Is., Chibukak Pt.	Nov-Dec 78	"hundreds"		T. Antoghame

Table 15., continued

Location	Date	Number	Comments	Source
WALRUS, cont.				
St. Lawrence Is., Chibukak Pt., cont.	Dec 70	"many"		V. Slwooko
St. Lawrence Is., Kialegak Pt.	Dec 70	"some"	"for first time"	"
BELUKHA WHALE				
St. Lawrence Is., N of Gambell	2 Jan 58	many	swimming along N beach, herd about 1 mi long	F. Fay
St. Lawrence Is., beach N of Gambell	24 Jan 56	present		F. Fay, from residents
St. Lawrence Is., ± 20 mi N of Savoonga	9 Apr 53	10-12		F. Fay
St. Lawrence Is., 5-25 mi N of Gambell	9 Apr 80	30 +		R. Nelson
St. Lawrence Is., Gambell	late Apr 60	many		F. Fay, from resident
St. Lawrence Is., near Taphook Pt.	30 Jun 56	1	calf, close inshore	F. Fay
St. Lawrence Is., Siknik	24 Aug 56	1	lone calf	V. Slwooko
St. Lawrence Is., near Savoonga	Nov	present	occasionally seen	J. Burns, from residents
St. Lawrence Is., off of Gambell and N coast	late Nov, early Dec 57	at least 1,000		Lensink 1961
St. Lawrence Is., S side	winter	present	usually stay around S side all winter (reported in 1954)	V. Slwooko
HARBOR PORPOISE				
St. Lawrence Is., Stolbi Rocks	unknown, 50's or 60's	2		F. Fay
St. Lawrence Is., Koozata Lagoon	unknown	1	stranded	"
MINKE WHALE				
St. Lawrence Is.	summer	"some"		R. Stephenson, from residents

Table 15., continued

Location	Date	Number	Comments	Source
MINKE WHALE, cont.				
St. Lawrence Is., Gambell	17 Aug 78	1		J. Burns
GRAY WHALE				
St. Lawrence Is., W of	May-Jul 52-54	present	traveling and feeding close to shore	Pike 1962
St. Lawrence Is., E and W ends, Southeast Cape, N of Gambell	May-Oct 75-80	present	aerial and vessel surveys	Nerini et al. 1980
St. Lawrence Is., N of	May-Aug 81	present	aerial survey	Ljungblad et al. 1982
St. Lawrence Is., S and SE of	May-Aug 81	few	"	"
St. Lawrence Is., Gambell	11-21 May 50-61	present	"first" dates of arrival	Pike 1962
St. Lawrence Is., SW of	12 May 70	5		J. Burns
St. Lawrence Is., Gambell	14 May 80	1	aerial survey	USFWS Walrus Harvest Rep.
St. Lawrence Is., Kongkok Bay	19 May - 3 Sep 76	present	"in bay all summer"	USFWS/SBCS Rep., G. Searing
St. Lawrence Is.	summer	present	all around island	R. Stephenson, from residents
St. Lawrence Is., SE and W ends	Jun 76	present	aerial survey	Braham et al. 1977a
St. Lawrence Is., N of Gambell	Jun-Oct 76	present	"	Harrison 1979
St. Lawrence Is., W of	Jul 57, Aug 55	present		Ichihara 1958
St. Lawrence Is., E of	Jul-Aug 58, 59	present		Pike 1962
St. Lawrence Is., N of Gambell	17 Aug 78	40-50		J. Burns
St. Lawrence Is., N of	autumn 80	present	aerial survey	Ljungblad et al. 1981
St. Lawrence Is., NE of, 1/2 way between island and mainland	1 Oct 76	65-100	apparently feeding	K. Frost

Table 16. Sightings of coastal marine mammals on King Island in the Norton Basin, region NB 5.

Location	Date	Number	Comments	Source
WALRUS				
King Island	Jun-Sep 80	± 5,000	hauled out; mostly bulls	E. Muktoyuk/ R. Nelson
	Jun-Sep 81	± 1,000	hauled out; apparently all bulls	R. Nelson
	5 Jun 81	± 1,000	hauled out on rocks on SE portion of island; reported by U.S. Coast Guard personnel from Kodiak	L. Lowry
	Jul 82	± 800	hauled out; mostly bulls	J. Koozuna
	19 Jul 79	± 1,000	hauled out on rocks at NW side of island; walrus hunting at King Is. since 1 July	R. Nelson

Table 17. Sightings of coastal marine mammals around the Diomede Islands in the Norton Basin, region NB 6.

Location	Date	Number	Comments	Source
STELLER SEA LION				
Diomede Islands	Feb-Mar 60	none	aerial survey	Kenyon and Rice 1961
Little Diomede Is., S end	late summer-early autumn	few	irregular visitors, leave as soon as ice comes	"
Fairway Rock	late summer-early autumn	few	"	"
WALRUS				
Big Diomede Is.	Oct 34	"hundreds"		T. Anayah
	Nov 39	3-500		N. Whitaker
	Nov-Dec 68	2-3,000		J. Burns
	Sep 71	"many"		"
	Oct 71	"hundreds"		"
	Nov 71	± 4,000		"
	late 70's - early 80's	5-10,000	haul out regularly from Jun to Dec	"
Little Diomede Is.	summer 74	large numbers	hauled out on rocks of island	"
	summer 80	large numbers	moving between Big and Little Diomedes; repeated efforts to haul out on Little Diomede	"
BELUKHA WHALE				
Diomede Islands, S of	Mar 61	several hundreds	in leads	Lensink 1961
Diomede Islands, N of	early Apr	present		"
Bering Strait	11 Apr 81	present	aerial survey	Ljungblad et al. 1982
Little Diomede Is.	20 Apr 81	1 taken, 2 struck and lost	"	USFWS Walrus Harvest Reps.
between Big and Little Diomede islands	13 May 79	5-10		D. Strickland

Table 17., continued

Location	Date	Number	Comments	Source
GRAY WHALE				
Diomede	3 Jun 72	2	first of season	J. Burns*
Little Diomede, N of	11 Jun 81	1	aerial survey	Ljungblad et al. 1982

Spotted seals are present along the coast north of Nome from May/June until December but are most concentrated and appear to be most abundant in September through November. Largest concentrations occur near Cape Woolley and Woolley Lagoon, and in Port Clarence and Grantley Harbor, where they are hunted by Eskimos from Nome/King Island, Teller, and Brevig Mission. They are also seen near Cape Rodney and Cape Douglas.

Spotted seals are regularly present around St. Lawrence Island from late spring to early winter. In years of light ice conditions, when the southern margin of pack ice is quite far north, spotted seals occur around St. Lawrence Island at least through February. They haul out on the island during ice-free months. They are particularly abundant in and near the lagoons on the south side of the island. There are at least three major haulouts where "hundreds" of seals may be present: a small island south of Siknik Cape, from Southeast Cape to Kialegak Point, and on the rocks and shoals south of Sekinak Lagoon. Spotted seals are also found along the coast east and south of Gambell and around the southwestern end of the island. Spotted seals are not known to haul out on the Punuk Islands. They are occasionally present around Little Diomede Island and Fairway Rock in late summer and early autumn and leave when the ice arrives.

Walrus

Walruses do not commonly haul out in inner Norton Sound, although they were occasionally seen there in summer 1961-1971. The largest recorded sightings were of 200 adult and subadult males on Besboro Island in August 1971 and 200-300 on Egg Island in June 1971. A small number was also seen on Besboro in June-July 1971 and during the summers of 1980 and 1981. Other sightings have occurred between St. Michael and Shaktoolik in August and at Cape Denbigh in June.

We know of four reports of walruses at Cape Darby: three sightings in early June and one in late June. Use of the Golovnin Bay area by walruses during the open-water season is probably only occasional. Walruses are abundant in the Nome area in spring before the ice leaves but are uncommon there during the open-water season. Single animals have been sighted hauled out east of Chiukak in June and in the water outside the Nome jetty in October.

The walrus population has been increasing greatly during the last 30 years, and with it the number of animals hauling out on St. Lawrence Island and the Punuks. Most use of coastal haulouts is from October to December. In the late 1950's and and early 1960's, "hundreds" were reported to haul out on the Punuks in October-November. In October-November 1978, that number had risen to 50-60,000, with the most animals present on the north Punuk island. On St. Lawrence Island, Chibukak Point east of Gambell was the only major haulout area in the 1960's and was used by "hundreds" of walruses. In autumn 1978, four other

haulout areas were used in addition to Chibukak: Kialegak Point, Maknik, Salghat, and an area southwest of Savoonga. Over 90,000 may have been hauled out at Salghat, Maknik, and Kialegak combined. Since 1978, only the haulouts at Chibukak and the Punuks have been used.

Since about 1979, walruses have hauled out on King Island in fairly large numbers. In each of the last three summers, walruses have used the island from June or July until early September. In July-August 1980, an estimated 5,000 to 6,000 walruses, including some females and calves, utilized the rocky beaches of this small island.

An estimated 5,000 to 10,000 walruses regularly haul out during the ice-free months on Big Diomede Island, where they are not disturbed by hunters. Walruses hauling out on Little Diomede Island are usually disturbed by the local residents and do not remain long. However, walruses continuously attempted to haul out on Little Diomede during June-September 1980.

Belukha Whale

Belukhas are common in this region from spring through autumn. They are first seen nearshore in May and early June and in some years as early as April. Their arrival coincides with the breakup of ice and the arrival of spawning herring and salmon. Although belukhas are present in inner Norton Sound throughout the summer, they are most commonly seen and hunted in June and September/October. They have been sighted near Stebbins, St. Michael, Klikitarik, Unalakleet, Besboro Island, Shaktoolik, Cape Denbigh, Point Dexter, throughout Norton Bay, Koyuk, and Elim. The largest reported single sighting was of about 100 whales feeding on herring southwest of Point Dexter in late May 1981.

Belukha whales are common in Golovnin Bay from spring through autumn. Historically, this was one of the important belukha hunting areas in Norton Sound. The whales first arrive in late May and June, following schools of herring, and are present until at least October. The largest documented sighting was of 70 animals feeding on saffron cod near Rocky Point on 30 September 1981. Both adults and gray sub-adults were present. Belukhas are seen all along the coast from Rocky Point to the Sinuk River from April through November but are most common in early summer and autumn.

Belukhas are occasionally sighted along the coast from the Sinuk River to Cape Prince of Wales. One was seen south of the Lost River in July. Historically, they were common in Port Clarence and Grantley Harbor, where their appearance coincided with the arrival of herring. Residents report they are now seen only occasionally and in small numbers.

Belukhas are rarely seen around St. Lawrence Island in summer. Occasional whales are seen in October, but most move down from the

north in November and December. Local residents report that they are seen more often in autumn at Gambell than at Savoonga. Belukhas are common around St. Lawrence Island in winter and spring.

Belukhas move by the Diomedes on their northward migration in spring and again when they move south in autumn. They are not present around the islands during summer.

Harbor Porpoise

One harbor porpoise was caught in a salmon net near Unalakleet in June 1981. Four sightings of harbor porpoises have been reported in the northern Norton Sound region, all four from near Nome. Three were caught in salmon nets in June-August. The fourth sighting was of three porpoises seen just offshore from Nome in late September 1981.

Harbor porpoises have been reported twice off Cape Woolley in October 1966 and 1976.

Minke Whale

Based on observations in 1981, minke whales may occur regularly near Golovnin Bay. They were observed on 5 and 6 June and on 10 October near the mouth of the Bay.

Minke whales have been reported from around St. Lawrence Island in summer. We know nothing further about their distribution and abundance in that region.

Gray Whale

Gray whales have been reported in the Nome area from May until October. On at least two occasions they remained in a local area for 1 to several hours. On 4 July 1962, one was caught in a fish net at Cape Nome.

Gray whales have been sighted off Cape Douglas and Cape Prince of Wales in June and July. On 1 July 1977, 30-50 were apparently feeding off Cape Prince of Wales.

Gray whales are present around St. Lawrence Island from at least May until October. They are particularly abundant to the north and northeast of the island, where they feed throughout the summer. Their major summer feeding grounds, the Chirikof Basin, are just north of St. Lawrence Island .

Gray whales are seen around the Diomedes during the summer months.

VII. Discussion

A. Steller Sea Lion

Sea lions occur in large numbers in the North Aleutian and Saint George basins. They are present there year-round and gather annually at traditional rookeries to pup and breed. Pups are born in mid-May to mid-July and do not leave the rookeries to accompany their mothers on feeding forays until they are 4-5 weeks of age (Sandegrin 1970).

Sea Lion Rocks is the only large rookery along the northern Alaska Peninsula. Since 1975, about 2,000 sea lions have hauled out there in June through August. By October that number decreases somewhat to 1,100 to 1,800. Nearby Amak Island is used as a haulout but according to Braham et al. (1977a) is not a rookery. The only other only confirmed active rookery in the eastern Bering Sea (excluding the Aleutian Islands) is Walrus Island in the Pribilofs. In the summers of 1954 and 1960, 6-8,000 sea lions were present there, about 3,000 of which were pups. Prior to the breeding season in April 1977 and 1979, 1,500-3,000 sea lions of all ages and both sexes were hauled out there. The most recent count in August 1981 indicated that about 1,200 males, females, and pups were hauled out on Walrus Island. Although other areas in the Pribilofs were used as rookeries in the 1700's and 1800's, Kenyon (1962a) reported that no pups had been reported as being born there in recent years. However, in summer 1982, there was an unconfirmed report by Aleut residents that pups were present at Dalnoi Point on St. George Island.

Sea lions haul out throughout the year at many locations that may or may not be used as rookeries during the summer (Fig. 16). Animals using those haulouts during summer are usually all males and subadults since breeding adult females are restricted to the breeding rookeries. Major nonbreeding haulouts used annually by 1,000 or more animals occur on Amak Island, St. George Island (principally Dalnoi Point), and Cape Newenham. Smaller groups regularly haul out on St. Paul Island, Otter Island, Round Island, South Twin Island, Nunivak Island, St. Matthew Island, Hall Island, Pinnacle Island, and St. Lawrence Island. Sea lions are irregular visitors to Sledge Island, the Diomede Islands, and Fairway Rock. There are no major hauling areas on the mainland coast north of Cape Newenham. In most of the region, sightings have occurred from April through November. In the northern Bering Sea, sea lions generally move southward with the formation of seasonal sea ice.

Although it is difficult to compare counts from year to year, sightings over the last 4 decades suggest that sea lions are less abundant along the Alaska Peninsula and in the Pribilofs (Table 18) and more abundant in northern Bristol Bay (Table 19) in the early 1980's than they were in the 1950's and 1960's. Braham et al. (1980) presented evidence for at least a 50% decline in numbers of sea lions in the eastern Aleutians between the late 1950's or early 1960's and 1975-77.

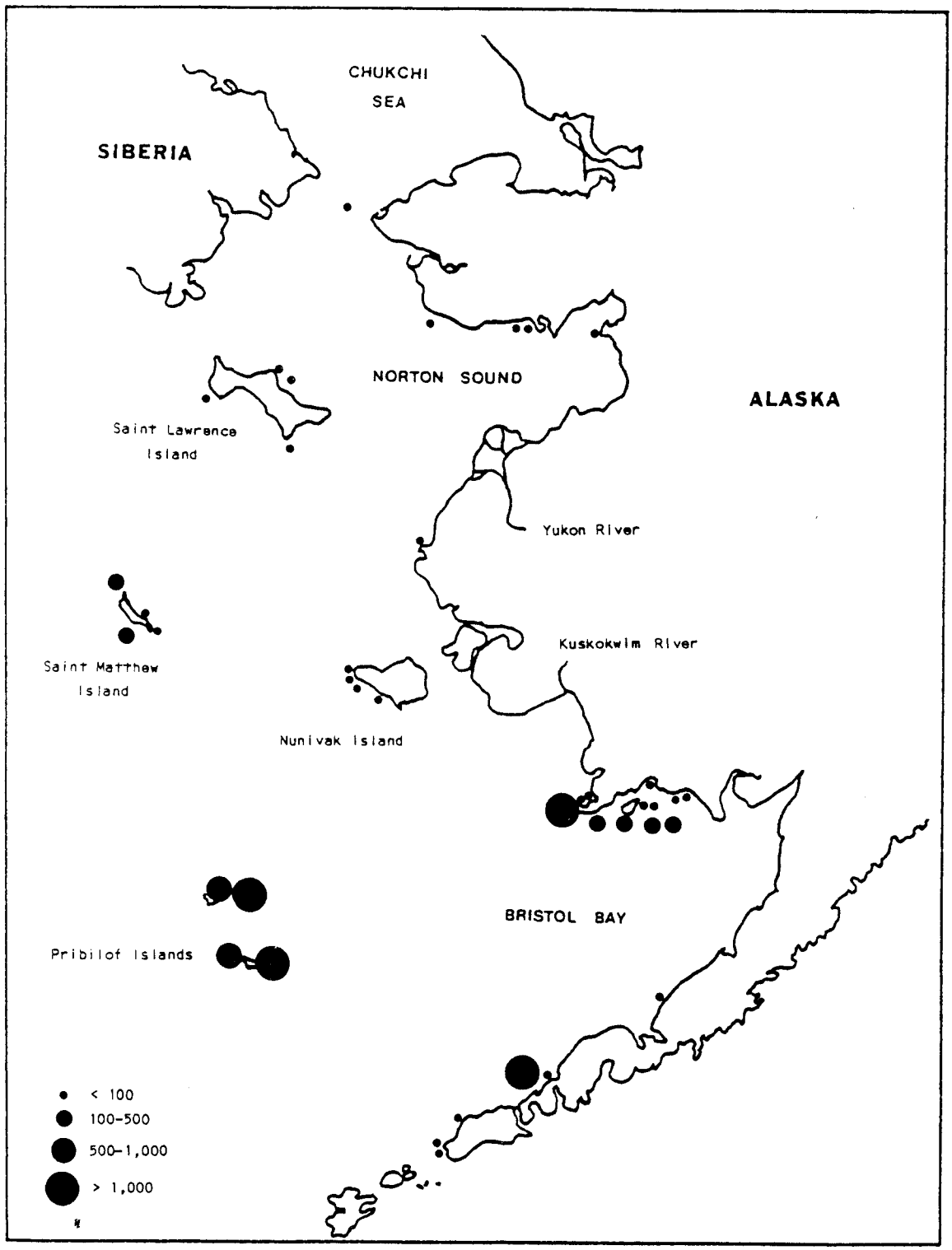

Figure 16. Map of the eastern Bering Sea showing locations where Steller sea lion haulouts have been recorded.

Table 18. Maximum recorded numbers of sea lions hauling out on Unimak and Amak islands, Sea Lion Rocks, and the Pribilof Islands from 1959 through 1982. Summer counts do not include pups since they are difficult to accurately enumerate.

	1950's	1960's	1970's	1980's
Unimak Island	--	4,200	60	--
Amak Island	3,000	2,000	2,300	2,400
Sea Lion Rocks	4,700	3,500	2,900	1,600
Pribilof Islands Walrus Island	3-4,000	4-5,000	3,000	900
Approximate Totals	12,000	14-15,000	9,000	5,000

Table 19. Maximum recorded numbers of sea lions hauling out in northern Bristol Bay from 1957 through 1982.

	1950's	1960's	1970's	1980's
Northern Bristol Bay coastline	present	hundreds	many	50-60
Hagemeister Island	--	--	150 (summer)	--
High Island	--	--	50 (summer)	--
Crooked Island	--	--	50 (summer)	--
Twin Islands	--	400 (Apr)	--	--
South Twin Is.	300 (Aug)	--	200-300 (Jul)	--
North Twin Island	21 (Jun)	--	100-150 (Jul)	--
Round Island	--	--	400-500 (Jul)	400-500 (summer)
Black Rock	--	--	6 (Jun)	--
Cape Peirce	--	--	--	450 (Jun)
Cape Newenham	250 (Jul-Aug)	--	800 (May)	1,500 (summer)
Approximate Totals	6-700	6-700	2,000	2,400-2,500

Sightings since then on Amak Island and Sea Lion Rocks suggest that sea lion numbers have remained lower and possibly declined even further. A similar trend is evident on the Pribilofs, where the number of breeding adults on Walrus Island has decreased from 3-5,000 in the 1950's and 1960's to 900 in summer 1981. On Otter Island, primarily a winter haulout, numbers appear to have remained fairly constant. In contrast, more sea lions are apparently hauling out in northern Bristol Bay in summer. About 600 were counted on the coast and islands in the late 1950's, whereas over 2,000 were there in the late 1970's and early 1980's. The causes for these apparent changes in numbers are unknown. However, Braham et al. (1980) suggested that the decline in the eastern Aleutians might correspond to a concurrent increase in commercial groundfish fisheries in that area. It is possible that, because of reduced fish stocks in more southern areas, increasing numbers of sea lions are moving to northern Bristol Bay to feed on the large herring and capelin spawning concentrations in that area.

B. Harbor Seal

Harbor seals are resident in coastal waters of the southeastern Bering Sea throughout the year. They do not migrate long distances like their ice-associated relatives, the spotted seals. In many parts of their range, harbor seals are widely dispersed along rocky coastlines and do not form major concentration areas or rookeries. Along the north coast of the Alaska Peninsula, this is not the case. Everitt and Braham (1980) listed 14 locations where a combined minimum of about 25,000 harbor seals hauls out. In aerial surveys conducted in June and August 1975-77, 75-92% of the seals counted were at three of those locations: Port Moller, Port Heiden, and Cinder River. The addition of three other locations (Seal Islands, Izembek Lagoon including Moffet Point, and Isanotski Islands) raises that to 94-99% of the total. All of these areas are rookeries where pups are born, as well as haulouts where seals rest and molt. The seals haul out on sandspits and bars exposed by the tides, with more seals hauled out at low tides than at high tides. Peak use occurs in June and July and apparently tapers off in September and October, when seals spend a greater proportion of their time in the water.

The only major haulout area for harbor seals in northern Bristol Bay is in Nanvak Bay. Both harbor seals and spotted seals are present, with harbor seals comprising about 90% of the total. Some harbor seal pups are born in Nanvak Bay in June and July, but peak numbers of animals occur during the molt in August and September, when a maximum of about 3,000 seals has been counted. Along most of the northern Bristol Bay coast, harbor seals are present in rocky coves and around rocky islands in relatively small numbers. It is not known what proportion of harbor seals in a given area those close to shore may represent. The two largest reported haulouts are at the southern end of Hagemeister Island and on Black Rock; 200-300 seals have been observed at each location. Seals in Bristol Bay are often seen in association with

schools of fish. There are major herring and/or capelin spawning areas all along the northern Alaska Peninsula from Izembek Lagoon to Ugashik Bay and in northern Bristol Bay from Metervik Bay to Cape Newenham, including Hagemeister Island (Barton 1979). Spawning smelt (Osmerus mordax) and eulachon (Thaleichthys pacificus) are also present in many of those areas.

In the Saint Matthew-Hall Basin, harbor seals and spotted seals are sympatric, and in many instances it is difficult to determine which species is present. The usual northernmost limit of harbor seals is about Kuskokwim Bay and Nunivak Island, whereas the usual southernmost limit of spotted seals during summer is approximately Nanvak Bay. Thus, for at least 200-300 km of coastline, their ranges overlap. (Occasional harbor seals have been reported as far north as St. Lawrence Island and spotted seals south to the Alaska Peninsula). The largest haulout areas within harbor seal range are the offshore sandbars near Quinhagak and Jacksmith Bay and those at the mouth of the Kuskokwim River. Dark-coated pups have been observed at both of those areas in July, indicating that some or all of the seals there at that time are harbor seals. Earlier in the season, in mid-May, spotted seals with white-coated pups are present near Quinhagak. It is unknown where the harbor seals that haul out in Nanvak Bay and Kuskokwim Bay in summer go during winter when the ocean freezes. It is possible that they move to the major hauling areas along the Alaska Peninsula. If so, this would represent the longest known regular seasonal movement by harbor seals. It is over 320 km from the mouth of the Kuskokwim River to hauling areas on the Alaska Peninsula.

In spring, spotted seals are present on the ice around Nunivak Island. During the remainder of the year, relatively stable numbers of seals are found around the island, where they haul out on rocky points, islets, and coves. It is unknown whether these are harbor or spotted seals; however, four seals collected near Cape Mendenhall in October 1981 were harbor seals. It is probable that in summer there are mostly harbor seals with a few spotted seals, while in spring and autumn the reverse is true. Seals are apparently most abundant in two areas: the southeast end near Cape Mendenhall and the northwest end from Cape Mohican to Kigoumiut Bay.

Harbor seals also occur on the Pribilof Islands. They are regularly present in small numbers on St. George and St. Paul islands. Otter Island is the major haulout and rookery, where up to 1,300 seals may haul out and as many as 250 pups are born each year.

Major harbor seal and spotted seal haulouts in the Bering Sea are shown in Figure 17.

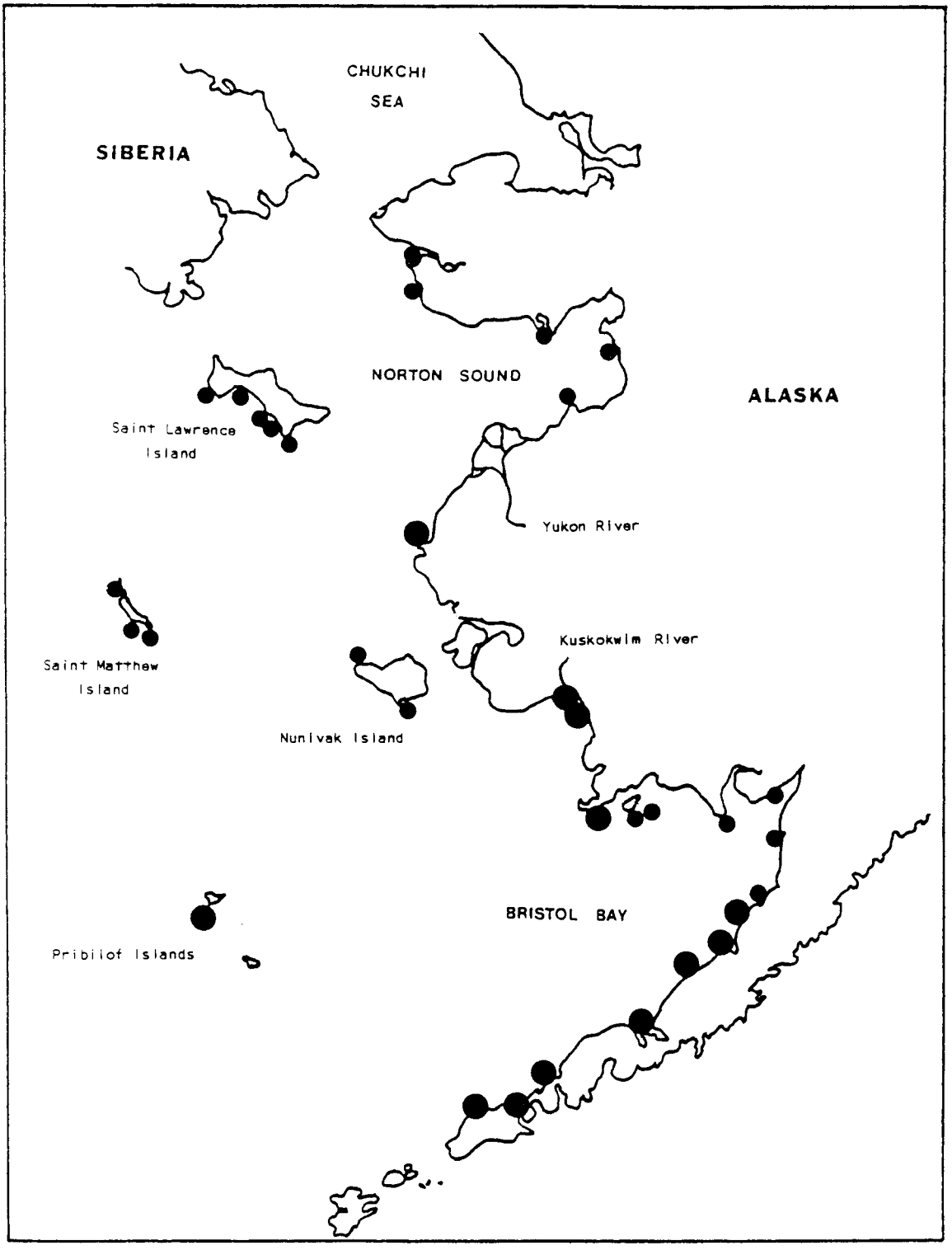

Figure 17. Map of the eastern Bering Sea showing major haulouts used by harbor and spotted seals. Large dots represent areas with maximum reported numbers of greater than 500 seals. Small dots represent haulouts of 100-500 seals.

C. Spotted Seal

In late winter and spring, spotted seals are distributed in and near the ice front of the Bering Sea, where they have their pups, breed, and molt from March to May or June. As the ice disintegrates and recedes north in spring, these seals move generally northward and toward the coast, where they spend the ice-free months feeding mainly in nearshore waters and hauling out on land (Fig. 17). Spotted seals remain in the coastal zone until late autumn or early winter, when the shorefast ice begins to form.

Areas of the North Aleutian Basin and Saint Matthew-Hall Basin where spotted and harbor seals co-occur were discussed in the previous section. Spotted seals occur in spring through autumn throughout the coastal regions of Saint Matthew-Hall Basin, including St. Matthew, Hall, and Nunivak islands and the coast of the Yukon-Kuskokwim Delta. Five or six hundred haul out at two main locations on St. Matthew Island and at one location on Hall Island. They are presumed to be spotted seals, based on a single animal collected in August 1973. Along the mainland coast, the largest haulout regularly used by spotted seals is Scammon Bay, where over 1,000 seals may be present. There are no major haulouts along the Yukon delta, although spotted seals are regularly present there in late summer and autumn.

From late May to July, and in some years to as late as August, herring and capelin spawn in northern Bristol Bay and along the coast of the Yukon-Kuskokwim Delta (Barton 1979). The distribution of major spawning areas for those species corresponds well to the distribution of major haulout areas for spotted and harbor seals. Spawning capelin and/or herring are found near Nanvak Bay, Cape Newenham north to Security Cove and Chagvan Bay, Goodnews Bay, Carter Bay, Quinhagak, Kwigillingok to Kipnuk, Toksook Bay to Tanunak, parts of Hazen Bay, Hooper Bay, Scammon Bay, and around Nunivak Island. Seals are reported from all of those areas, and each of the major haulouts is near one of those spawning locations. At many locations the appearance of large numbers of seals coincides with the arrival of schools of herring, capelin, salmon, or other forage fish.

Spotted seals are present during the ice-free months throughout Norton Basin, including Norton Sound, the southern Seward Peninsula, and St. Lawrence Island. They haul out on both rocky coastline and sandy beaches. There are no haulouts as large as those in Bristol Bay, but one to several hundred spotted seals regularly use areas near Stebbins/St. Michael, Besboro Island, Golovnin Bay, Cape Woolley, and Port Clarence. There are three major spotted seal haulouts on the south side of St. Lawrence Island, although they may haul out on rocks and bars along the entire south side of the island. Along the mainland coast, spotted seals are reportedly more abundant, or at least haul out in greater numbers and are more conspicuous, in late spring and autumn. As along the Yukon-Kuskokwim coast, the presence of seals

often coincides with the arrival of schools of spawning herring or salmon. They leave as the shorefast ice begins to form.

D. Pacific Walrus

During the ice-free months, walruses haul out at many locations in the eastern Bering Sea. However, although we have collected sightings of animals hauled out at 39 specific locations, only 12 of those are regularly used by substantial numbers of animals (Fig. 18). Six of those locations are in the North Aleutian Basin, one is in the Saint Matthew-Hall Basin, and five are in the Norton Basin. Haulouts are generally in locations remote from civilization and, as indicated by Burns (1965), are generally on rock or gravel beaches near high promontories of islands or at the base of headlands projecting into the sea.

Available information on major walrus hauling areas in the eastern Bering Sea is summarized in Table 20. Fay (1957) stated that at that time the only regularly frequented hauling area in Alaska was the Walrus Islands in Bristol Bay. He also carefully documented the historical use of haulouts in the Bering and Chukchi seas. After 1960 and prior to 1978, eight locations were in regular use, all of which were probably traditionally used in the 1800's and early 1900's (Fay 1957). Based on available sightings, four additional hauling areas have become established since 1978. Although it is possible that walruses occasionally hauled out at Cape Seniavin and Cape Newenham prior to our first records in the 1960's and 1970's, St. Matthew and Hall islands were regularly visited by scientific parties, and King Island was annually inhabited by Eskimo hunters. Therefore, it is reasonable to assume that these are recently established haulouts, probably in some way resulting from the increase in size of the walrus population (Fay 1982). In almost all cases (Table 20), the maximum numbers of walruses seen on each haulout also have occurred in recent years. The only area which was definitely not used in historical times is King Island. Walruses did not haul out there when the village on the island was inhabited (Burns, unpubl.). The only major historical haulout that has not been reoccupied is on the Pribilof Islands, where thousands of males hauled out prior to their extirpation by commercial hunters.

Most of the major walrus haulouts in the southeastern Bering Sea are used principally by male walruses during late spring and summer (April-September). These animals do not follow the rest of the population on its northward migration but rather remain in the Bristol Bay region where they haul out to rest between feeding forays (Fay and Lowry 1981, Fay 1982). Most of this summering group moves westward in late autumn and winter to join groups of females and subadults on the sea ice.

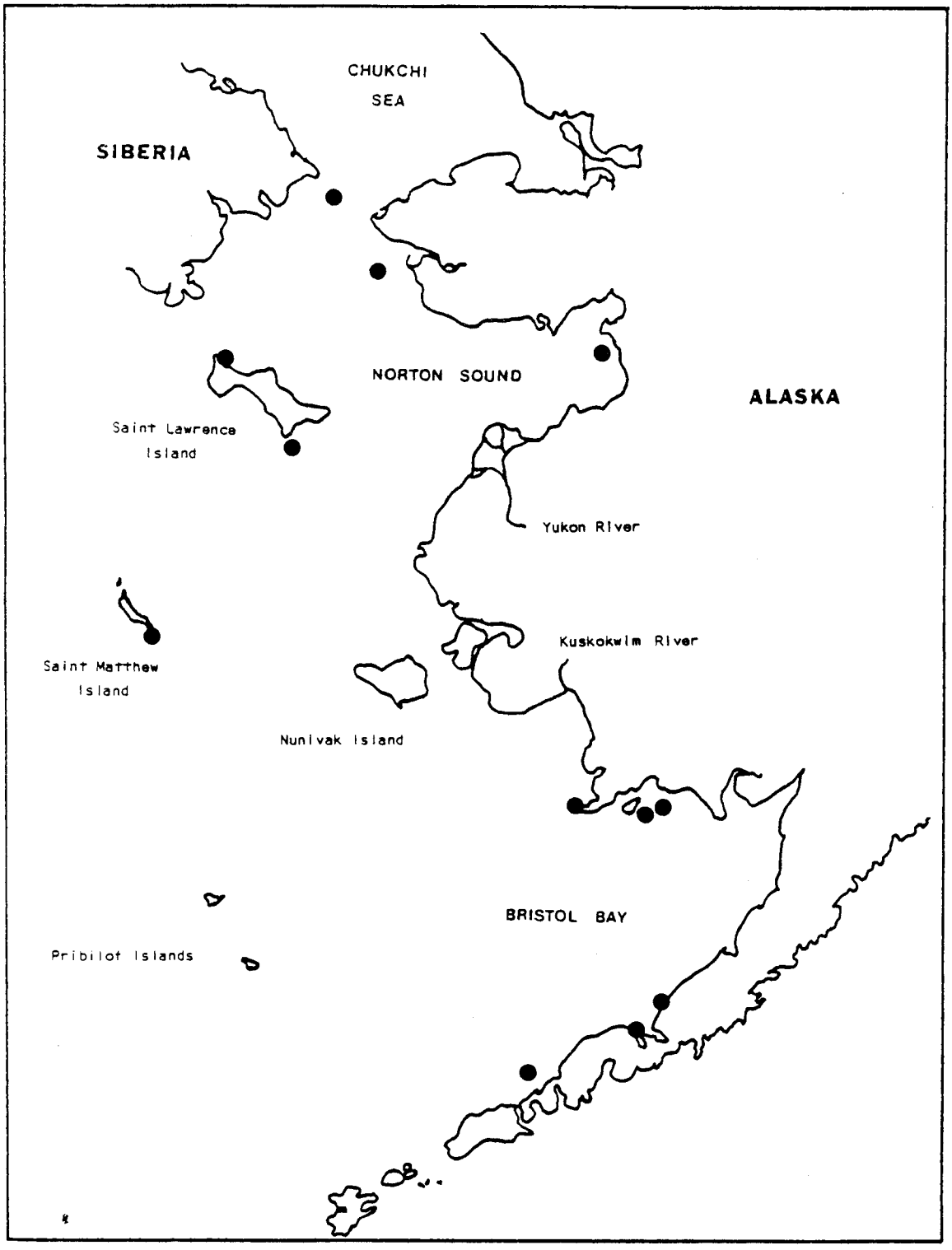

Figure 18. Map of the eastern Bering Sea showing major known haulouts of walruses.

Table 20. Summary of information on major walrus hauling areas in the eastern Bering Sea. Only those haulouts used in 2 or more consecutive years by more than 100 walruses are included.

Location	Documented "historical" use	Year of first recent sighting	Year of most recent sighting	Months used	Maximum number observed
Amak Island	yes	1962	1979	Apr-Oct	500 - Jun 1979
Port Moller	yes	1968	1982	Jan-May	2-4,000 - Apr-May 1979
Cape Seniavin	?	1978	1981	Apr-May	1,500-2,000 - Apr 1981
Big Twin Island	yes	1953	1976	May-Aug	1,000 - Jun 1976
Round Island	yes	1953	1981	Feb-Nov	11,600 - Jun and Aug 1980
Cape Newenham	?	1978	1981	Apr-Jul	450-500 - Jun 1978
Pribilof Islands	yes	--	--	--	--
St. Matthew and Hall islands	yes	1978	1982	Jul-Sep	550 - Sep 1980
Besboro Island	yes	1961	1981	Jun-Aug	200-400 - Jun-Jul 1963
Punuk Islands	yes	1930's	1981	Jun-Dec	50-60,000 - Oct-Nov 1978
St. Lawrence Island Chibukak Point	yes	1956	1981	Oct-Dec	"hundreds" - Nov-Dec 1978
King Island	no	1979	1982	Jun-Sep	5,000 - Jun-Sep 1980
Big Diomede Island	yes	1968	1981	Sep-Dec	5-10,000 - late 1970's and 1980's

The function of haulouts and seasonal cycle of animals using St. Matthew and Hall islands are probably similar to that described for Bristol Bay. Groups of animals that have been seen on Nunivak Island along the mainland coast of Kuskokwim Bay and the Yukon River delta are probably in transit on their spring or autumn migration.

In the northern Bering Sea and Norton Basin, hauling areas are of two principal types. The regularly used locations on Besboro and King islands, and occasional haulouts such as Egg Island, Cape Darby, and Sledge Island, are resting areas for animals during the summer feeding season. Most of these animals are adult males, although some females and juveniles occur on King Island (Burns, unpubl.). Hauling grounds on Big Diomede Island, St. Lawrence Island, and the Punuk Islands are centrally located in the walrus migratory path and are used in October through December by animals which are on their southward migration. The Diomede Islands are now used both as a summer haulout by males as well as a resting place for animals of both sexes during autumn. Fay and Kelly (1980) described an event in October-November 1978 when tens of thousands of walruses, including juveniles and adults of both sexes, hauled out at several locations on the Punuk Islands and St. Lawrence Island. If, as they suggest, animals hauled out on the eastern portion of St. Lawrence Island only when the Punuks were fully occupied, the total number of animals using the area would be 94-148,000, depending on whether or not the three areas on St. Lawrence Island were simultaneously occupied.

Although there have been no systematic attempts to annually census all major walrus haulouts in the eastern Bering Sea, available records suggest some features of their development and persistence. The best documented case is the Walrus Islands complex in northern Bristol Bay. Although walruses haul out occasionally on most of the islands in the group, Round Island is now the only one that is used regularly. The first record of walruses in the area was in 1935, when eight animals were seen on or near Hagemeister Island. In May 1953 a total of 1,000 animals was counted on Round Island and Big Twin Island. In late July of that year, 1,100 animals were on High Island and Big Twin Island, and none were seen on Hagemeister Island or Round Island. In May 1958, 2,500-3,000 walruses were seen on Round Island, 300 on Big Twin Island, and none on Hagemeister or High islands. Few observations were made during the 1960's and early 1970's. By 1976, most of the walruses were regularly using only Round Island, with occasional large sightings on Big Twin Island. Numbers of animals seen on Round Island have steadily increased until at least 1981, when more than 11,000 animals were counted on the haulout.

South of the Walrus Islands, three areas along the Alaska Peninsula have also been major walrus haulouts. We have records of a few hundred animals on Amak Island from 1962 through 1979 and of occasional large numbers in the vicinity of Port Moller since 1968. Beginning in 1978, 1-2,000 walruses have hauled out at Cape Seniavin for a brief period in April and May. This group is definitely related to the Round Island

walruses since an animal that was tagged at Round Island was found dead at Cape Seniavin. It appears that since the major development of the Cape Seniavin haulout in 1980-81 walruses may no longer be regularly using Amak Island; none have been seen there after 1979 in nine surveys of the area. Fay and Lowry (1981) indicate that although only 1-2,000 walruses were seen hauled out at Cape Seniavin in April 1980 and 1981, 5-14,000 walruses were in the Alaska Peninsula region between Port Moller and Ugashik. During other months of the year, most walruses appear to be in the central and northwestern portions of Bristol Bay.

E. Belukha Whale

Belukhas spend the winter months offshore in the pack ice of the Bering Sea. In spring, as the ice begins to melt and recede northward, they move toward the coast. Some remain in the Bering Sea in Bristol Bay, along the Yukon-Kuskokwim coast, and in Norton Sound throughout the summer. Others travel north through Bering Strait to spend the summer in Kotzebue Sound, along the Chukchi coast north to Barrow, or in the eastern Beaufort Sea near the Mackenzie delta. Of an estimated population of 12-16,000, about 3,000 spend the summer in coastal regions of the Bering Sea.

There are three main concentration areas in the Bering Sea: inner Bristol Bay in Kvichak and Nushagak bays, off the mouths of the Yukon River, and northeastern Norton Sound from Golovnin Bay to and including Norton Bay (Fig. 19). Belukhas arrive in Kvichak Bay in April and May and usually slightly later in Nushagak Bay. They are seen in both areas throughout the summer, although there may be a directional movement from the Kvichak to the Nushagak in June or early July. The relationship between and the interchange among animals in the two areas are poorly understood. While in Kvichak and Nushagak bays, belukhas feed on smelt, outmigrating salmon fingerlings, and, after about mid-June, mostly adult salmon. Some ascend the rivers 16-32 km daily, while others remain in the bays, feeding over the extensive shallow tidal flats. Calving occurs in June and July. Large numbers of belukhas were present and calving in the shallows from the Igushik River to the Snake River in early July 1982. No similar "calving areas" have been identified in Kvichak Bay. Belukhas are commonly seen in Kvichak and Nushagak bays through August. There are few sightings there after that time. Presumably, the whales move offshore for the winter.

Belukhas are seen along the Yukon-Kuskokwim coast from spring through autumn. Although prior to the 1950's there may have been several major concentration areas, sightings in recent years have been irregular and of small numbers of animals. Moderately large groups of belukhas are seen feeding off the mouths of the Yukon River. They appear in May and June with the first salmon runs and remain until late September or October, by which time the salmon runs have diminished and the belukhas feed on saffron cod, which are abundant in the area.

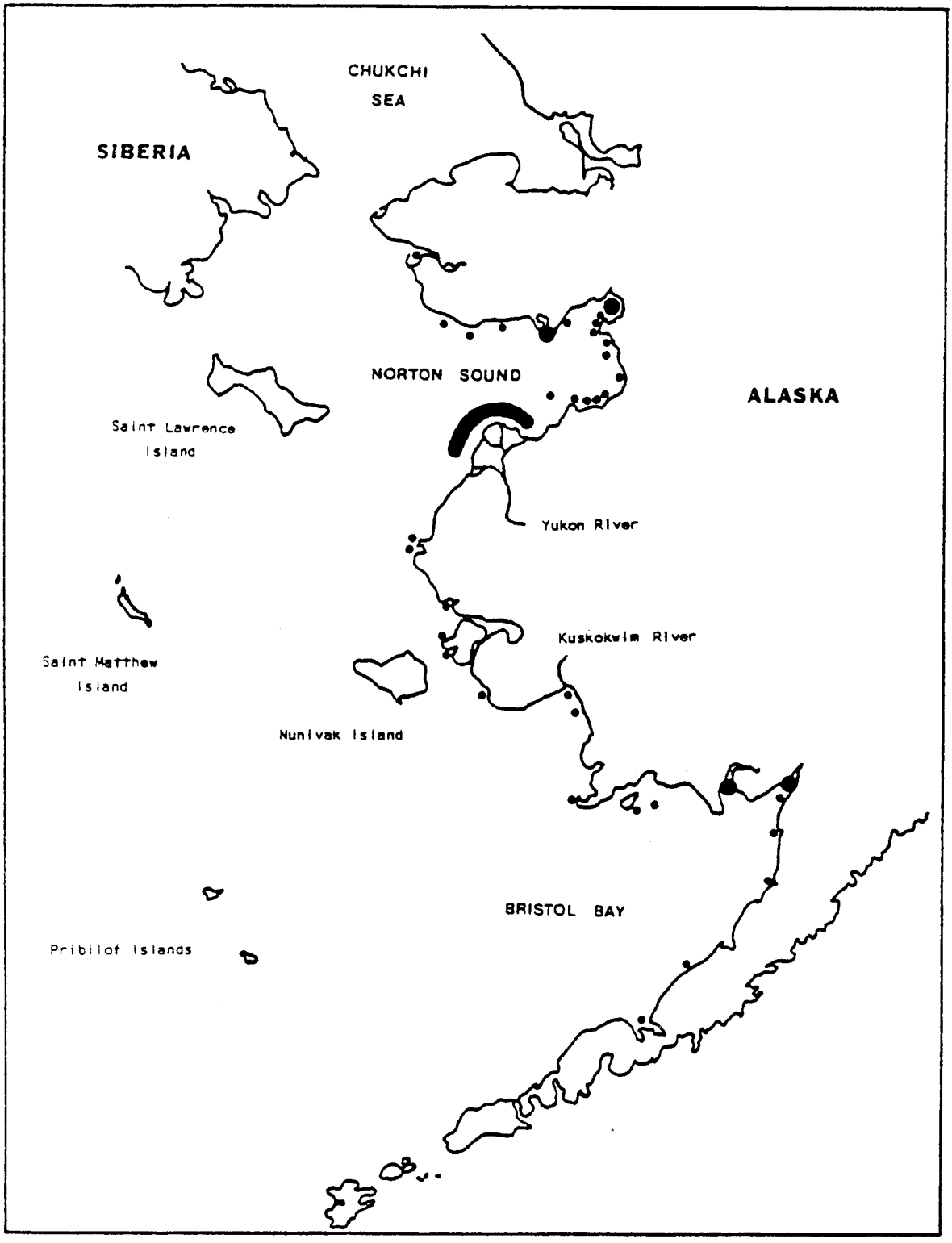

Figure 19. Map of the eastern Bering Sea showing sightings of belukha whales in the coastal zone. Small dots represent individual sightings. Large dots represent major concentration areas.

Belukhas occur throughout Norton Sound, but are particularly abundant in Norton and Golovnin bays. They are first seen in Norton Sound when the ice breaks up in April and are common along the coast from Stebbins to Norton Bay in April to mid-June, when they feed on schools of spawning herring and later on salmon. Belukhas are most frequently sighted in inner Norton Sound during spring and autumn and are apparently less common in summer. Some area residents believe they spend the summer off the mouths of the Yukon. In autumn, after the salmon runs are over, belukhas follow and feed on large schools of saffron cod found in nearshore areas such as St. Michael and Golovnin Bay. In several recent years, groups of up to several hundred have been seen feeding off Cape Nome in mid- to late November. Historically, belukhas were reported to be common in Grantley Harbor but in recent years have been seen there only occasionally and in small numbers. Belukhas are common around St. Lawrence Island, particularly the south side, during winter and spring but migrate north or toward the coast for the summer and autumn. They are rarely seen around either St. Lawrence Island or the Diomede Islands in summer.

F. Harbor Porpoise

Harbor porpoises are present along the entire coastal zone of western Alaska, but because they are difficult to see in anything but calm water there are relatively few reported observations (Fig. 20). Most sightings were of two to four individuals. The largest was of 16 animals feeding on capelin at the southeast end of Nunivak Island in June. Four of the reports from Norton Sound and one from the southern mouth of the Yukon were of harbor porpoises caught in salmon gillnets. However, those individuals from Norton Sound were not feeding on salmon but rather on saffron cod, which are extremely abundant in the Sound. Most sightings have been in June through August. The earliest was in April off the Alaska Peninsula, and the latest was in October off Cape Woolley northwest of Nome.

Harbor porpoises have been reported from the vicinity of Point Franklin to Point Barrow, Alaska (Hall and Bee 1954, Bee and Hall 1956) and from the Mackenzie River delta (Van Bree et al. 1977).

G. Killer Whale

Killer whales are seldom seen in the coastal zone of the Bering Sea. We located only one sighting of killer whales while preparing this report. That was of a single whale apparently feeding on salmon in northeastern Bristol Bay in June 1981. Other published sightings are described in section III and include the north side of the Alaska Peninsula; the Pribilof Islands; Bristol Bay; and St. Lawrence and King islands and the Diomede Islands (Fig. 21).

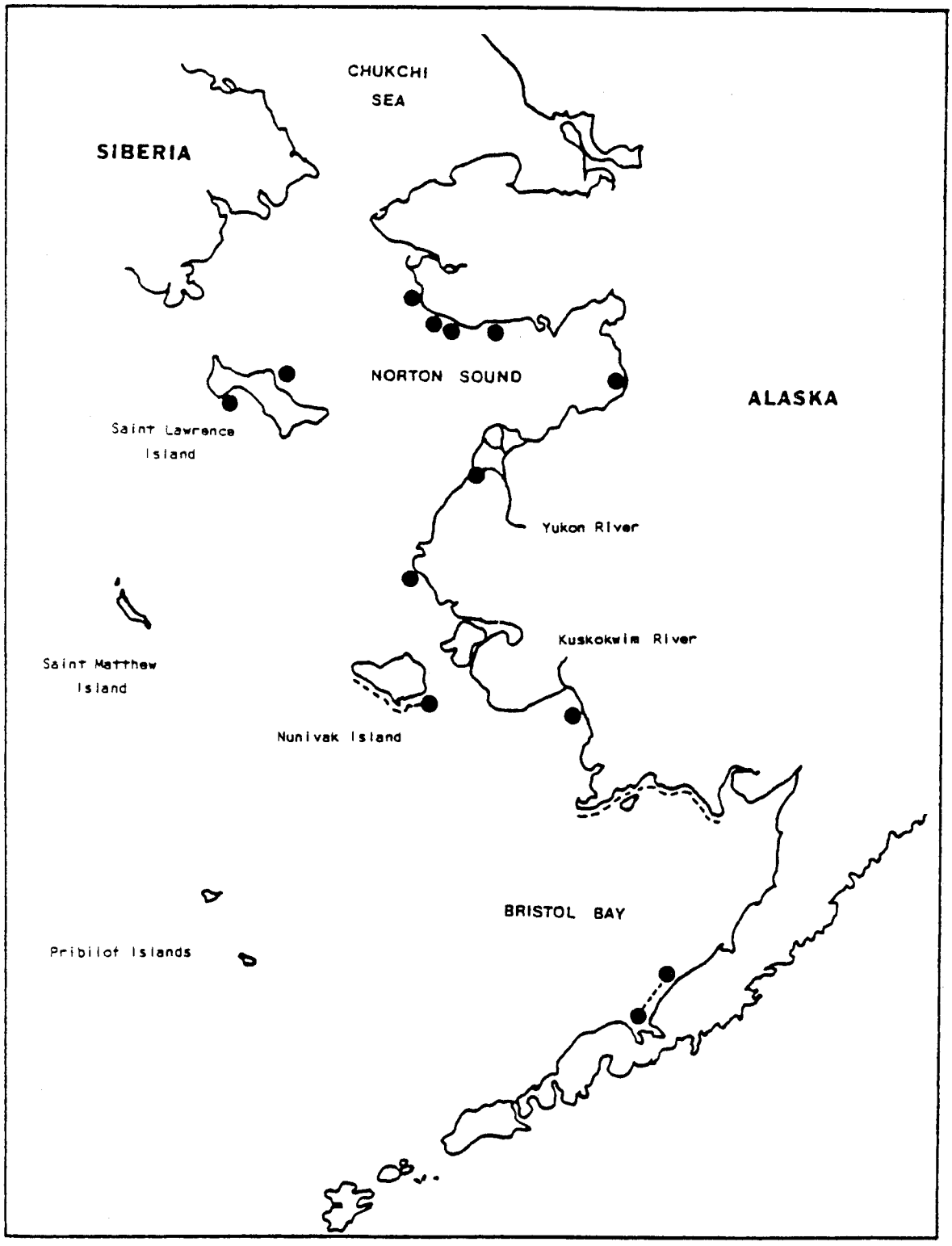

Figure 20. Map of the eastern Bering Sea showing sightings of harbor porpoises in the coastal zone.

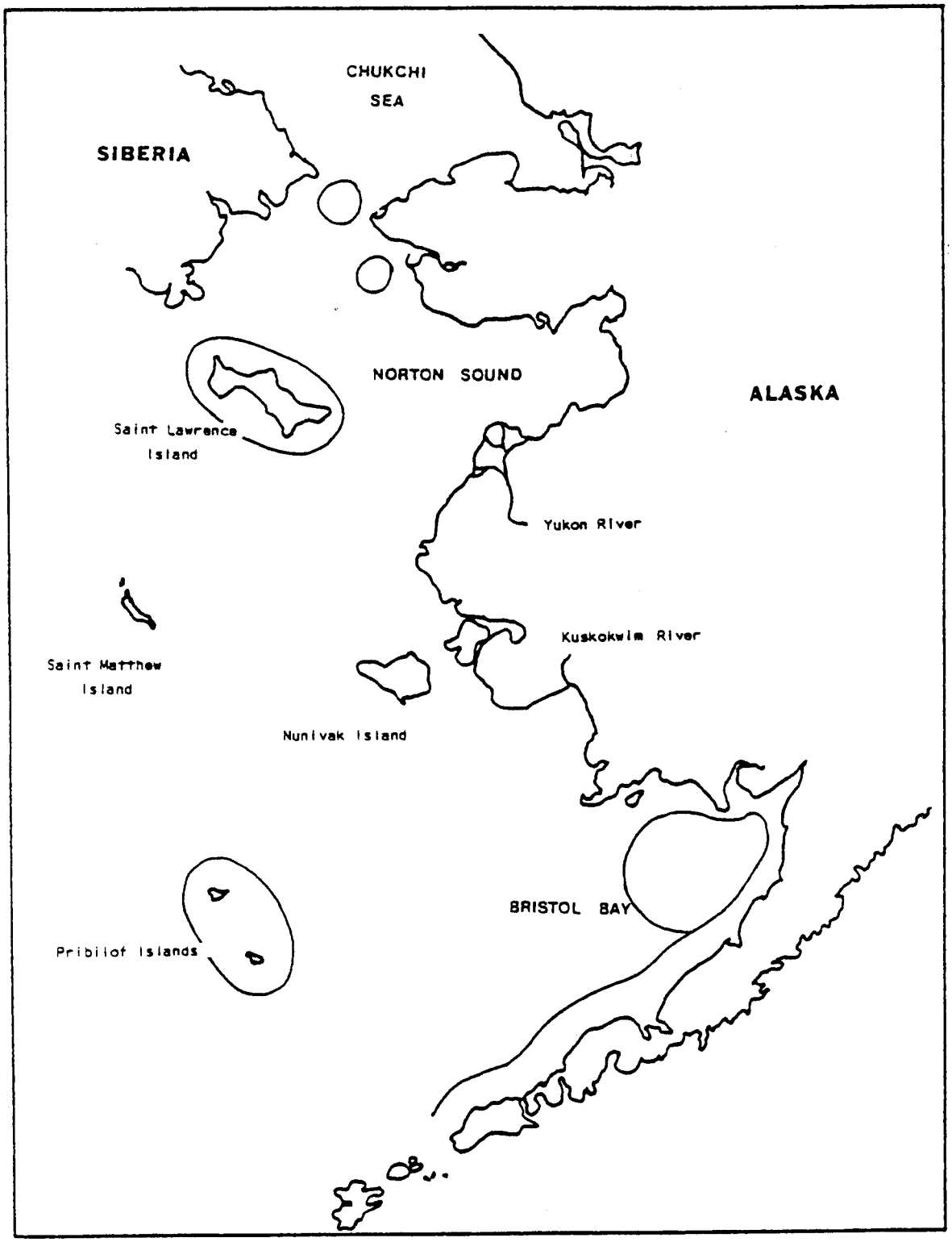

Figure 21. Map of the eastern Bering Sea showing areas where the presence of killer whales has been reported.

H. Minke Whale

We located relatively few sightings of minke whales in the coastal zone. They ranged from Unimak Island north to St. Lawrence Island and Golovnin Bay (Fig. 22). Sightings were made from April to October, with most in June. Most were of one or two individuals. One was reported taken by hunters from Gambell in August 1981 (Dronenberg et al. 1982).

I. Gray Whale

Information on the distribution and migration of gray whales is currently being compiled and summarized (Swartz et al., in prep.). Sightings accumulated by this project have been provided to the authors of a chapter for that book and will be incorporated with other data to produce a more complete picture of the distribution of gray whales in the Bering Sea.

Gray whales migrate annually from the coastal waters of Baja California and the southern Gulf of California to the northern Bering and southern Chukchi seas. They follow the coast closely as they move north along California, Oregon, Washington, Canada, and the Gulf of Alaska and enter the Bering Sea mostly through Unimak Pass in April through June. Prior to work conducted in the mid- and late 1970's, the literature suggested that, after moving through Unimak Pass, gray whales swam northward and toward the west end of St. Lawrence Island (Pike 1962). However, based on aerial surveys conducted in the Bering Sea in the mid-1970's, Braham et al. (1977a) suggested that gray whales remain near the coast considerably farther north on their migration, moving along the Alaska Peninsula, the northern coast of Bristol Bay, and then to the east end of St. Lawrence Island. Our sightings (Fig. 23) confirm those suggestions. Gray whales were regularly seen very close to the shore along the Alaska Peninsula east to Johnson Hill and then along the northern Bristol Bay coast from Cape Constantine to Cape Newenham. Few whales were seen in Kuskokwim Bay. They apparently swim directly from Cape Newenham to Nunivak Island. Most then move along the south side of Nunivak; a few have been sighted in Etolin Strait. We located no coastal sightings north of Nunivak until the whales reached St. Lawrence Island or Nome, where they may be seen from May or June until October. Most gray whales spend the summer feeding in the Chirikof Basin and Chukchi Sea. Some also feed quite close to shore at the southeastern and southwestern ends of St. Lawrence Island (Braham et al. 1977a). A few (up to 30 have been counted) remain and feed in Nelson Lagoon from April until October or November.

A few gray whales have been sighted around the Pribilofs in summer, and some whales are probably present there each year. They are also sighted around St. Matthew and Hall islands in June through August. In summer 1982, gray whales were regularly observed feeding within 1 km of the shore of St. Matthew Island.

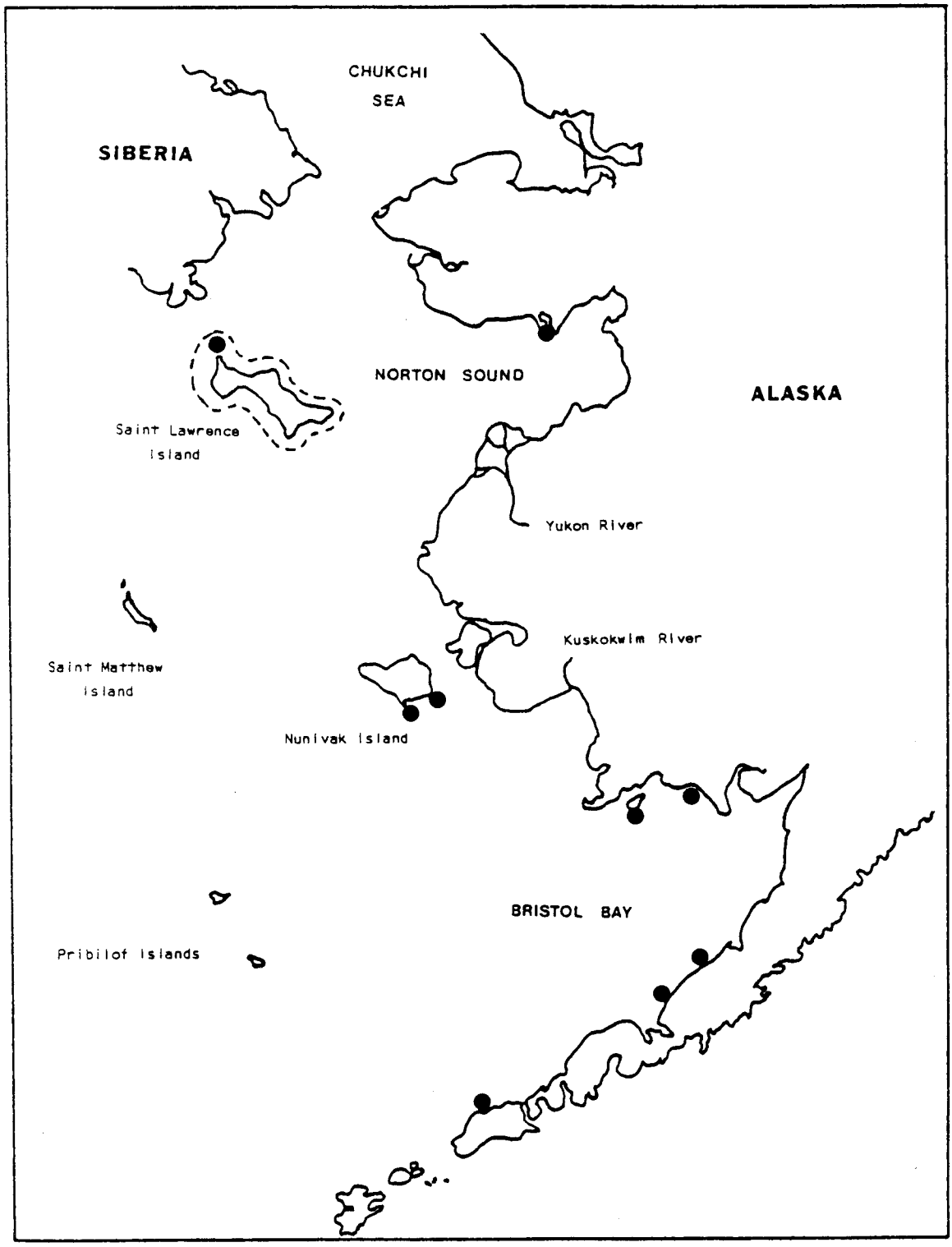

Figure 22. Map of the eastern Bering Sea showing sightings of minke whales in the coastal zone.

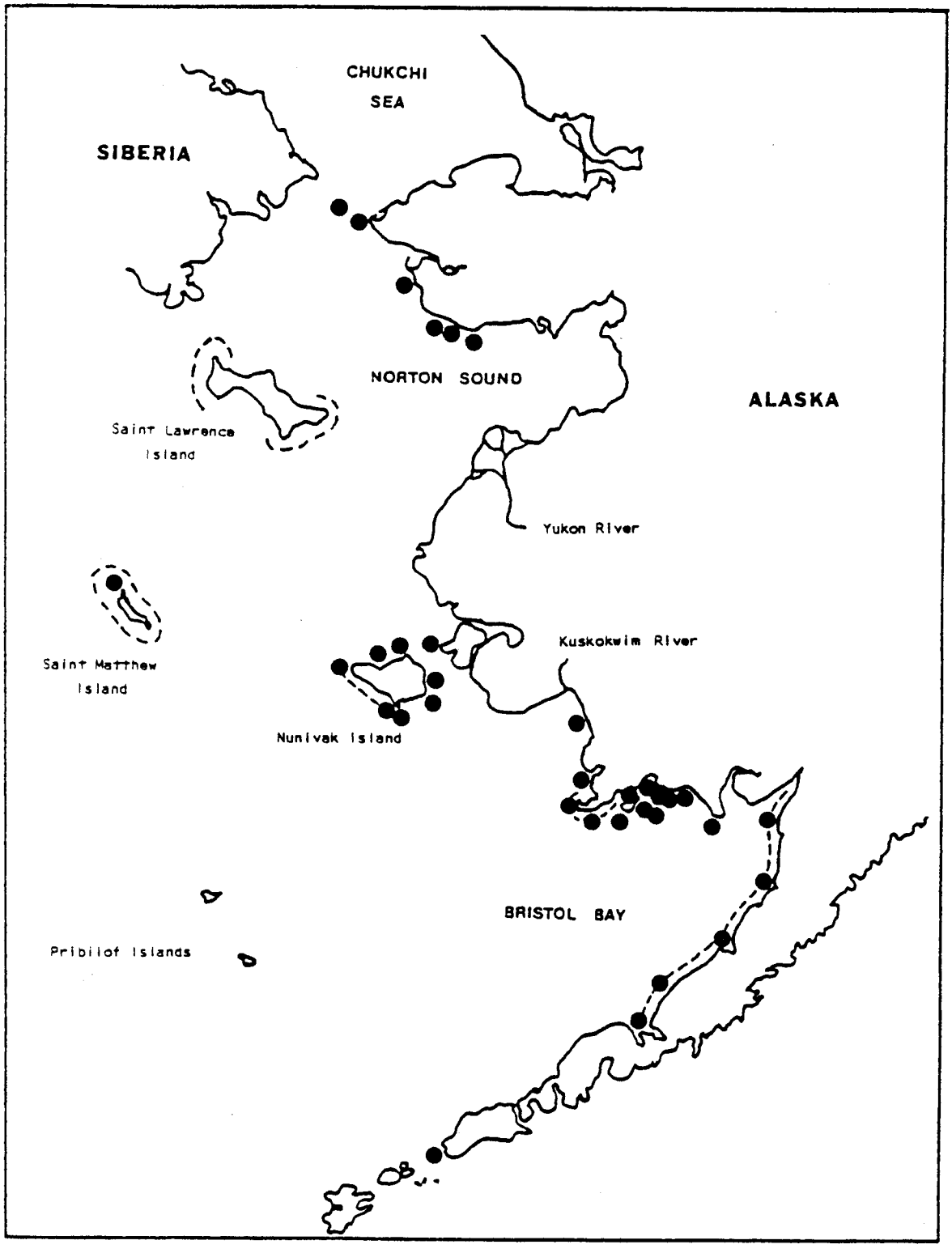

Figure 23. Map of the eastern Bering Sea showing locations where gray whales have been sighted.

Little is known about the route of gray whales on their southward migration. All except four of the sightings from the Alaska Peninsula (with the exception of Nelson Lagoon and Port Moller) Bristol Bay, and Nunivak Island were made in April through June. The remaining four were in early July. The migration through Unimak Pass takes place from October to early January, with the largest numbers passing through in late November and early December (Rugh and Braham 1979). The Bristol Bay coast has been flown repeatedly in autumn in conjunction with surveys for other species, and no whales have been seen. Fay and Lowry (1981) flew over 1,600 km of survey trackline in Bristol Bay monthly from September to November 1980 and January to March 1981. They saw one gray whale near Port Moller in December. The absence of coastal sightings at this time suggests that the whales travel farther offshore on their southward migration.

J. Sea Otter

Sea otters occur along the Alaska Peninsula from Unimak Island northeast to Port Heiden and occasionally as far as Ugashik and Egegik bays (Fig. 24). The area inside the 60-m contour from Cape Mordvinof to Cape Lieskof was classified as critical sea otter habitat by Schneider (1976, 1981). In the mid-1970's, otter range and numbers were somewhat reduced due to heavy ice years in 1971, 1972, and 1974, and most otters were found west of Cape Leontovich. Since 1976 the range has again gradually expanded, and, in 1982, sightings were made as far east as Port Heiden. However, all large sightings continue to be in the area from about Bechevin Bay to Moffet Point. In April 1982, the sea ice advanced south to Cape Kutuzof (just north of Port Moller), and there were reports of weak or dead otters from Port Heiden and Port Moller. Although on a much smaller scale than the die-offs of the early 1970's, repeated events such as these undoubtedly prevent long-term expansion of sea otter range past Port Heiden.

The highest density (3-6/km^2) areas for otters along the Alaska Peninsula are in water depths less than 40 m, although some otters (< 1/km^2) may be found in water as deep as 80 m (Schneider 1981). Females and pups prefer the shallower waters. Animals seen in deep water are more likely to be adult males. There may be considerable onshore-offshore movement, depending on weather conditions and sea state.

A few sea otters are also present in the Pribilof Islands. Some were transplanted there in the 1950's and 1960's, and some may have arrived there on their own. In the 1970's a few sightings of one to two otters, none with pups, were made around St. George, St. Paul, and Otter Islands. In summer 1982, three otters were seen near Dalnoi Point on St. George, and two of those were accompanied by pups.

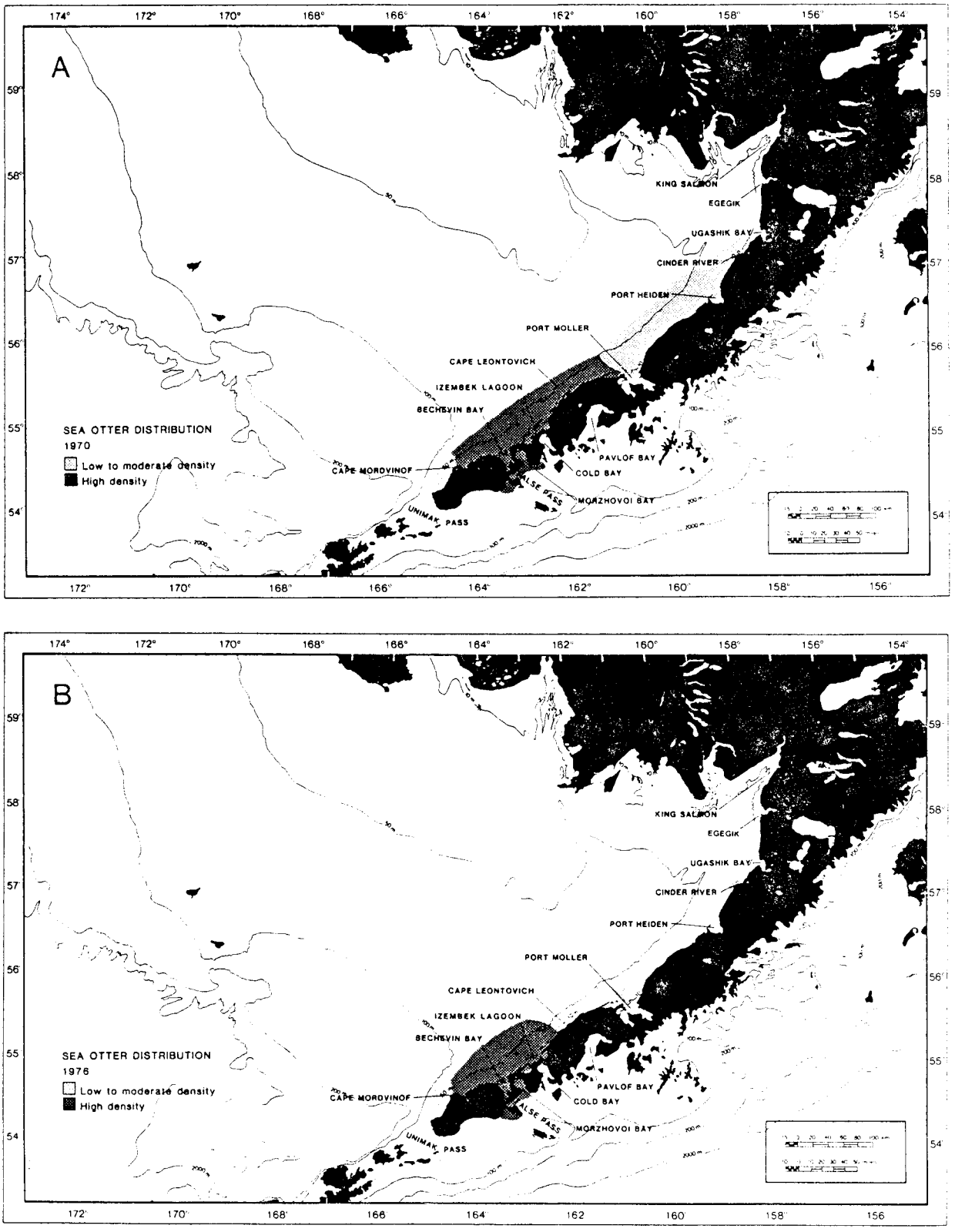

Figure 24. Distribution of sea otters north of the Alaska Peninsula and Unimak Island (a) in 1970 and (b) in 1976. Distribution in the early 1980's resembles that in 1970. (from Schneider 1981)

VIII. Conclusions

A. Adequacy of Sighting Data

The portion of the Alaska coastline included in this study is approximately 3,700 km in length, of which about 900 km are on offshore islands and the remainder on the mainland. This is obviously a very large area over which to document all localities used by marine mammals. However, most of this area can no longer be considered truly remote, and the combined observations of persons on shore, at sea, and in the air provide a wealth of information on where and when marine mammals occur. The inherent interest of local residents in the natural resources which surround them has been encouraged and supplemented by the work of biologists supported by OCSEAP, as well as other federal agencies, and the State of Alaska.

This has been the first comprehensive attempt to compile all existing data on coastal marine mammal distribution and abundance in the Bering Sea during the ice-free season. We generally did not attempt to collect new data nor did we have the funds necessary to interview coastal residents in the manner which would be necessary to maximize the value of existing local knowledge. Nonetheless, we have been very impressed by the amount of information which was available. Since much of the data available has been collected on an opportunistic basis, it is difficult to evaluate whether the composite picture derived from sightings accurately reflects the pattern of marine mammal distribution and abundance. In some cases such as on the north side of the Alaska Peninsula and Round Island, specific studies of marine mammals have been conducted. However, few such studies have been done on the offshore islands or along the mainland coast from northern Bristol Bay to Bering Strait. Since 1967, annual aerial surveys of herring spawning concentrations have been flown along most of the coast of the mainland and Nunivak Island in May and June. Large sections of the Yukon-Kuskokwim Delta have been annually surveyed since 1977, principally for seabirds. Sightings of marine mammals were routinely recorded on those surveys and are included in this report. In addition, much information has been collected by ADF&G area biologists and USFWS refuge managers throughout Alaskan waters but particularly in Bristol Bay, Norton Sound, and Bering Strait. We are confident that all major coastal areas utilized by marine mammals in summer and autumn have been identified in this report and that the data are adequate to describe, in a general sense, the use of various regions of the coast by marine mammals. This information should be of considerable value for planning and perhaps regulating the development of OCS hydrocarbon reserves. However, probably without exception, available data on the numbers, activities, and dynamics of marine mammals at specific locations are not sufficient to estimate total numbers of animals or to measure or monitor the impacts of OCS activities or other factors on them.

B. Importance of Coastal Regions to Marine Mammals

Marine mammals inhabit virtually the entire coastal zone of the eastern Bering Sea during summer and autumn. However, their distribution is far from uniform. The greatest concentration of marine mammals occurs in Bristol Bay, which is inhabited by 25-30,000 harbor seals; approximately 5,000 sea lions; perhaps 20,000 walruses; 1,000-1,500 belukhas; and about 17,000 sea otters. Sea lions are most abundant in rocky regions such as Amak Island and the western portion of the northern coast. Major concentrations of harbor seals occur along the northeastern portion of the Alaska Peninsula from Port Moller to Egegik. Sea otters are restricted to the southernmost portion of Bristol Bay, with the core of their range between Cape Mordvinof and Cape Lieskof. The largest walrus hauling area in Alaska is on Round Island in northwestern Bristol Bay; in recent years, substantial numbers of walruses have also hauled out at Cape Seniavin on the Alaska Peninsula. In Bristol Bay, belukhas are seen principally in Kvichak and Nushagak bays and their associated estuaries. Harbor porpoises, minke whales, and killer whales occur in the Bristol Bay area. Also, the majority of the gray whale population passes along the north side of the Alaska Peninsula and the north coast of Bristol Bay during its spring, northward migration.

Based on available sightings, it appears that fewer marine mammals utilize coastal regions of the mainland north of Bristol Bay. There are no major haulouts for sea lions or walruses, although substantial numbers of walruses occasionally haul out in Kuskokwim Bay and Norton Sound. Harbor and spotted seals haul out in large numbers on offshore bars in Kuskokwim Bay, and spotted seals regularly use several locations, particularly Golovnin Bay and Port Clarence. Belukhas are common off the mouths of the Yukon River but do not regularly utilize the bays along the Yukon-Kuskokwim Delta. They do regularly occur in Golovnin Bay and Norton Bay. Harbor porpoises are occasionally recorded along the coast, particularly in Norton Sound. Gray whales are only rarely seen along this portion of the mainland since their migration route appears to take them from Cape Newenham to Nunivak Island and then northward to St. Lawrence Island.

Offshore islands are also important marine mammal habitats, particularly for pinnipeds (Table 21). Sea lions regularly haul out on all of the Pribilof Islands, St. Matthew and nearby islands, and St. Lawrence Island. They are irregularly seen hauled out farther to the north. The only area presently used for breeding is Walrus Island in the Pribilofs. The major haulout for harbor seals is on Otter Island, where hundreds of animals including pups occur throughout the summer. Major areas for spotted seals are St. Matthew, Hall, and St. Lawrence islands. Major walrus haulouts occur on St. Lawrence Island, the Punuk Islands, and all islands north of there with the probable exception of Fairway Rock. Substantial numbers also use St. Matthew and Hall islands but not the Pribilof Islands.

Table 21. Maximum recorded numbers of pinnipeds hauled out on major offshore islands in the eastern Bering Sea, based on recent sightings.

	Sea lion	Harbor/ spotted seal	Walrus
St. George Island	3,000	small numbers	--
St. Paul Island	500	small numbers	--
Otter Island	1,000 males	1,300	1
Walrus Island	4-5,000 adults	--	1
Nunivak Island	< 100	100-200	--
St. Matthew Island	300	400-500	300
Hall Island	350	100	550
Pinnacle Island	150-200	--	--
St. Lawrence Island	1,000	hundreds	90,000
Punuk Islands	200	--	50-60,000
Sledge Island	irregular	irregular; small numbers	1,000
King Island	--	--	1,000
Fairway Rock	irregular	--	--
Diomede Islands	irregular	--	5-10,000

With the exception of gray whales which are seen occasionally near the Pribilofs and regularly near St. Lawrence Island, the distribution of cetaceans near offshore islands is poorly known. Belukha whales occur near Nunivak Island during ice-free months and are seen near St. Lawrence and Little Diomede islands during the spring and autumn migrations. Harbor porpoises and minke whales have been seen off the south and east sides of Nunivak Island, and minke whales are known to occur near St. Lawrence Island.

We have included killer whales and minke whales in this report since general information indicated that they are sometimes common in nearshore waters. The sightings we located have verified that minke whales regularly occur in coastal waters of the eastern Bering Sea. Fourteen sightings of minkes were recorded; four of those were off the north side of the Alaska Peninsula and five were near the mouth of Golovnin Bay. We located only one sighting of a single killer whale off Etolin Point (Nushagak Bay), although they are known to be present near Unimak Island. We conclude that killer whales are not a major component of the nearshore marine mammal fauna of the eastern Bering Sea.

C. Potential Effects of OCS Activities

The possible effects of OCS exploration and development in the Bering Sea are of two principal types: 1) those associated with hydrocarbons which are released into the environment, and 2) those related to disturbances which may affect the behavior and distribution of animals. Possible direct impacts of oil pollution have been discussed by Davis and Anderson (1976), Geraci and Smith (1976, 1977), Costa and Kooyman (1980), Geraci and St. Aubin (1980), and Cowles et al. (1981). Generally speaking, direct effects of oil are expected to be greatest on animals which rely on fur for insulation, which includes sea otters and the newborn young of ice-inhabiting seals. Effects of oil which may be ingested in the process of feeding or growing were discussed by Geraci and Smith (1976, 1977) and Cowles et al. (1981). Results available to date are inconclusive, although some physiological effects have been documented. Effects of oil on foods of Bering Sea marine mammals were discussed in detail in Lowry et al. (1981). In the remainder of this section we will discuss only the possible effects of disturbance on the abundance, distribution, and behavior of marine mammals in the coastal zone of the eastern Bering Sea.

There can be little question that air- and water-borne noise will in many cases be audible to marine mammals (e.g., see Myrberg 1978). The possible effects of such disturbances caused by noise or the physical presence of humans, vessels, or equipment are poorly known since very few studies have systematically addressed the question. Terhune et al. (1979) documented a decrease in vocalizations of harp seals (Phoca groenlandicus) in the presence of an operating vessel, which they attributed primarily to motor noise. It has been suggested

that an increase in "water tourism" has caused a decrease in abundance of harbor seals in the Netherlands (Bonner 1978). Disturbance by humans has caused an elevated mortality in recently born Hawaiian monk seals (Monachus schauinslandi) (Rice 1964) and reduced productivity of Mediterranean monk seals (Monachus monachus) (Sergeant et al. 1978). Salter (1979) has documented a number of behavioral responses of walruses to over-flying aircraft, and we have noted that seals, sea lions, and walruses almost invariably flee into the water when approached by humans or low-flying aircraft. Fay (pers. commun.) observed instances when walruses at Cape Seniavin were stampeded into the water by low-flying aircraft. When animals flee from the hauling areas, some mortality of animals, especially recently born young, will occur through injury or abandonment and subsequent starvation. The magnitude of this problem will vary by species, location, and time of year. In the case of walruses, regular human disturbance has prevented the long-term use of haulouts at Cape Newenham, Sledge Island, and to some extent King Island (ADF&G, unpubl.). Salter (1979) suggested that disturbances associated with the establishment of permanent bases in the Arctic may have caused changes in the summer distribution patterns of walruses.

Disturbance responses of cetaceans are more difficult to observe and quantify. Nishiwaki and Sasao (1977) believe that human activities, principally vessel traffic, have altered the migration routes of Baird's beaked whales (Berardius bairdii) and minke whales off the coast of Japan. In the case of minke whales, the greatest effect may have been on females with calves which avoided traditionally used coastal areas. Fraker (1977) discussed the effects of disturbance on belukha whales in the Mackenzie delta area. We have observed that outboard-powered boats affect belukha movements in rivers and bays. When a boat approached whales moving up the Snake River, they changed direction and moved downstream. When boats approached a large group of whales in shallow areas of western Nushagak Bay, they all turned and headed eastward toward deeper water. Changes in the summer distribution pattern of belukhas in Kotzebue Sound are closely correlated with changes in human activities and associated boat traffic (Burns et al., in prep.).

The actual results of responses to disturbances such as those discussed above are even less well known than the responses themselves. Mortality and injury of animals, particularly newborn or nursing young, will definitely occur in some circumstances, as has been documented for walruses and monk seals. More subtle effects on animal condition may also occur when disturbances interfere with normal activities such as nursing, resting, breeding, and molting. Perhaps most significant is the long-term displacement of animals that will be caused by continuous or regular and frequent disturbance. Since feeding is a major activity for marine mammals during summer and autumn, it is reasonable to assume that concentration areas of marine mammals occur in locations where they can obtain their food most efficiently. Pinnipeds require hauling areas on which to rest between feeding forays, and some species of cetaceans may likewise need protected areas in which to rest, care for

young, and socialize. These coastal concentration areas occur at specific locations and are limited in number. Displacement from these areas will mean that those feeding grounds are abandoned or that animals will have to travel greater distances to reach them from the nearest refuge, either of which would be detrimental in energetic terms. One might speculate that such displacement would have the greatest effect on a species such as walrus, which feed on sessile organisms that occur abundantly only in limited areas. However, the principal prey of many other species such as capelin, herring, and salmon are equally concentrated at specific areas and times of year. Changes in distribution and abundance which prevent a species from exploiting its potential food resources in the most efficient manner will result in long-term changes in productivity, survival, and abundance.

IX. Needs for Further Study

This study covered a large portion of the Alaska coastline and included many of the locations which are important marine mammal habitats during spring and autumn. A similar report which will deal with the Chukchi Sea coast is in preparation and will be submitted by the end of 1982. Many coastal areas of the Aleutian Islands and the Gulf of Alaska are also important habitat for marine mammals, particularly sea lions, sea otters, and harbor seals. A review of available data on distribution and abundance of marine mammals in the coastal zone would be very useful for planning OCS activities in those areas.

This report includes all sighting data available to us up to the end of 1981. Some significant observations made in summer 1982 are also included. Undoubtedly, we have missed some past observations which should have been included. In addition, with the present intensity of field research in western Alaska, much new information will be generated each year. We consider this report to be a working document which will be of greatest value if it can encourage researchers to record their sightings of marine mammals and make them available to others. A single sighting which seems of little value in itself may become of substantial significance when considered in combination with all the other data available. Consideration should be given to updating and revising this report on a regular basis, perhaps every 2 years.

Although we have been able to describe general features of the distribution and abundance of marine mammals in the coastal areas of the eastern Bering Sea using the existing data base, with few if any exceptions the available data are not adequate to predict or monitor the effects of OCS development or other human activities on marine mammals. With the exception of walruses on Round Island, there have been no systematic studies which have described the distribution, abundance, and activities of marine mammals at a particular location throughout the time they occur there and for a series of years. The available data show quite conclusively that the number of animals using

particular areas has changed over time, and we predict that such fluctuations will continue to occur during OCS exploration and development. Without some additional research on the biology of marine mammals in the coastal zone, it will be difficult to detect and measure the fluctuations and impossible to identify the causes.

We suggest that OCSEAP initiate studies that will deal with representative species and habitats in areas that are likely to be impacted by OCS activities in the near future. Some potential species and areas are as follows:

Steller sea lions - Amak Island, Walrus Island (Pribilof Islands)

Harbor seals - Otter Island

Spotted seals - Golovnin Bay, St. Matthew Island

Walruses - Cape Seniavin, Punuk Islands, Besboro Island

Belukha whales - Kvichak and Nushagak bays, Golovnin Bay

Gray whales - north side of the Alaska Peninsula, particularly Nelson Lagoon

Of principal interest at each location is documentation of the seasonal cycle in numbers of animals using the area. Activity patterns should be examined as they relate to enumeration of animals as well as for documentation of "normal" activity. Present levels of disturbance and their effects, if any, should be monitored. Information should be gathered on the relationships among groups of animals at various locations; i.e., what is the rate of interchange among areas and what degree of fidelity do individuals have to particular locations. Research should include observations of group composition, birth and survival rates, and present causes of mortality. Finally, the significance of the area to the animals should be determined; i.e., is it used principally for feeding, birthing, breeding, or some combination of purposes. If such studies are begun prior to OCS leasing and continued at intervals after exploration and development begin, it will be possible to make some definitive statements regarding the effects of OCS activities.

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APPENDIX I.

Geographical Coordinates of Locations Referred to in Text

Name	Region	Latitude	Longitude
Aghnaghak Lagoon	NB 4	63°40'N	171°33'W
Alakanuk	SMH 3	62°41'20"N	164°37'00"W
Amak Island	NAB 1	55°25'N	163°08'W
Anerkochik River	SMH 3	61°06'N	165°09'W
Applegate Cove	NAB 1	55°13'N	162°52'W
Baird Inlet	SMH 3	60°45'N	164°00'W
Bald Head	NB 1	64°45'N	161°32'W
Bear River	NAB 1	56°10'N	160°26'W
Bechevin Bay	NAB 1	55°00'N	163°23'W
Beeson Slough	NB 1	64°15'N	161°00'W
Besboro Island	NB 1	64°07'45"N	161°18'30"W
Big Creek (near Egegik)	NAB 2	58°17'25"N	157°32'30"W
Binajoaksmiut Bay	SMH 2	59°51'N	166°31'W
Bird Rock	NAB 4	58°40'N	162°08'W
Black River	SMH 3	62°21'N	165°20'W
Black Rock	NAB 4	58°42'30"N	160°11'45"W
Bluff	NB 2	64°34'N	163°45'W
Booshu Camp	NB 4	63°28'N	171°48'W
Brevig Mission	NB 3	65°20'N	166°29'W

Appendix I

Name	Region	Latitude	Longitude
Calm Point	NAB 4	58°35'N	161°05'W
Carolyn Island	NB 2	64°27'N	162°53'W
Carter Bay	SMH 1	59°19'N	161°59'W
Cathedral River	NAB 1	55°37'N	162°19'W
Chagvan Bay	SMH 1	58°46'N	161°46'W
Chibukak Point	NB 4	63°47'N	171°39'W
Chichigof, Cape	NAB 2	58°20'N	157°32'W
Chiukak	NB 2	64°31'N	163°22'W
Chunak Point	NAB 1	55°02'N	163°27'W
Cinder River	NAB 2	57°22'30"N	158°07'30"W
Clarence, Port	NB 6	65°12'N	166°45'W
Constantine, Cape	NAB 3	58°23'30"N	158°53'30"W
Crooked Island	NAB 4	58°40'N	160°15'W
Dalnoi Point	SGB 1	56°36'40"N	169°46'30"W
Darby, Cape	NB 1	64°19'N	162°47'W
Datheekook Point	SMH 2	60°04'20"N	167°20'00"W
Deadman Sands	NAB 3	58°42'N	157°27'W
Deer Island	NAB 1	55°55'N	160°50'W
Denbigh, Cape	NB 2	64°23'N	161°32'W
Dexter, Point	NB 1	64°32'N	161°23'W
Dillingham	NAB 3	59°02'30"N	158°27'30"W
Diomede Island, Little	NB 6	65°47'N	169°W
Divide, Point	NAB 1	55°53'N	160°47'W
Douglas, Cape	NB 2	65°00'N	166°42'W

Appendix I

Name	Region	Latitude	Longitude
Eagle Bay	NAB 4	58°47'N	159°49'W
Egegik	NAB 2	58°13'N	157°22'W
Egegik Bay	NAB 2	58°13'N	157°31'W
Egegik River	NAB 2	58°12'N	157°24'W
Egg Island	NB 1	63°36'30"N	161°44'15"W
Ekuk	NAB 3	58°49'00"N	158°33'30"W
Elephant Rock	SMH 4	60°42'N	173°03'W
Elim	NB 1	64°37'N	162°15'W
Emeghee Point	NB 4	62°58'N	169°46'W
Emmonak	SMH 3	62°46'35"N	164°31'40"W
Estus Point	NAB 4	58°47'N	161°12'W
Etolin, Cape	SMH 2	60°26'N	166°09'W
Etolin Point	NAB 3	58°37'N	158°15'W
Etolin Strait	SMH 2-3	60°00'N	165°00'W
Gambell	NB 4	63°47'N	171°45'W
Glazenap, Cape	NAB 1	55°15'N	163°00'W
Glory of Russia, Cape	SMH 4	60°36'N	172°57'W
Golovin	NB 2	64°33'N	163°02'W
Golovnin Bay	NB 2	64°24'N	163°00'W
Goodnews Bay	SMH 1	59°03'N	161°49'W
Grantley Harbor	NB 3	65°17'N	166°15'W
Greig, Cape	NAB 2	57°43'N	157°41'W

Appendix I

Name	Region	Latitude	Longitude
Hagemeister Island	NAB 3	58°39'N	160°54'W
Hall Island	SMH 4	60°40'N	173°06'W
Hastings Creek	NB 2	64°32'N	165°06'W
Hazen Bay	SMH 2	61°01'N	165°20'W
Heiden, Port	NAB 2	56°54'N	158°48'W
Herendeen Bay	NAB 1	55°50'N	160°50'W
High Island	NAB 4	58°43'N	160°25'W
Hook Lagoon	NAB 2	57°17'N	158°20'W
Hooper Bay	SMH 3	61°27'N	166°00'W
Igushik	NAB 3	58°42'N	158°53'W
Ikook Point	SMH 2	60°12'50"N	167°27'30"W
Ikookstakswak Cove	SMH 2	60°13'30"N	167°20'00"W
Ilnik	NAB 2	56°36'N	159°37'W
Inglutalik River	NB 1	64°50'N	160°54'W
Isanotski Islands	NAB 1	55°00'N	163°19'W
Isanotski Strait	NAB 1	54°49'N	163°23'W
Izembek Lagoon	NAB 1	55°20'N	162°48'W
Jacksmith Bay	SMH 1	59°30'N	161°45'W
Johnson Hill	NAB 3	58°35'40"N	157°14'00"W
Kenmore Head	NAB 1	54°56'40"N	163°01'40"W
Kialegak Point	NB 4	62°59'N	169°32'W
Kigoumiut Bay	SMH 2	60°13'50"N	167°07'00"W

Appendix I

Name	Region	Latitude	Longitude
King Island	NB 5	64°58'N	168°05'W
King Salmon	NAB 3	58°41'30"N	156°39'30"W
Kipnuk	SMH 2	59°56'N	164°03'W
Klikitarik	NB 1	63°28'N	161°28'W
Kongiganak	SMH 1	59°52'N	163°02'W
Kongkok Bay	NB 4	63°23'N	171°47'W
Kookoolik Cape	NB 4	63°42'N	170°21'W
Koozata Lagoon	NB 4	63°21'N	170°39'W
Koyuk	NB 1	64°56'N	161°09'W
Krenitzin, Cape	NAB 1	55°04'N	163°25'W
Kulukak Bay	NAB 4	58°49'N	159°44'W
Kulukak Point	NAB 4	58°50'N	159°39'W
Kvichak Bay	NAB 3	58°26'N	157°54'W
Kvichak River	NAB 3	58°52'N	157°03'W
Kwigillingok	SMH 1	59°51'N	163°08'W
Lapin, Cape	NAB 1	54°58'N	164°07'W
Leontovich, Cape	NAB 1	55°40'N	162°16'W
Lieskof, Cape	NAB 1	55°47'N	162°05'W
Little Cape Corwin	SMH 2	60°01'N	165°38'W
Lost River	NB 3	65°23'N	167°09'W
Lunda Bay	SMH 4	60°17'N	172°26'W
Lunda Point	SMH 4	60°17'N	172°25'W

Appendix I

Name	Region	Latitude	Longitude
Maknek River	NB 4	63°08'N	169°24'W
Maknik Lagoon	NB 4	63°11'N	169°15'W
Malikfik River	NB 1	64°24'N	161°17'W
Mekoryuk	SMH 2	60°23'20"N	166°11'00"W
Mekoryuk River	SMH 2	60°23'N	166°11'W
Mendenhall, Cape	SMH 2	59°45'N	166°10'W
Metervik Bay	NAB 4	58°49'N	159°46'W
Mikisagimiut	SMH 2	60°13'15"N	167°16'30"W
Moffet Lagoon	NAB 1	55°24'N	162°35'W
Moffet Point	NAB 1	55°27'20"N	162°32'00"W
Mohican, Cape	SMH 2	60°12'N	167°25'W
Moller, Port	NAB 2	55°53'N	160°28'W
Mordvinof, Cape	NAB 1	54°56'N	164°26'W
Moses Point	NB 1	60°45'30"N	161°45'00"W
Nabangoyak Rock	SMH 2	60°08'N	167°21'W
Nakeen	NAB 3	58°46'N	157°02'W
Naknek	NAB 3	58°43'40"N	157°00'45"W
Naknek River	NAB 3	58°43'N	157°04'W
Nanvak Bay	NAB 4	58°35'N	161°45'W
Nash Harbor	SMH 2	60°15'N	166°52'W
Nelson Lagoon	NAB 1	56°00'N	161°00'W
Neumann Island	NAB 1	55°26'00"N	162°36'30"W
Newenham, Cape	NAB 4	58°39'00"N	162°10'30"W
Nome	NB 2	64°30'N	165°25'W

Appendix I

Name	Region	Latitude	Longitude
Nome, Cape	NB 2	64°26'N	165°00'W
Norma Bay	NAB 1	55°12'N	163°02'W
North Cove	SMH 4	60°40'N	173°05'W
North Creek	NAB 1	54°54'23"N	163°59'00"W
Northeast Cape	NB 4	63°18'N	168°42'W
Northeast Point	SGB 1	57°14'50"N	170°05'50"W
Norton Bay	NB 1	64°30'N	162°00'W
Nunivak Island	SMH 2	60°00'N	166°00'W
Nushagak Bay	NAB 3	58°30'N	158°30'W
Nushagak Peninsula	NAB 3	58°39'N	159°03'W
Nushagak River	NAB 3	59°03'N	158°23'W
Oksenof Point	NAB 1	54°53'N	164°33'W
Operl Island	NAB 1	55°23'N	162°46'W
Otter Island	SGB 1	57°02'45"N	170°24'00"W
Otter Point	NAB 1	55°03'N	163°47'W
Pastol Bay	NB 1	63°12'N	163°15'W
Pastolik River	SMH 3	63°02'N	163°20'W
Peirce, Cape	NAB 4	58°33'15"N	161°46'00"W
Penny River	NB 2	64°32'N	165°45'W
Pilot Point	NAB 2	57°33'50"N	157°34'45"W
Pinnacle Island	SMH 4	60°12'N	172°46'W
Platinum	SMH 1	59°00'45"N	161°49'00"W
Powooiliak Camp	NB 4	63°22'N	171°17'W

Appendix I

Name	Region	Latitude	Longitude
Pribilof Islands	SGB 1	57°N	170°W
Protection Point	NAB 3	58°29'30"N	158°41'45"W
Punuk Islands	NB 4	63°05'N	168°49'W
Quinhagak	SMH 1	59°45'N	161°54'W
Red Bluffs	SGB 1	56°32'20"N	169°38'00"W
Red Mountain	NAB 4	58°57'15"N	161°44'30"W
Reindeer Cove	NB 1	64°31'N	161°10'W
Right Hand Point	NAB 4	58°46'10"N	159°54'00"W
Rocky Point	NAB 1	54°56'30"N	163°26'30"W
Rocky Point	NB 2	64°24'N	163°08'W
Rodney, Cape	NB 2	64°39'N	165°24'W
Romanzof, Cape	SMH 3	61°49'N	166°06'W
Round Island	NAB 4	58°36'N	159°58'W
Safety Sound	NB 2	64°29'N	164°45'W
Saint George Island	SGB 1	56°35'N	169°35'W
Saint Lawrence Island	NB 4	63°30'N	170°30'W
Saint Lawrence Island, NE of	NB 4	63°46' to 64°02'N	167°44' to 168°51'W
Saint Matthew Island	SMH 4	60°24'N	172°42'W
Saint Michael	NB 1	63°29'N	162°02'W
Saint Michael Bay	NB 1	63°27'N	162°00'W
Saint Paul Island	SGB 1	57°10'N	170°15'W

Appendix I

Name	Region	Latitude	Longitude
Salghat Beach	NB 4	63°20'N	169°12'W
Sarichef, Cape	NAB 1	54°35'50"N	164°55'30"W
Sarichef Strait	SMH 4	60°37'N	173°00'W
Savoonga	NB 4	63°42'N	170°29'W
Scammon Bay	SMH 3	61°55'N	165°50'W
Sea Lion Point	NAB 1	54°34'N	164°56'W
Sea Lion Rock	SGB 1	57°06'15"N	170°17'30"W
Sea Lion Rocks	NAB 1	55°27'40"N	163°12'00"W
Seal Islands	NAB 2	56°42'N	159°21'W
Security Cove	NAB 4	58°41'30"N	161°54'00"W
Sekinak Lagoon	NB 4	63°05'N	169°48'W
Seniavin, Cape	NAB 1	56°24'N	160°09'W
Sennet Point	NAB 1	54°29'N	164°54'W
Sevuokuk Mountain	NB 4	63°46'N	171°42'W
Shaiak Island	NAB 4	58°33'30"N	161°40'00"W
Shaktoolik	NB 1	64°20'N	161°09'W
Shaktoolik River	NB 1	64°22'N	161°11'W
Siknik	NB 4	63°11'N	170°18'W
Sineak	NB 1	64°25'N	161°24'W
Sinuk River	NB 2	64°35'N	166°15'W
Sledge Island	NB 2	64°29'N	166°13'W
Snake River	NB 2	64°30'N	165°25'W
Snake River	NAB 3	58°52'N	158°45'W
Southeast Cape	NB 4	62°56'10'N	169°39'00"W
Southwest Cape	NB 4	63°19'N	171°27'W

Appendix I

Name	Region	Latitude	Longitude
Spencer, Point	NB 3	65°17'N	166°50'W
Stebbins	NB 1	63°31'20"N	162°17'20"W
Stephens, Cape	NB 1	63°32'30"N	162°18'40"W
Stolbi Rocks	NB 4	63°38'N	170°06'W
Strogonof Point	NAB 1	56°50'N	158°52'W
Stuart Island	NB 1	63°35'N	162°30'W
Summit Island	NAB 4	58°50'N	160°12'W
Swanson Lagoon	NAB 1	55°02'N	163°36'W
Tanunak	SMH 3	60°37'N	165°15'W
Taphook Point	NB 4	63°37'N	171°15'W
Teller	NB 3	65°16'N	166°22'W
Togiak Bay	NAB 4	58°51'N	160°30'W
Toksook Bay	SMH 3	60°31'45"N	165°06'00"W
Toksook River	SMH 3	60°30'N	165°00'W
Tolstoi Point	SGB 1	56°35'40"N	169°28'00"W
Tongue Point	NAB 4	58°49'N	160°50'W
Topkok Head	NB 2	64°33'N	163°58'W
Tvativak Bay	NAB 4	58°50'N	159°33'W
Twins, The	NAB 4	58°35'N	160°18'W
Ugashik Bay	NAB 2	57°35'N	157°42'W
Ugashik River	NAB 2	57°30'N	157°37'W
Unalakleet	NB 1	63°52'N	160°47'W
Unimak Island	NAB 1	54°45'N	165°00'W

Appendix I

Name	Region	Latitude	Longitude
Upright, Cape	SMH 4	60°19'N	172°15'W
Urilia Bay	NAB 1	54°55'N	164°18'W
Vancouver, Cape	SMH 3	60°33'N	165°25'W
Wagon Box Creek	NB 1	63°29'N	161°15'W
Walrus Cove	SMH 4	60°20'N	172°20'W
Walrus Island	SGB 1	57°11'N	169°56'W
Walrus Islands	NAB 4	58°43'N	160°15'W
Wood Point	NB 1	63°28'N	161°40'W
Wood River	NAB 3	59°03'N	158°25'W
Woolley, Cape	NB 2	64°48'N	166°28'W
Yukon River mouths	SMH 3	62°32'N	163°54'W

Appendix II.

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Amatoolik, D. - NB 2
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Anayah, T. - NB 6
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Antoghame, T. - NB 4
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Arneson, P. - NAB 4
seabird observer, Seabird Colony Status Program, USFWS (U.S. Fish and Wildlife Service), Anchorage

Arvey, W. - NAB 4, SMH 1, SMH 3
field report 1973; ADF&G, Commercial Fish Division, Anchorage

Aumiller, L. - NAB 4
ADF&G seasonal employee

Barton, L. - NAB 3, NAB 4, NB 1, NB 2
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Baxter, R. - NAB 3, NAB 4, SMH 1, SMH 2, SMH 3
aerial surveys for herring; ADF&G, Commercial Fish Division, Bethel

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Benson, J. - SGB 1
seabird observer, Seabird Colony Status Program, USFWS, Anchorage

Bill, D. - NAB 3
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Braham, H. - NAB 4
National Marine Mammal Laboratory, Seattle

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Brink, K. - SGB 1
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Brooks, J. - NAB 3, NAB 4
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Burns, J. - NAB 1, NAB 2, NAB 4, SGB 1, SMH 2, SMH 3, SMH 4, NB 1, NB 2, NB 3, NB 4, NB 6

ADF&G, Nome, 1962-69; Fairbanks, 1969-present, Marine Mammal Research Coordinator

Burns, J. - NAB 1, NAB 2
RESOLUTION cruise

Burns 1965 - NAB 3, NB 1, NB 4

Burns, J., Jr. - SMH 3
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Byrd, V. - NAB 1
seabird observer, Seabird Colony Status Program, USFWS, Anchorage

Calkins, D. - NAB 3, NAB 4, SMH 1
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Appendix II

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Dau, C. - NAB 1
Refuge Manager, Izembek NWR, Cold Bay

Degange, A. - SMH 2
seabird observer, Seabird Colony Status Program, USFWS, Anchorage

Dick, M. - NAB 1, NAB 2, NAB 4
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Dinneford, B. - NAB 4, SMH 3
ADF&G, Game Division, Bethel

Dittmer, J. - NAB 4
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Divoky, G. - NAB 1
seabird observer, Seabird Colony Status Program, USFWS, Anchorage

Drew, J. - NAB 3
pers. commun. to C. Smith

Drury, W. - NB 1, NB 2
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Faro, J. - NAB 2, NAB 4
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Fay, F. - NAB 4, NB 4
walrus researcher, Institute Marine Science, Univ. Alaska, Fairbanks

Fay, F. - NAB 1, NAB 2
RESOLUTION cruise

Fay 1957 - NAB 4

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Foster, W. - NB 3
commercial pilot, Foster Aviation, Nome

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Gill, R. - NAB 1, NAB 2, NAB 3, NAB 4, SMH 3
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Goro, F. - NAB 4
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Hood, L. - NAB 1
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Hotchkiss, L. - NAB 3, NAB 4
Assistant Refuge Manager, Togiak NWR

Hunt, C. - SMH 3
Kotlik resident, Native Liaison, Yukon Delta NWR

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Kelly, B. - NAB 4, SGB 1, NB 4
ADF&G; Institute Marine Science, Univ. Alaska, Fairbanks

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Appendix II

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King, R. - NAB 1, NAB 4
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Koozuna, J. - NB 5
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Kulukhon, L. - NB 4
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seabird observer, Seabird Colony Status Program, USFWS, Anchorage

Melchior, H. - NB 2
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Muktoyuk, E. - NB 3, NB 5
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Ponaganuk, T. - SMH 3
Hooper Bay resident

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Randall, R. - NAB 3
ADF&G seasonal employee

Ray, G. - NAB 1, NAB 4
Univ. Virginia, Charlottesville

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Reynolds, S. - NAB 1
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Refuge Manager, Izembek NWR

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Schneider, K. - NAB 1
ADF&G, Game Division, Research Coordinator-Marine Mammals, Anchorage

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Schwarz, L. - NB 1
aerial surveys for herring; ADF&G, Commercial Fish Division, Nome

Seaman, G. - NB 1, NB 2, NB 3
ADF&G seasonal employee (marine mammals)

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Searing, G. - NB 4
seabird observer, Seabird Colony Status Program, USFWS, Anchorage

Sellers, R. - NAB 1
ADF&G, Game Division, King Salmon

Seybert, O. - NAB 2
President, Peninsula Airways, King Salmon

Sholes, W. - NAB 4
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Siwooko, V. - NB 4
pers. commun. to F. H. Fay, Univ. Alaska, Fairbanks, and J. J. Burns, ADF&G, Fairbanks; Gambell resident

Smith, C. - NAB 1, NAB 2, NAB 3
ADF&G, Game Division, King Salmon

Smith, M. - SMH 3
Assistant Manager, Yukon Delta NWR

Smith, T. - SMH 2
ADF&G, Game Division, Nome

Sowls, A. - SMH 4
seabird observer and coordinator, Seabird Colony Status Program, USFWS, Anchorage

Steele, L. - NAB 1
Fish and Wildlife Protection Division, Alaska Department of Public Safety

Steen, N. - NAB 3
ADF&G, Game Division, King Salmon

Stephenson, R. - NB 4
ADF&G, Game Division, Fairbanks

Strickland, D. - NB 6
ADF&G seasonal employee

Strode, J. - NAB 4
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from Diomede, Wales, Nome, Gambell, and Savoonga

USFWS Walrus Survey - NAB 4, SMH 2, SMH 4
aerial survey 22-23 September 1980; flew from Barrow to Nome along coast, south side of St. Lawrence Is., and St. Matthew Is., north side of Nunivak Is., then Toksook Bay to King Salmon along coast

Vania, J. - NAB 4
ADF&G, Game Division, Anchorage

Ward, M. - SMH 4
St. Matthew Island field party, summer 1982, USFWS, Anchorage

Whitaker, N. - NB 6
from files of F. H. Fay, Univ. Alaska, Fairbanks

Wilkalkia, H. - NB 2
pers. commun. to R. Nelson, ADF&G, Nome; resident of Norton Sound area, Nome and Cape Nome, for 35+ years

Williamson, F. - NAB 4
from files of F. H. Fay, Univ. Alaska, Fairbanks

Appendix II

Winjum, J. - NAB 3
from files of C. Smith

Wolfe 1981 - SMH 3, NB 1