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Census of northern sea lion (*Eumetopias jubatus*) in central Aleutian Islands, Alaska, 17 June-15 July 1979

With notes on other marine
mammals and birds

by
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and
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ABSTRACT

A summary of a survey of northern sea lion (Eumetopias jubatus) in the central Aleutian Islands, Alaska, from 17 June to 15 July 1979 is presented. Counts were made from a ship and rafts by two or more observers using 7x50 binoculars, often with a viewing distance of 200 m or less. Photographs were taken at most rookery and haul sites and were used to calibrate the infield counts.

During the 29 days of the study, 68 central Aleutian Islands or islets were visited and the island coverage averaged 81%.

A total of 46,359 sea lions (including 2,431 bulls and 5,417 pups) were counted. A summary count for the entire Aleutian Islands from the present study and other recent surveys is 89,113. The locations of major sea lion rookeries across the Aleutian Islands suggest a uniform distribution although counts of pups and adults show greater densities of sea lions in the far east and far west.

The number of sea lions in the central and western Aleutians has not markedly changed over the past 20 years, but there has been a significant decline in the eastern Aleutians. A shift in distribution from east to west has probably not occurred and the decline in the eastern Aleutians is caused by other factors.

Counts of other marine mammals from the present survey include: 3,170 sea otter (Enhydra lutris) (including 279 pups), 674 harbor seal (Phoca vitulina richardii) (including 15 pups), 7 northern fur seal (Callorhinus ursinus), 43 minke whale (Balaenoptera acutorostrata), 1 fin whale (Balaenoptera physalus), 3 other rorquals, 63 killer whale (Orcinus orca), 16 harbor porpoise (Phocoena phocoena), 470 Dali's porpoise (Phocoenoides dalli), 54 beaked whales, plus 7 unidentified whales.

INTRODUCTION

Increasing concern for the marine resources of the Alaskan coastal regions as related to both domestic and foreign fisheries and the search for oil have brought about a massive research effort funded by the Bureau of Land Management called the Outer Continental Shelf Environmental Assessment Program. The distribution and abundance of marine mammals form an important part of this program. As a part of this study, biologists of the Alaska Department of Fish and Game (ADF&G) and the National Marine Fisheries Service (NMFS) have carried out surveys since 1975 to determine the seasonal distribution and abundance of northern sea lion (Eumetopias jubatus). These surveys have included offshore waters from the Gulf of Alaska to the Bering Sea as well as rookery and haul sites along the Alaska Peninsula, the eastern Aleutian Islands, and islands in the Bering Sea (Braham et al. 1977).

During the eastern Aleutian Islands surveys of 1975-77, it became apparent that there was a decline in numbers of sea lions during the past twenty years (Braham et al. 1980). However, biologists of the ADF&G found that sea lion populations were stable from the Shumagin Islands across the Gulf of Alaska to Forester Island (D. Calkins and K. Pitcher pers. commun.) The condition of the population in the central and western Aleutian Islands has remained largely unknown because no census of these regions has been made since 1959-60 (Kenyon and Rice 1961; Kenyon 1962) and 1965 (Kenyon and King 1965). Reports of counts from the western Aleutians by personnel of the Aleutian Islands National Wildlife Refuge (AINWR) of the U.S. Fish and Wildlife Service and a survey of a few of the islands in 1968 (Fiscus and Johnson 1968) indicated a possible increase in sea lion numbers on the western islands.

Because of the apparent decline in the eastern Aleutian Islands, coupled with the lack of recent observations of most islands west of the Fox Islands, there was a definite management need to survey the relative distribution and abundance of sea lions, in the central and western Aleutian Islands. Such a survey, reported here, was carried out by the National Marine Mammal Laboratory (NMML), NWAFC, NMFS from 17 June to 15 July 1979. This period corresponds with the sea lion breeding season when maximum numbers are hauled out (Braham et al. 1980).

The primary objective of the survey was to census sea lion breeding rookeries and haul sites and to produce a population estimate. Secondly, observations of other marine mammals and birds were to be recorded and described. However, because hauled out sea lions are easier to spot than other marine mammals, a search for sea lions is likely to produce low counts of sea otter (Enhydra lutris) and harbor seal (Phoca vitulina richardii).

Surveys directed toward sea otter population assessments are considered adequate for sea lion counts when the latter are included in the data. Marine mammal studies conducted in the Aleutian Islands prior to the present survey were primarily for sea otters. In 1959, 1960,

and 1965, aerial surveys were carried out in a DC-3 aircraft (Kenyon and Rice 1961; Kenyon and King 1965). Although these flights were scheduled early in the season (from March to May) to avoid the prevailing summer fog, they were still subject to delays, and some of the area was missed because of weather. Mathisen and Lopp (1963) also made aerial surveys as did Braham et al. (1980), with sea lions as their primary study species. Abegglen (1977) performed surveys from a small boat; Fiscus and Johnson (1968) used a boat and made counts from land.

METHODS

Because the eastern Aleutian Islands had been thoroughly surveyed as far west as Samalga during 1975-77 (Braham et al. 1980), and the Near Islands were being examined in June and July 1979 by personnel of AINWR, only islands between these extremes were surveyed by us. Therefore from 17 June to 15 July 1979 we searched the shorelines of most of the Aleutian Islands from the Islands of Four Mountains in the east to the Rat Islands in the west (Figs. 1-5). By relying on records of past surveys, virtually every significant known haul site was visited. Due to fog, tide rips, dense kelp beds, and limitations of time, parts of many islands were not examined, but these were generally not areas where sea lions were likely to haul out, such as in deep bays or fjords. Our counts represent a minimum estimate for the population at each location because they do not account for animals at sea nor for the daily turnover rate at each site, which can be considerable.

Optimal conditions for counting hauled out sea lions are during cool, overcast days; the best time is between 11 AM and 4 PM since approximately 90% of those that will haul out have done so by 10-11 AM (Kenyon and Rice 1961; Braham et al. 1980; D. Withrow pers. commun.). The worst environmental conditions which interfere with a count are: (1) during warm weather when the animals (especially females and pups) tend to concentrate near the water to thermoregulate (Gentry 1973), (2) on bright days when glare impairs vision; and (3) during storms when most animals remain in the water (Kenyon and Rice 1961; Mathisen and Lopp 1963). Most counts for this study were made during cool, overcast conditions.

Because fog shrouds these islands during June and July, surveys from a ship with the assistance of inflatable, motorized rafts were deemed more likely to succeed than would aerial surveys. A 33 m fishing vessel, the M/V Bering Star (Fig. 6), was chartered for 30 days. Two 4.7 m rafts were supplied by the NMML (Fig. 7). A crane on board the ship made possible convenient launching-of the rafts.

During daylight hours, while the ship was underway, at least two observers were on the bridge standing watch for marine mammals. With each sighting, the count, species, direction of travel, and behavior were noted with detailed descriptions including photographs when feasible. Some bird observations were recorded and are reported in Appendix VI. The eye level of an observer on the bridge was approximately 5 m above the waterline.

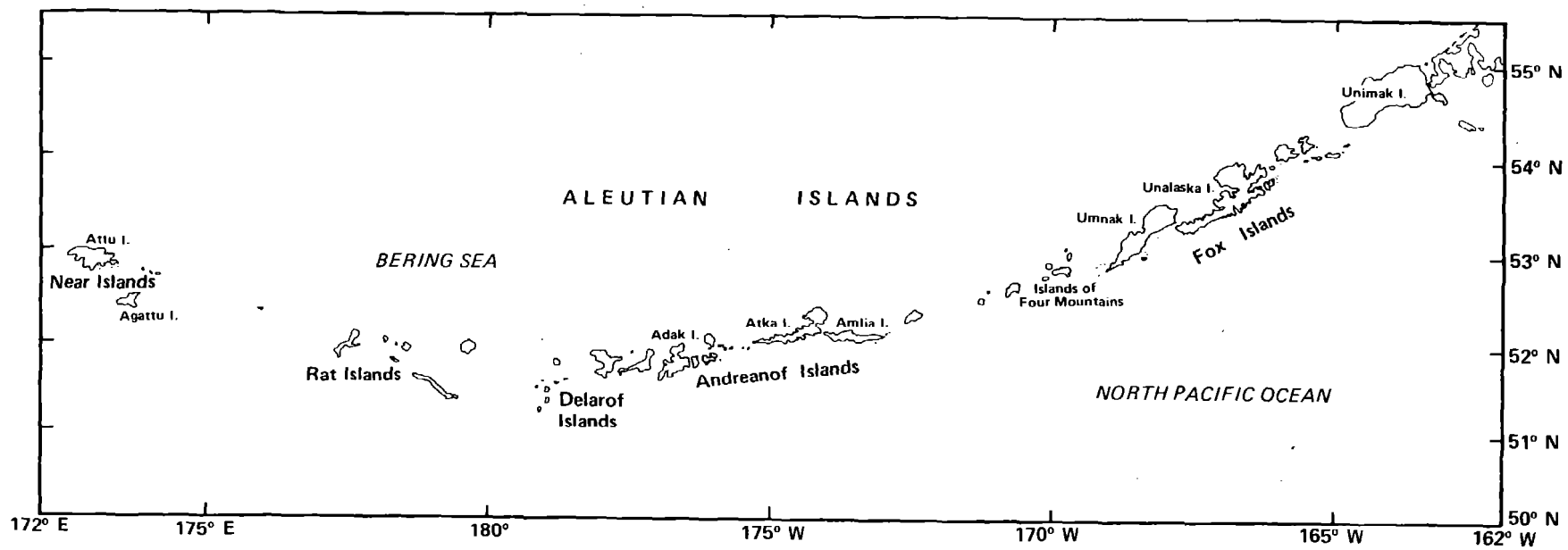


Figure 1. The Aleutian Islands, Alaska.

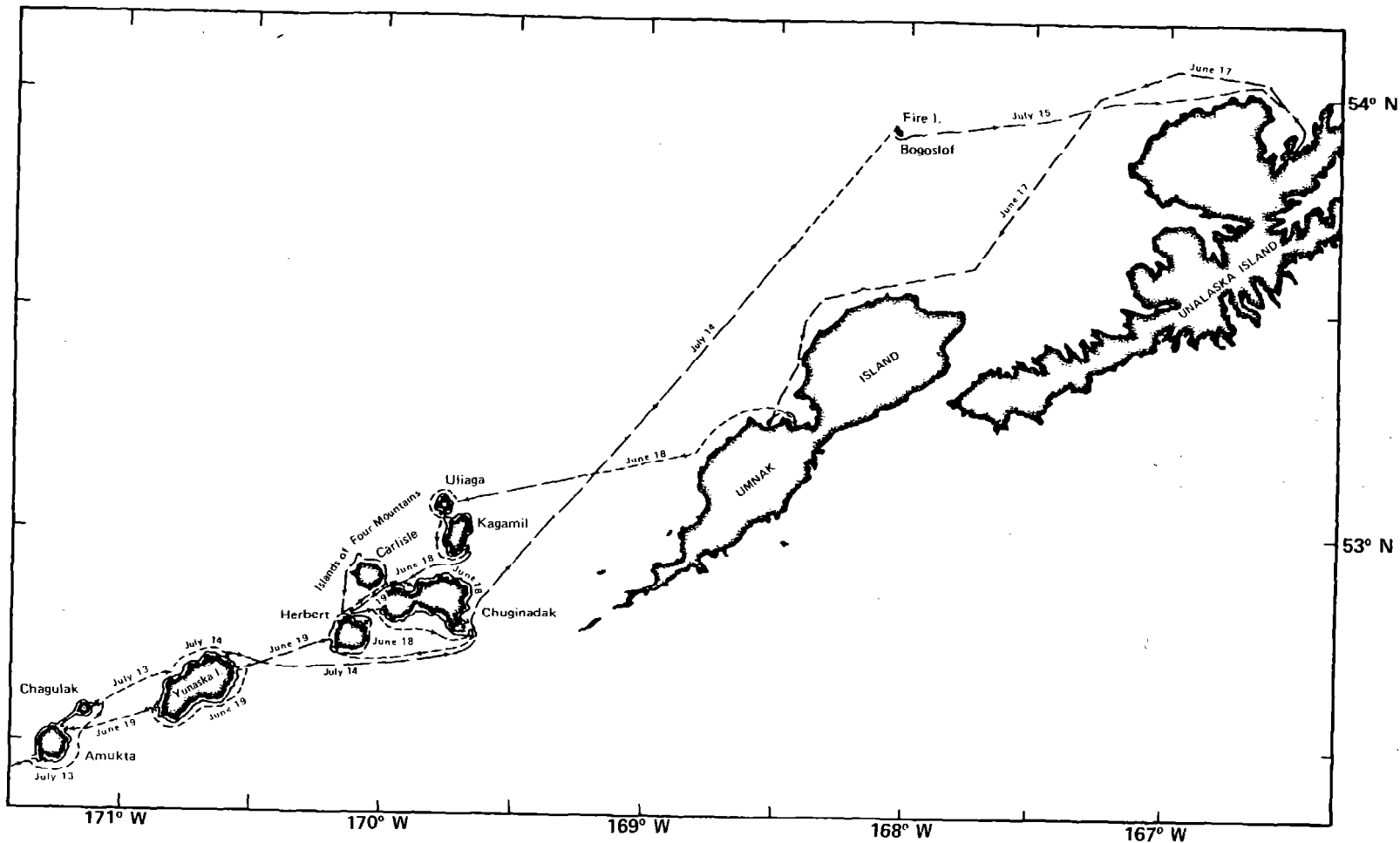


Figure 2. Survey tracklines made between Dutch Harbor, Unalaska I. and Amukta I. 17 June - 15 July 1979. Long dashed lines indicate tracks made during the night or in fog; short dashes represent surveys from the 33 m ship; solid tracklines represent surveys made from 4.5 m rafts.

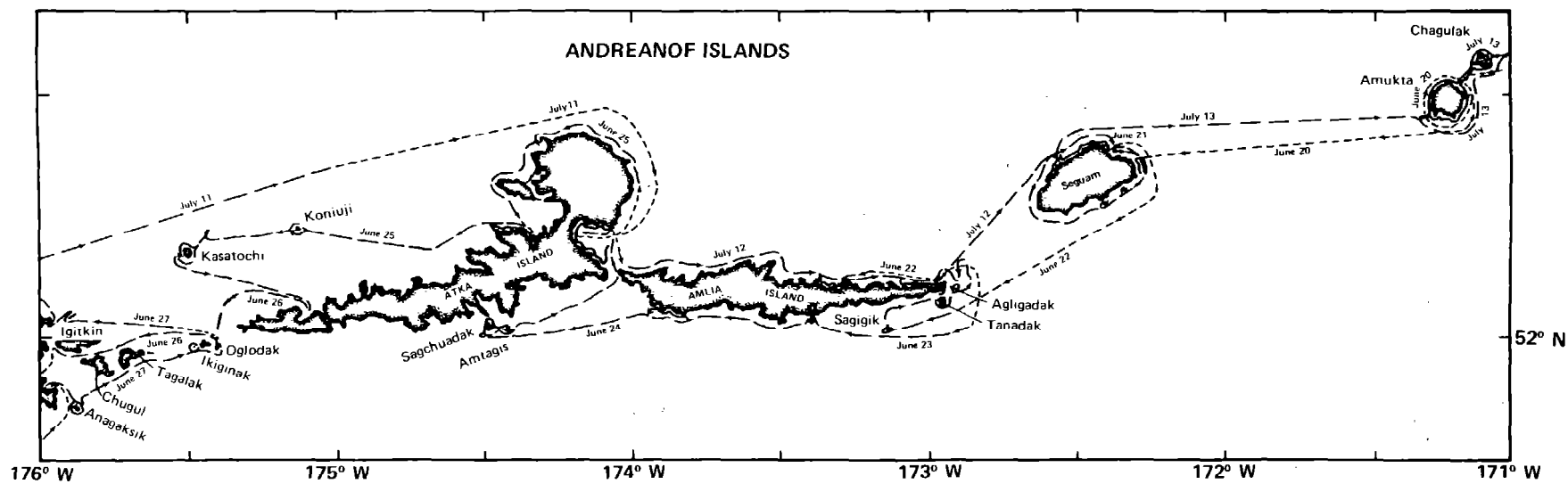


Figure 3. Survey tracklines made between Amukta I. and Igitkin I. Long dashed lines indicate tracks made during the night or in fog; short dashes represent surveys from the 33 m ship; solid tracklines represent surveys made from 4.5 m rafts.

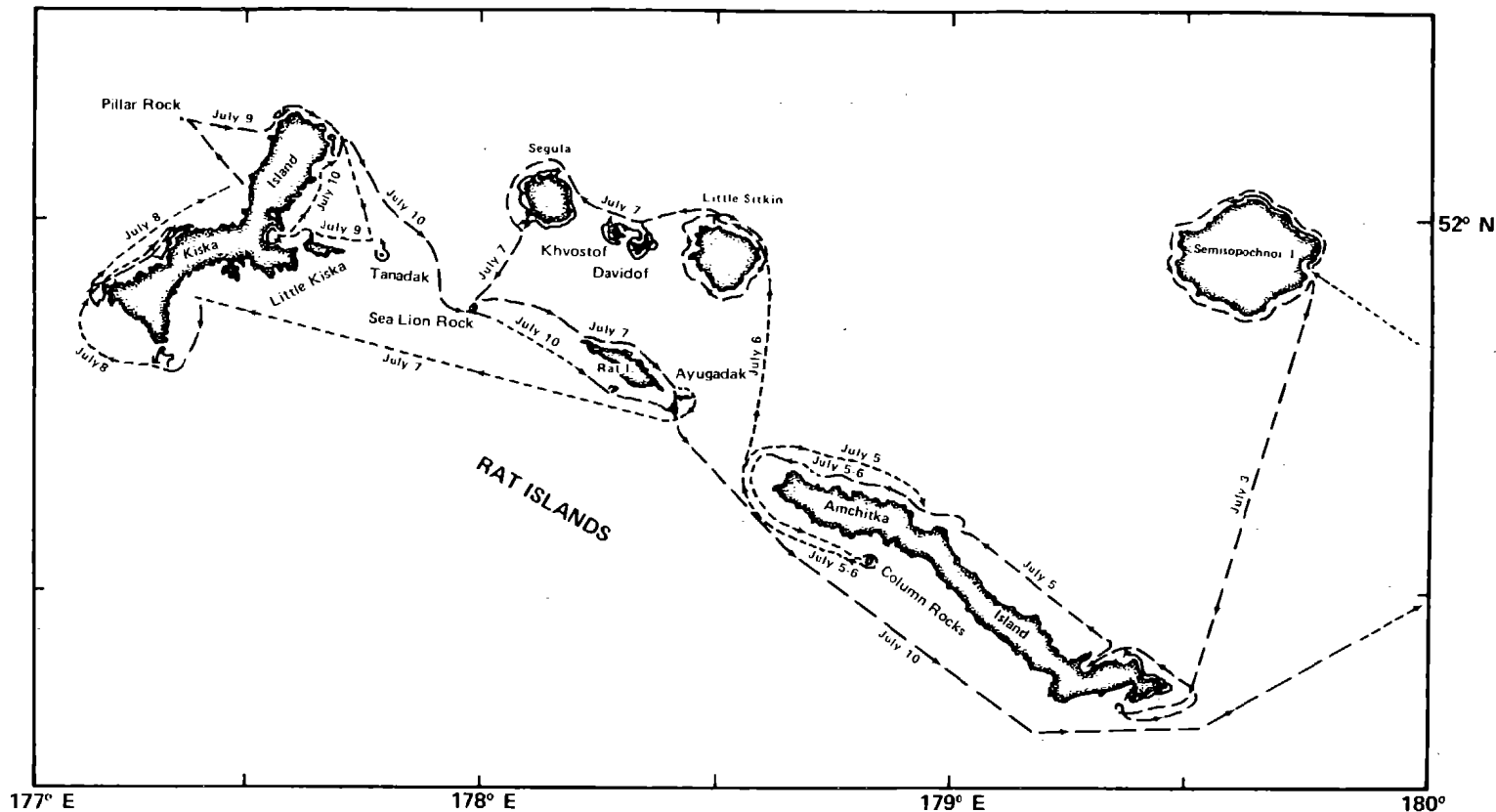


Figure 4. Survey tracklines made between Igitkin I. and Semisopchnoi I. Long dashed lines indicate tracks made during the night or in fog; short dashes represent surveys from the 33 m ship; solid tracklines represent surveys made from 4.5 m rafts.

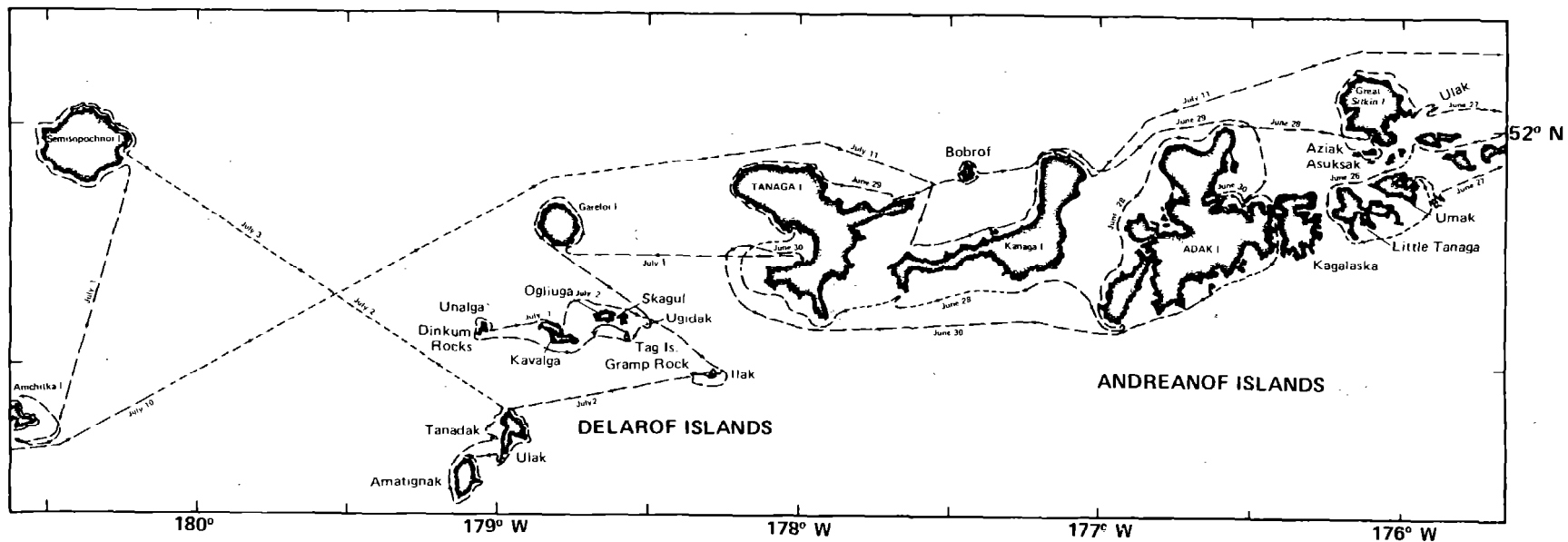


Figure 5. Survey tracklines made between Semisopchnoi I. and Kiska I. Long dashed lines indicate tracks made during the night or in fog; short dashes represent surveys from the 33 m ship; solid tracklines represent surveys made from 4.5 m rafts.

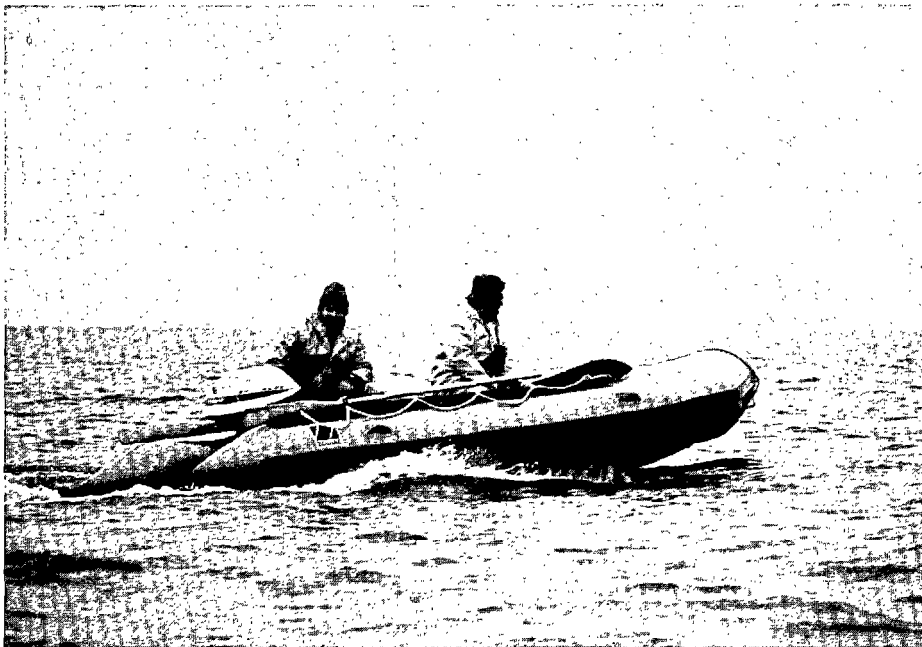
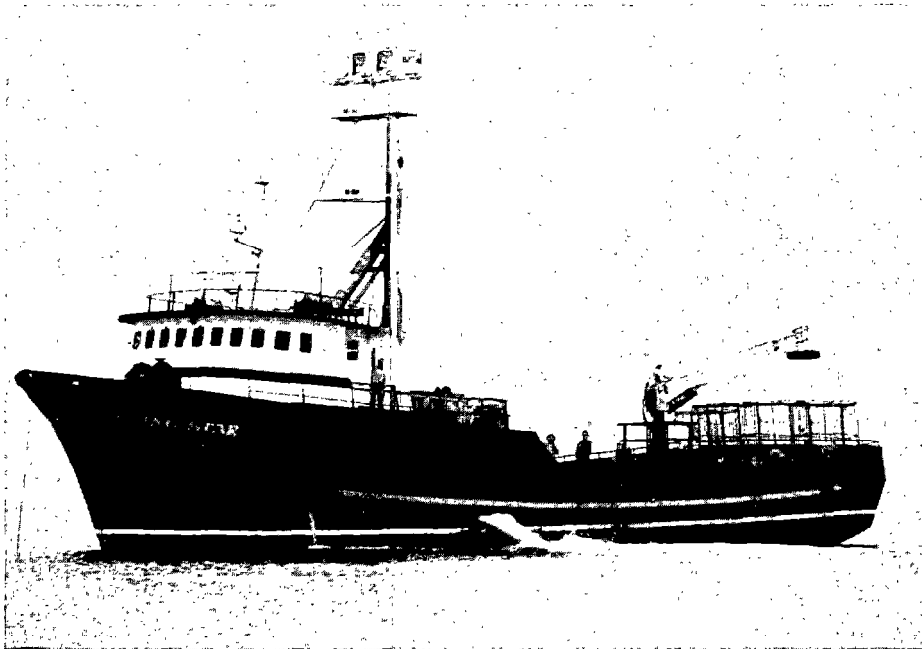


Figure 6 (top)
The 33 meter long *Bering Star* used
to census sea lions in the Aleutian
Islands, 17 June-15 July 1979.

Figure 7 (bottom)
An inflated raft, 4.7 meters long, used
to census sea lions.

Both photographs by David Rugh, NMML

The distance the ship or raft could approach to survey each island varied according to weather (wind and fog), water depth, kelp and tide rips. Areas where no surveys were made are described in the island-by-island accounts in the results section and are apparent in Figures 1-5, depicting vessel tracklines. When a shoreline was viewed from the ship, it was so indicated in Appendix II by noting the platform as "ship". On some occasions the ship was able to approach a shore within 200 m allowing complete and adequate counts of sea lions but perhaps missing a percentage of sea otters and harbor seals; the platform was designated "ship (close)" in these cases. Whenever feasible, rafts were launched to survey a specific shore area, generally one known to be a sea lion haul site or rookery; these surveys are noted as "raft". Raft surveys allowed for the most advantageous viewing distances short of stampeding hauled out animals; however they did involve viewing problems when fog, rain, or rough seas were present. Viewing categories (excellent, good, fair, poor, and unacceptable) were established as parameters of sightability. These are noted in the island-by-island results. When viewing conditions were poor or unacceptable, the count was considered unreliable. Direct infield visual counts were generally made by two or more observers with 7x50 binoculars.

At one site, Saddleridge Point on Seguam Island, a land-based survey was made to compare counts collected from raft surveys (Figs. S-9). This involved a climb along the crest of the overhanging cliffs as well as a walk on the beach. In the latter case all animals except pups were flushed into the water in order to make a pup count. At other sites, beach surveys were made to collect scats and marine mammal specimens from animals that had stranded or died from other causes.

Photographs were taken at most rookery and haul sites. A single-lens reflex camera with motordrive unit and a 70-210 mm zoom lens were used with ASA 400 film for high speed and low light situations. Later, in the laboratory, the color slides were projected on a paper screen for counts of animals. By using a felt-tip pen to mark tallied animals, an accurate count could be made. Where counts from photographs were higher than infield counts, the former were used. This is based on the assumption that there was not overcounting and that the higher figure was a function of the more advantageous counting technique relative to each particular site.

Photographs taken of sea lion concentrations allowed for reevaluation of counts of 82 groups. Because of difficulties in resolution, perspective, and motion, counts from photographs were frequently lower than infield counts. Not all haul sites were photographed, but of those that were, only 29,428 of 34,845 counted infield, or 84%, were visible on the projected slides; only 59% of the original pup counts were found and 49% of the large bulls. Accordingly, if we generally accept infield tallies of pups and males but use results from photographs for adult counts when they were higher than infield tallies, then we can make upward corrections for counts at 14 haul out sites increasing the grand total by 1,426 sea lions; the largest single change was 220 added to a group of 865. We base these corrections on the assumption that the highest count of a concentration of sea lions has the greatest accuracy.



Figure 8 (top)
Biologists counting sea lions on Seguam
Island in the Aleutians during a survey
conducted 17 June-15 July 1979.

Figure 9 (bottom)
A northern sea lion bull surrounded by
females and pups on the Saddleridge
rookery, Seguam Island, in the central
Aleutians, 13 July 1979.

Both photographs by David Rugh, NMML

For the purpose of this survey, sea lions were designated where possible as: bulls (an obvious adult, territorial male); pups (sea lions less than one month old in June with dark or chocolate brown pelage); and others (immature males, adult and immature females, and juveniles of both sexes). When yearlings were recognized, they were noted, but generally this category demanded a scrutiny that involved our being closer to a haul site than sea lions would tolerate.

Two major types of haul sites were defined: rookeries (where pups were obviously present in significant numbers - greater than 100 - and where breeding activity was viewed) and nonbreeding haul sites (where few or no pups were present and where little or no breeding activity takes place). Generally in the text the use of the term haul site refers to nonbreeding areas. Note that on almost any haul site during the breeding season one may occasionally see bulls holding territories, a few pups, and some copulations.

Island names and groupings are those listed in the U.S. Coast Pilot 9, Ninth Edition, January 1979, and in the Dictionary of Alaska Place Names (Orth 1967). The date designates the primary day of the respective island survey. The latitude and longitude represent the location of the largest concentration of sea lions on that particular island or islet. These locations were established from National Ocean Survey, NOAA, nautical charts with 1:120,000 or 1:300,000 resolution.

Sea otter and harbor seal counts are systematically reported whether or not any were seen. Sea otters are designated when possible in this report as pups (which were obviously newborn of the year and always with an adult) and older otter (not attempting to discriminate juveniles from adults). Harbor seals are described when possible as pups (obvious newborn of the year) and older (inclusive of all animals over pup age). Northern fur seal (Callorhinus ursinus) are reported whenever they were sighted. Locations of high concentrations and unusual occurrences are also described.

Sea lion counts and specific notes on their haul site locations are included with other records pertinent to the census. Substrate types are frequently mentioned. The accompanying tables also provide a review of historical counts for each island.

The Alaska Department of Fish and Game (ADF&G, 1973) has updated a rookery and haul site numbering system first used by Kenyon and Rice (1961) and recently revised by Donald Calkins (ADF&G, pers. commun.). To aid in locating specific sites, these numbers have been entered in the following island-by-island accounts.

Historical surveys are primarily based on the results of studies carried out by Karl Kenyon and D. L. Spencer in 1959 and Kenyon with D. W. Rice in 1960 (reported in Kenyon and Rice 1961), by Kenyon, Spencer, and J. J. Burns in 1962 (Kenyon 1962); and by Kenyon and J. G. King in 1965 (Kenyon and King 1965). While these studies were designed primarily as sea otter surveys, the sea lion counts are considered adequate for comparison with the present survey. Comparability of counts has been maximized by subdividing islands into major haul sites to the limits discernible from the

recorded data. In the present island accounts, we have attempted to retain individual haul site or rookery identities where possible and have utilized original survey data where needed to provide this information; hence, these counts, unless combined, may not appear to agree with the published reports and manuscripts. It is evident that the adequacy of specific site identification is critical in order to make accurate trend comparisons. We have here tried to avoid confusion by providing not only island names but the ADF&G site identification numbers and exact latitude and longitudes as well.

Census figures for sea lions of the central Aleutian Islands are also listed in Alaska's Wildlife and Habitat (ADF&G 1973) and in the Final Environmental Impact Statement (NMFS 1978). However, because these documents cite previous studies and do not present original data, they are not referred to in the island-by-island accounts. Other surveys may have occurred in the study area but at times of the year incompatible with counts made during the breeding season. Such surveys are not cited here.

RESULTS

During the 29 days of study from 17 June to 15 July, 68 central Aleutian Islands or islets were visited including the Islands of four Mountains, the Andreanofs, Delarofs, and Rat Islands, as well as Bogoslof and Fire Islands of the Fox Islands group in the eastern Aleutians. Only Oglodak, Fenimore Rock, and Little Kiska had less than 20% survey coverage. Other than these three, the island coverage averaged 81%.

A total of 46,359 sea lions (including 2,431 bulls and 5,417 pups), 3,170 sea otters (including 279 pups), 674 harbor seals (including 15 pups), 7 northern fur seal, 43 minke whale (Balaenoptera acutorostrata), 1 fin whale (Balaenoptera physalus), 3 other rorquals, 63 killer whale (Orcinus orca), 16 harbor porpoise (Phocoena phocoena), 470 Dali's porpoise (Phocoenoides dalli), and 54 beaked whales, plus 7 unidentified whales were counted. These counts are described in Appendices II-V.

Following is an island-by-island account of sites surveyed. The order is from east to west rather than chronological as the ship trackline was confusing due to fog and logistic needs. An alphabetical listing of the islands referred to in the text may be found in Appendix VII.

Fox Islands

Bogoslof (15 July 1979)
(53°56'06"N 168°02'12"W)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - none sighted.

Harbor seals - three sighted.

Northern fur seals - two were hauled out among sea lions on the shore of the northwest cove, one an adult male, the other a subadult male (judged to be 4-5 years old).

Sea lions - a total of 2,377 sea lions were hauled out occupying all suitable locations. Most were on the eastern side on boulder and sand beaches and in a cove on the northwestern shore. Three dead adults and 31 dead pups are not included in the summary counts (Table 1).

Table 1 .--Selected sea lion counts: Bogoslof
ADF&G No. 55

Date	Bulls	Pups	Other	Total	Source
1938	-	-	-	800	Murie 1959
13-14 Aug 57	-	3106	3707 ^{1/}	6813	Mathisen & Lopp 1963
3 Mar 60	-	-	-	1000	Kenyon 1960
7 Apr 62 (1610)	-	-	-	3000 ^{3/}	Kenyon 1962
26 Aug 62	-	2385 ^{2/}	2566 ^{1/}	4951	Fiscus (unpubl notes)
29 Jun 73	900	2328	2400	5638	Byrd et al 1980
14-20 Jun 76	-	291	3308 ^{1/}	3599	Braham et al 1980
29 Jun 77	-	-	-	2328	Braham et al 1980
31 May 78	-	-	-	1000	Day et al 1979
15 Jul 79 (0750-1000)	147	914	1316	2377	present survey

1/ Includes bulls.

2/ 500 dead pups not included in this count.

3/ Includes counts from Fire Island.

Fire Island (15 July 1979)
(53°56'40"N 168°02'50"W)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - none sighted.

Harbor seals - one on the rocks and two in the water.

Sea lions - one on the rocks and three in the water.

Fire Island's precipitous shores are not conducive to a large hauling area (Table 2).

Table 2.--Selected sea lion counts: Fire Island
ADF&G No. 56

Date	Bulls	Pups	Other	Total	Source
3 Mar 60				100	Kenyon 1960
31 May 78	0	0	0	0	Day et al 1979
15 Jul 79 (0740-50)	0	0	4	4	present survey

Islands of Four Mountains:

Uliaga (18 June 1979)
53°03'40"N 169°47'12"W

Survey coverage - 100% by raft with good visibility.

Sea otters - none sighted.

Harbor seals - four were seen.

Sea lions - 181 of the 194 found on Uliaga were on a rock ledge on the north side of West Point. No pups or breeding activity were observed (Table 3).

Table 3.--Selected sea lion counts: Uliaga
ADF&G No. 47

Date	Bulls	Pups	Other	Total	Source
30 Sep - 1 Oct 57	-	-	-	239	Mathison & Lopp 1963
3 Mar 60	-	-	-	500	Kenyon 1960
1969-72	-	-	-	400	Sekora 1973
18 Jun 79 (0920-1040)	13	0	181	194	present survey

Kagamil (18 June 1979)
(53°02'45"N 169°40'35"W)

Survey coverage - 100% by raft with visibility good to excellent.

Sea otters - four of the six sea otters sighted at Kagamil were found in the kelp at Candlestick Point.

Harbor seals - approximately 45 of the 91 seals found at Kagamil were at Candlestick Point; the remainder were on rocks near the eastern point.

Sea lions - 136 adults plus 5 bulls were found on a rock .45 km off the northeast point of Kagamil; 2 others were sighted elsewhere. It is not known if this concentration of sea lions was on the same site as identified by ADF&G No. 48 (Table 4).

Table 4. --Selected sea lion counts: Kagamil (North Point)
ADF&G No. 48

Date	Bulls	Pups	Other	Total	Source
30 Sep - 1 Oct 57	-	-	-	38	Mathisen & Lopp 1963
3 Mar 60	-	-	-	75	Kenyon 1960
7 Apr 62 (1446-51)	-	-	-	50	Kenyon 1962
1969-72	-	-	-	20	Sekora 1973
18 Jun 79 (1046-1220)	5	0	138	143	present survey

Chuginadak (18 June and 14 July 1979)

Survey coverage - 92% by raft on 18 June with visibility poor to good; Concord Point resurveyed 14 July with good visibility.

Sea otters - 6 pups and 25 others were found, principally around Corwin Rock.

Harbor seals - 57 were seen, mostly on the northern and eastern sides of the island.

Sea lions - of the 933 observed around Chuginadak, all but 17 were at Concord Point. The total count on 18 June (587 plus 3 pups) was hampered by bad weather; therefore the 14 July total of 913 is used here for Concord Point (Table 5).

Table 5.--Selected sea lion counts: Chuginadak (Concord Point)
ADF&G No. 46

Date	Bulls	Pups	Other	Total	Source
30 Sep - 1 Oct 57	-	0	212	212	Mathisen & Lopp 1963
3 Mar 60	-	-	-	700	Kenyon 1960
7 Apr 62 (1436-45)	-	-	-	0 ^{1/}	Kenyon 1962
21 Apr 65 (1455)	-	-	-	0 ^{1/}	Kenyon & King 1965
1969-72	-	-	-	341	Sekora 1973
18 Jun & 14 Jul 79 (1802-24 & 1355-1835)	68	3	862	933	present survey

^{1/} Surveyed only north side.

Carlisle (18-19 June 1979)
(52°30'35"N 170°05'08"W)

Survey coverage - 87% of the island was surveyed closely from the ship with good visibility. No survey was made from Dragon Point to West Point.

Sea otters - none sighted.

Harbor seals - 12 were sighted just east of Dragon Point.

Sea lions - all 59 were located on a rock off the northwest point (Table 6).

Table 6.--Selected sea lion counts: Carlisle (Northwest Point)
ADF&G No. 44

Date	Bulls	Pups	Other	Total	Source
1936-38	-	-	-	present	Murie 1959
30 Sep - 1 Oct 57	-	0	45	45	Mathisen & Lopp 1963
3 Mar 60	-	-	-	100	Kenyon 1960
21 Apr 65 (1501)	-	-	-	250 ^{1/}	Kenyon & King 1965
1969-72	-	-	-	175	Sekora 1973
18 June 79 (1454)	7	0	52	59	present survey

^{1/} Surveyed only north side.

Herbert (18-19 June 1979)
(52°45'00"N 170°05'00"W)

Survey coverage - 100% of which 16% was by raft and 84% by ship with visibility fair to good. Fog obscured the southwestern shore in the late afternoon of the 18th, so that area was resurveyed on the 19th. Coverage of the west shore was poor due to the late hour (2047-2125) on the 18th, but the site where sea lions were found (on the southwest tip) was resurveyed on the 19th.

Sea otters - two were seen from the raft on the north side of the island.

Harbor seals - 22 were seen, but because of dusk conditions, seals may have been missed along the west shore on the 18th.

Sea lions - 46 were observed scattered at various locations with most (20) on rocks at the southwesternmost point on the 19th (Table 7).

Table 7.--Selected sea lion counts: Herbert (west and south sides)
ADF&G No. 45

Date	Bulls	Pups	Other	Total	Source
3 Mar 60	0	0	0	0	Kenyon 1960
7 Apr 62 (1429-35)	-	-	-	75 ^{1/}	Kenyon 1962
1969-72	-	-	-	125	Sekora 1973
18-19 Jun 79 (2035-2125 & 0805-1033)	1	0	45	46	present survey

^{1/} East and south sides only; sea lions were observed in the same location as the present survey.

Yunaska (19 June and 14 July 1979)
(52°41'40"N 170°36'40"W)

Survey coverage - 100% of the shoreline was surveyed by raft in poor to fair visibility (poor because of fog and rain) on the 19th of June. Only the major sea lion rookery on the northeast shore was surveyed on 14 July. The rookery was surveyed in clear conditions on both days.

Sea otters - 2 pups and 19 older were sighted distributed around the island; undoubtedly more animals were present.

Harbor seals - 19 were sighted at various locations around the island.

Yunaska (cont'd)

Sea lions - 48 adult bulls, 187 pups, and 1,360 others were counted on 19 June, compared to 96 bulls, 752 pups and 1,085 others sighted on 14 July. These counts came from the rookery on the northeast shore near Lava Flow. At other locations around the island 8 bulls and 33 others were found (Table 8).

Table 8.--Selected sea lion counts: Yunaska (east shore)
ADF&G No. 43

Date	Location code	Bulls	Pups	Other	Total	Source
1936-38		-	-	-	present	Murie 1959
27 May 59	1	-	-	700	800	Kenyon & Rice 1961
(1419-35)	2	-	-	50		
	2	-	-	25		
	2	-	-	25		
7 Apr 62	3	-	-	100	110	Kenyon 1962 ⁶
(1416-19)	4	-	-	10		
21 Apr 65	5	-	-	350	350	Kenyon & King 1965 ⁷
(1515-20)						
1969-72	-	-	-	-	895	Sekora 1973
19 Jun & 14 Jul 79	8	104	752	1393	2249	present survey
(1303-1710 & 0850-1058)						

Locations

- 1 South of northeast shore rookery to East Cove.
- 2 South shore from southeast point to southwest point on offshore rocks.
- 3 North of East Cove.
- 4 Southwest point rocks.
- 5 Two haul sites 2 and 4 km west of northeast shore rookery.
- 6 Survey of south shore only.
- 7 Survey of north shore only.
- 8 Northeast shore near Lava Flow.

Chagulak (13 July 1979)
(52°33'56"N 171°08'10"W)

Survey coverage - 100% coverage by raft with excellent visibility.
Coverage included outlying rocks. No survey occurred on
19 or 20 June during the outbound voyage through the area due to
dense fog.

Sea otters - none sighted.

Harbor seals - Nine were hauled out on the east side of the
southwesternmost point.

Sea lions - 51 were located on a rock ledge on the east side of the
southwesternmost point. This may be the same as Chagulak
Point, referred to by ADF&G No. 42 (there are no named points
listed in the U.S. Coast Pilot No. 9, 1979; ninth edition)
(Table 9).

Table 9. --Selected sea lion counts: Chagulak (Chagulak Point)
ADF&G No. 42

Date	Bulls	Pups	Other	Total	Source
1936-38	-	-	-	present	Murie 1959
27 May 59 (1355)	-	-	-	100 ^{1/}	Kenyon & Rice 1961
21 Apr 65 (1530)	-	-	-	0 ^{2/}	Kenyon & King 1965
1969-72	-	-	-	120	Sekora 1973
13 Jul 79 (2045-2130)	4	0	47	51	present survey

^{1/} Sea lions were on rocks off SE corner near SE Chagulak (ADF&G No. 42).

^{2/} Survey of the north side only (missed Chagulak and SW point).

Amukta (20 June and 13 July 1979)
(52°27'55"N 171°18'31"W)

Survey coverage - 100% by raft with excellent visibility on
13 July including adjacent rocks. Coverage was complete
but inhibited by heavy fog on 20 June.

Sea otters - 13 were sighted, most between the southwest point
and east around the island to Wreck Point (named by us for
a wrecked barge ashore there).

Harbor seals - 24 older and 1 pup were found from the southwest
point east around the island to the northeast point.

Sea lions - 180 plus 11 pups were hauled out on a cobblestone/ boulder beach west of the southwest point (which may be ADF&F No. 41b, Amukta Point). On a rock near High Rock, 54 were found, and 9 were found elsewhere around the island (Table 10).

Table 10.--Selected sea lion counts: Amukta
ADF&G No. 41

Date	Location Code	Bulls	Pups	Other	Total	Source
1936-38		-	-	-	present	Murie 1959
27 May 59	1	-	-	400	750	Kenyon & Rice 1961
(1350-1490)	2	-	-	200		
	3	-	-	150		
7 Apr 62	2	-	-	100	100	Kenyon 1962 ^{1/}
(1406-11)						
21 Apr 65	1	20	-	180	200	Kenyon & King 1965 ^{2/}
13 Jul 79	1	7	11	173	254	present survey
(1910-2025)	3	1	0	53		
	Misc.	3	0	6		

Locations:

- 1 Beach west of SW point.
- 2 High Rock and adjacent rocks (ADF&G No. 41a).
- 3 Amukta Point (ADF&G No. 41b).

^{1/} Surveyed east to southwestern side only.

^{2/} Surveyed north to southwest point only.

Andreanof Islands

Seguam (21 June and 12-13 July 1979)
(52°21'00"N 172°34'00"W)

Survey coverage - 100% of which 34% was by raft and 66% by ship with visibility good to excellent on 21 June. The view from the ship was considered adequate to count any hauled out sea lions. On 12-13 July only Saddleridge Point was surveyed; this included raft and land-based counts both from cliffs above the rookery and by a walk along the rookery beach, all under excellent viewing conditions.

Sea otters - 37 pups and 127 older were counted. Most (27 pups and 78 older adults) were sighted from the raft between Saddleridge Point and Finch Cove on the northwestern and north side of Seguam.

Harbor seals - Four were sighted near the navigation light on the north shore.

Sea lions - 7,522 is the maximum count for the island. There were five haul sites around the island each containing 100 or more sea lions and each with a few pups. The major rookery was located in a cove just east of Saddleridge Point on the northwestern shore. Saddleridge Point rookery was counted five times (see Table 1). Lava Point on the south shore showed evidence of being able to hold a much larger number of animals than were there during the survey (Table 11).

Table 11a. --Selected sea lion counts: Seguam
ADF&G No. 40

ADF&G No.	Location	(Kenyon & Rice) ^{1/}	(Kenyon 1962) ^{1/}	(Kenyon & King) ^{1/}	(Sekora 1973) ^{2/}	Present ^{2/}
		1961 27 May 59 (1321-40)	7 Apr 62 (1321-40)	1965 6 May 65 (1545-1616)	1969-72	Survey 21 June & 13 July 1979
40a	Southwest Point	150	100	160	125	20
40b	Lava Point	150	300	300	640	372
40c	Wharf Point	100	200	500	233	42
40d	(4 km west Moundhill Point)	-	-	10	169	145
40e	Saddleridge Point ^{3/}	25	575	3230	35	6493
40f	Southwestern Point (3.2 km W Turf Pt)	-	300	-	125	277
	Total	425	2175	4400	1327	7522 ^{4/}

^{1/} Aerial surveys.

^{2/} Surface surveys.

^{3/} Includes counts of haul sites from just west of Light to just east of Southwest Point. During present survey most animals concentrated near Saddleridge Point.

^{4/} Includes 173 sea lions from other locations.

Table 11b. --Seguam Island count during present survey.

	Present survey	Bulls	Pups	Other	Total
40a	Southwest Point	0	0	20	20
40b	Lava Point	32	14	326	372
40c	Wharf Point	1	0	41	42
40d	(4 km west Moundhill Point)	12	4	129	145
40e	Saddleridge Point	202	2475	3816	6493
40f	Southwestern Point	16	5	256	277
	Misc.	24	2	47	173

Agligadak (22 June 1979)
(52°06'10"N 172°54'00"W)

Survey coverage - 100% by raft and ship (close) with excellent visibility.

Sea otters - none sighted.

Harbor seals - none sighted.

Sea lions - 993 were counted, and pups were heard but not sighted (Table 12).

Table 12. --Selected sea lion counts: Agligadak
ADF&G No. 39

Date	Bulls	Pups	Others	Total	Source
26 May 59	-	-	-	250	Kenyon & Rice 1961
7 Apr 62	-	-	-	3000	Kenyon 1962
21 Apr 65	-	-	-	900	Kenyon & King 1965
1969-72	-	-	-	120	Sekora 1973
22 Jun 79 (1400-1545)	44	present	949	993	present survey

Tanadak (22 June 1979)
(52°04'15"N 172°51'25"W)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - 89 older were seen in a large kelp bed on the west side of the islet.

Harbor seals - none sighted.

Sea lions - 186 adults and 1 pup were sighted; other pups were heard, but this did not appear to be a major rookery (Table 13).

Table 13.--Selected sea lion counts: Tanadak
ADF&G No. 38

Date	Bulls	Pups	Other	Total	Source
26 May 59	-	-	-	20	Kenyon & Rice 1961
7 Apr 62	-	-	-	400	Kenyon 1962
21 Apr 65	-	-	-	300	Kenyon & King 1965
1969-72	-	-	-	260	Sekora 1973
22 Jun 79 (1200-55)	24	1	162	187	present survey

Sagigik (22 June 1979)
(52°00'50"N 173°09'00"W)

Survey coverage -100% by ship (close) with excellent visibility.

Sea otters - none sighted.

Harbor seals - none sighted.

Sea lions - 258 older animals plus 4 pups of which all but 8 were on the east-facing rocks (Table 14).

Table 14.--Selected sea lion counts: Sagigik
ADF&G No. 37

Date	Bulls	Pups	Other	Total	Source
26 May 59	-	-	-	100	Kenyon & Rice 1961
7 Apr 62	-	-	-	600	Kenyon 1962
6 May 65	-	-	-	600	Kenyon & King 1965
22 Jun 79 (0837-0900)	31	4	227	262	present survey

Amlia (22-24 June and 12 July 1979)
(52°05'25"N 172°58'01"W)

Survey coverage - 91% coverage of which 23% was by raft and 68% by ship with visibility ranging from poor to excellent. The unsurveyed portion of the island was primarily along the south shore in areas with low probabilities of having sea lions.

Sea otters - 24 pups plus 185 older were sighted around the island. Most sightings were from rafts which suggests that 77% of the island was inadequately surveyed for sea otters. No sea otters were seen around the eastern cape even though it was surveyed by raft.

During a raft survey on the north side of the island near the anchorage of 22 June, 12 pups and 108 older sea otters were counted within a distance of 9 km. In Sviechnikof Harbor nine otter were seen on 23 June. During a survey from Cape Misty westward to about 10 km on 24 June, 6 pups and 28 older sea otters were counted in poor visibility. In Amlia Pass 33 otter were seen from the ship on 24 June.

Harbor seals - 1 was seen in the north side anchorage cove and 1 was seen in Sviechnikof Harbor. Most of the island was inadequately surveyed for seals, but the lack of sightings from rafts was surprising.

Sea lions - 3,439 sea lions were seen around the island. Most (2,463 animals) were located on the north and south sides of the eastern cape, (Agligadak Point) referred to as Amlagim gigangaa or "the eastern end of Amlia" by Netsvetov (Black 1980). The ledges on the north side, extending 3 km west of the cape, would be awash during severe northwesterly storms. Ledges on the southeastern side were similar. Some males were territorial, and though pups were heard, none were seen.

At Cape Misty 106 sea lions were counted with room for many more. No pups nor breeding activity were noted. A total of 867 sea lions were seen on a rocky point which is the western headland of Sviechnikof Harbor. No pups were sighted even though 31 of the sea lions appeared to be territorial males. Sea lions of Agligadak, Sagigik, and Tanadak Islands are reported separately (Table 15).

Table 15.--Selected sea lion counts: Amlia
ADF&G No. 36

Date	Location code	Bulls	Pups	Other	Total	Source
26 May 59 (1634-1800)	1 2 3	- - -	- - -	750 800 700	2250	Kenyon & Rice 1961 ^{1/}
7 Apr 62 (1240-1315)	1 2	- -	- -	50 150	200	Kenyon 1962 ^{2/}
21 Apr 65 (1618-57) and	1 2 3	- - -	- - -	156 300 2500	2956	Kenyon & King 1965
6 May 65 (1505-35)						
24 Jun 79 (0930-1045)	1	1	0	105	3439	present survey
24 Jun 79 (0710-40)	2	31	0	836		
22 Jun 79 (1625-1705)	3a	51	?	1236		
12 Jul 79 (1343-1427)	3b	33	0	1143		

Locations:

- 1 Cape Misty (ADF&G No. 36a).
 2 Rocks off entrance of Sviechnikof Harbor (ADF&G No. 36b).
 3 Agligadak Point (eastern cape) (ADF&G No. 36c).
 3a Agligadak Point (north side).
 3b Agligadak Point (south side).

^{1/} This survey listed 600 sea lions near Cape Misty and groups of 100 and 50 up to 5 km east of there.

^{2/} South side only.

Atka (24-25 June 1979)
(52°24'20"N 174°17'45"W)

Survey coverage - 53% coverage of which 17% was by raft and 36% by ship. Visibility was good to excellent. The survey was directed at areas of known or suspected sea lion haul sites only.

Sea otters - 33 older sea otters, no pups, were seen from the ship in Amlia Pass on 24 June. Later that day Nazan Bay was surveyed by raft and ship and 14 sea otter were counted. On 25 June the ship passed close to shore from Cape Shaw north and westward to Korovin Bay during which time only five sea otters were sighted. On the eastern side of Korovin Bay, 26 sea otter were seen from the ship. On the west side of the same bay between Sarana Cove and Egg Point, 5 pups and 39 older sea otters were counted from a raft survey. A single sea otter was sighted off Salt Island.

Harbor seals - 1 was sighted from a raft in Sarana Cove.

Sea lions - 1,192 were counted around the island of which 1,178 were on an unnamed cape (here called Four Stack Cape for the four detached pillars aligned seaward of the cape; latitude/longitude is given above). This cape is referred to as Tunmisax, a promontory called Cape Potainikof, by Netsvetov (Black 1980), and is 9 km west of North Cape. The sea lions lay on available ledges among the pillars. Territorial males were on large rock slabs, but no pups were present. There was room for more sea lions to haul out. At another site 2 km southeast of North Cape, 12 sea lions including 1 bull were seen (Table 16).

Table 16. --Selected sea lion counts: Atka
ADF&G No. 32

Date	Location code	Bulls	Pups	Other	Total	Source
26 May 59					650	Kenyon & Rice 1961
	(1528-1633 S side)					
	(1805-1917 N side)					
	1	-	-	100		
	1, 2, 3	-	-	150		
	3	-	-	300		
	4	-	-	100		
6 Apr 62	1	-	-	1800 ^{1/}	4575	Kenyon 1962
	(1115-1337)	2	-	500		
		3	-	2000		
		5	-	75		
		4	-	200		
21 Apr 65	6	-	-	3000	3000	Kenyon & King 1965
25 Jun 75	(0757)1	1	0	11	1192	present survey
	(0905-57)	3	27	0	1151	
	(0545-1245) Misc.	0	0	2		

Locations:

- 1 Southeast of North Cape.
- 2 North Cape (ADF&G No. 32a).
- 3 Four Stack Cape (see text description).
- 4 Cape Korovin (ADF&G No. 32b).
- 5 Cape north of Shallow Bay.
- 6 Southeast of North Cape to Cape Korovin and possibly including Salt Island.

^{1/} Distributed on three different locations.

Amtagis (24 June 1979)
(52°10'00"N 174°25'40"W)

Survey coverage - 100% by raft with good visibility.

Sea otters - 4 pups and 11 older sea otters were seen in kelp around the island.

Harbor seals - 32 were hauled out on rocks, mostly on the eastern side of the island.

Sea lions - none sighted (Table 17).

Table 17.--Selected sea lion counts: Amtagis
ADF&G No. 35

Date	Bulls	Pups	Other	Total	Source
26 May 59	-	-	-	800	Kenyon & Rice 1961
6 Apr 62	-	-	-	2000	Kenyon 1962 ^{1/}
6 May 65	-	-	-	1900	Kenyon & King 1965 ^{2/}
24 Jun 79 (1410-25)	0	0	0	0	present survey

1/ Sagchudak count included.

2/ May include Sagchudak count.

Sagchudak (24 June 1979)
(52°01'00"N 174°29'00"W)

Survey coverage - 100% by raft with good visibility.

Sea otters - 8 pups and 50 older sea otters were sighted around the island although most were in kelp between Sagchudak and Atka.

Harbor seals - 101 were hauled out on rock ledges of the southwestern shore and on rocks off the northeastern shore.

Sea lions - 10 were hauled out at two locations: on an offshore rock west of Sagchudak; and on rock ledges on the south side of the island (Table 18).

Table 18. --Selected sea lion counts: Sagchudak

Date	Bulls	Pups	Other	Total	Source
26 May 59	-	-	-	1200	Kenyon & Rice 1961
6 Apr 62	-	-	-	2000	Kenyon 1962 ^{1/}
6 May 65	-	-	-	1900	Kenyon & King 1965 ^{2/}
1969-72	-	-	-	360	Sekora 1973
24 Jun 79 (1317-1402)	1	0	9	10	present survey

1/ Included in Amtagis count.

2/ May be included in Amtagis count.

Salt Island (25 June 1979)
(52°10'30"N 174°38'30"W)

Survey coverage - 35% by ship with good visibility.

Sea otters - none sighted (count unreliable).

Harbor seals - none sighted (count unreliable).

Sea lions - none sighted (count reliable for the north shore and adjacent rocks to the southeast) (Table 19)

Table 19. --Selected sea lion counts: Salt Island^{1/}
ADF&G No. 33

Date	Bulls	Pups	Other	Total	Source
26 May 59	-	-	-	100	Kenyon & Rice 1961
6 Apr 62	-	-	-	800	Kenyon 1962
25 Jun 79 (1308-35)	0	0	0	0	present survey

1/ Actual location of the haul site is on rocks to the south of Salt Island.

Koniuji (25 June 1979)
(52°13'15"N 175°07'20"W)

Survey coverage - 100% of which 50% was by raft and 50% by ship
(close) with excellent visibility.

Sea otters - One pup and three older sea otters sighted.

Harbor seals - none sighted.

Sea lions - 109 including 3 territorial bulls were hauled out on
sloping ledges on the southwest of the island. No pups were
seen (Table 20).

Table 20.--Selected sea lion counts: Koniuji (Northern Point)
ADF&G No. 30

Date	Bulls	Pups	Other	Total	Source
27 May 59 (1204-06)	-	-	-	20	Kenyon & Rice 1961
7 Apr 62	-	-	-	1500	Kenyon 1962
1969-72	-	-	-	15	Sekora 1973
25 Jun 79 (1520-55)	3	0	106	109	present survey ^{1/}

^{1/} This was a location different from ADF&G No. 30 as found by
Sekora 1973.

Kasatochi (25 June 1979)
(52°10'25"N 175°29'20"W)

Survey coverage - 100% of which 50% was by raft and 50% by ship
(close) with excellent visibility.

Sea otters - Four pups and eight older sea otters were seen from the
raft on the east and north sides of the island. On the south and
west sides only one otter was seen from the ship.

Harbor seals - none sighted.

Sea lions - 1,874 were counted on 2 rookeries close together on the
north and northwestern sides of the island. The north rookery
is composed of rocky ledges and giant boulders which may be
subdivided into three rookery and haul sites. A total of 55
bulls, 125 pups, and 1,214 other sea lions were counted on the
north site. The second site, located a short distance to the
southwest, is primarily a high ledge that slopes into the sea.

A total of 22 bulls, 88 pups, and 629 other sea lions were counted here. Elsewhere around the island 33 sea lions were seen (Table 21).

Table 21.--Selected sea lion counts: Kasatochi (North Point)
ADF&G No. 29

Date	Bulls	Pups	Other	Total	Source
27 May 59 (1155-58)	-	-	-	200	Kenyon & Rice 1961
7 Apr 62	-	-	-	2000	Kenyon 1962
1969-72	-	-	-	1200	Sekora 1973
25 Jun 79 (1740-1830)	79	213	1874	2166	present survey

Oglodak (26-27 June 1979)
(51°59'00"N 175°26'30"W)

Survey coverage - 0%. This island was approached 26 and 27 June; however it was shrouded with fog too thick to safely launch a raft survey. Strong tide rips occur at both the east and west ends of the island (Table 22).

Table 22.--Selected sea lion counts: Oglodak (west end)
ADF&G No. 28

Date	Bulls	Pups	Other	Total	Source
26 May 59 (1920)	0	0	0	0	Kenyon & Rice 1961
6 Apr 62 (1112)	0	0	0	0	Kenyon 1962
30 Apr 65 (1125-40 ^{1/})	0	0	0	0	Kenyon & King 1965
1969-72	-	-	-	55	Sekora 1973

^{1/} This survey time includes other nearby islands.

Ikiginak (27 June 1979)
(51°58'40"N 175°29'30"W)

Survey coverage - 100% by raft with only fair visibility due to fog.
Tide rips on the east side made it hazardous to round the eastern point.

Sea otters - Four pups and 25 older sea otters were seen in the kelp beds on the north and west sides of the island. One sea otter was seen standing on a kelp covered rock.

Harbor seals - Two were sighted.

Sea lions - Five were seen in the waters around the island (Table 23).

Table 23. --Selected sea lion counts: Ikiginak
ADF&G No. 31a

Date	Bulls	Pups	Other	Total	Source
26 May 59 (1921)	-	-	-	500	Kenyon & Rice 1961
6 Apr 62 (1109)	0	0	0	0	Kenyon 1962
30 Apr 65 (1125-40 ^{1/})	0	0	0	0	Kenyon & King 1965
1969-72	0	0	0	0	Sekora 1973
27 Jun 79 (1015-50)	0	0	5	5	present survey

^{1/} This survey time includes other nearby islands.

Fenimore Rock (26-27 June 1979)
(51°58'40"N 175°32'30"W)

Survey coverage - 0%. Thick fog prevented any observations.
See Table 24.

Table 24. --Selected sea lion counts: Fenimore Rock
ADF&G No. 31b

Date	Bulls	Pups	Other	Total	Source
6 Apr 62 (1106)	-	-	-	500	Kenyon 1962
30 Apr 65 (1125-40 ^{1/})	-	-	-	100	Kenyon & King 1965

^{1/} This survey time includes other nearby islands.

Tagalak (26-27 June 1979)
(51°58'00"N 175°43'00"W)

Survey coverage - 44% by ship with good visibility along the north and south shores.

Sea otters - none sighted (count unreliable). Sea otters could be expected in the eastern islets which were not closely approached.

Harbor seals - none sighted.

Sea lions - none sighted.

Chugul (26-27 June 1979)
(51°57'00"N 175°49'00"W)

Survey coverage - 46% by ship (close) with good visibility along the north and south shores.

Sea otters - none sighted (count unreliable).

Harbor seals - none sighted.

Sea lions - none sighted.

Igitkin (26 June 1979)
(51°59'00"N 175°55'00"W)

Survey coverage - 50% by ship (close) with excellent visibility.

Sea otters - 69 were sighted along the south shore as follows: from the southeastern point to "Ancel's Bight" (51°58'25"N 175°56'16"W), 26 sea otters were counted; in Ancel's Bight 5 sea otters were seen; and from Ancel's Bight to Igitkin Point, 38 were seen. Harbor seals - none sighted.

Sea lions - none sighted (Table 25).

Table 25.--Selected sea lion counts: Igitkin (Southwest Point)
ADF&G No. 27

Date	Bulls	Pups	Other	Total	Source
27 May 59	-	-	-	700 ^{1/}	Kenyon & Rice 1961
6 Apr 62	0	0	0	0	Kenyon 1962
25 Apr 65	0	0	0	0	Kenyon & King 1965
26 Jun 79	0	0	0	0	present survey
(0935-49)					

^{1/} Located on rocks just north of Ancel's Bight (51°58'25"N, 175°56'16"W).

Anagaksik (27 June 1979)
 (51°52'50"N 175°54'59"W)

Survey coverage - 10% by raft with excellent visibility.

Sea otters - none sighted.

Harbor seals - none sighted.

Sea lions - 123 of the 124 were hauled out at the southwesternmost point (Table 26).

Table 26.--Selected sea lion counts: Anagaksik
 ADF&G No. 26

Date	Bulls	Pups	Other	Total	Source
27 May 59 (1116)	-	-	-	700	Kenyon & Rice 1961
6 Apr 62 (1005)	-	-	-	300	Kenyon 1962
25 Apr 65 (1150)	-	-	-	475	Kenyon & King 1965
1969-72	-	-	-	145	Sekora 1973
27 Jun 79 (0705-0810)	4	0	120	124	present survey

Ulak (27 June 1979)
 (52°02'00"N 175°54'00"W)

Survey coverage - 90% by ship (close) with good visibility.

Sea otters - 1 pup and 12 older sea otters were sighted, mostly along the southern shore.

Harbor seals - Five were hauled out at the western end.

Sea lions - none sighted. This steep-sided island is not particularly well suited for haul sites.

Great Sitkin (27 June 1979)
(52°06'35"N 176°05'25"W)

Survey coverage - 84% of which 27% was by raft and 57% by ship (close) with good to excellent visibility. Yoke Bay was the principal unsurveyed portion, an area in which few sea lions were expected.

Sea otters - 13 pups and 91 older sea otters were found around the island. From Bugle Point to Teapot Rock, 11 sea otters were sighted from the ship. In the Teapot Rock vicinity, 20 sea otters were counted. Along the north shore 13 pups and 43 older were counted from a raft. On entering Sand Bay through Great Sitkin Pass, 15 sea otters were counted. No sea otters were observed during a raft survey of Sand Bay.

Harbor seals - 8 were observed in a cove on the north side of the island just west of the old red light base.

Sea lions - 312 were counted around the island. One site, a rock shelf 5 km northnortheast of Swallow Head Light, had 4 adult males and 137 others. Only about half of the available space at this site was occupied. A second site, 0.5 km west of the first, was a rock ledge on which 3 adult males and 160 others were hauled out. No pups were seen or heard at either location (Table 27).

Table 27.--Selected sea lion counts: Great Sitkin (Swallowhead)
ADF&G No. 25

Date	Location code	Bulls	Pups	Other	Total	Source
27 May 59 (1122-42)	1	-	-	400	650	Kenyon & Rice 1961
	2	-	-	200		
	3	-	-	50		
6 Apr 62 (1350-1407)	1	-	-	100	450	Kenyon 1962
	2	-	-	300		
	3	-	-	50		
25 Apr 65 (1243)	1	-	-	100	181	Kenyon & King 1965
	2	-	-	25		
	3	-	-	16		
	4	-	-	30		
	5	-	-	10		
1969-72		-	-	-	440	Sekora 1973
27 Jun 79 (1515-1615) (1415-1710)	1	4	0	137	312	present survey
	2	3	0	160		
	Misc.	0	0	8		

Locations:

- 1 Rock shelf 5 km north-northeast of Swallow Head Light.
- 2 Rock ledge 0.5 km west of location 1.
- 3 Swallowhead.
- 4 Near Swallowhead (west 7).
- 5 Near Swallowhead (west ?).

Kanu (26 June 1979)
(51°55'50"N 176°02'30"W)

Survey coverage - 20% by ship (close) with good visibility along the south shore.

Sea otters - none sighted.

Harbor seals - none sighted.

Sea lions - none sighted. Nor were any seen during Kenyon's surveys of 26 May 1959, 6 April 1962, 25 April 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965).

Tanaklak (27 June 1979)
(51°57'00"N 176°06'00"W)

Survey coverage - 75% by ship (close) with visibility good to excellent covering west,, south, and east shores.

Sea otters - 75 adults were sighted.

Harbor seals - 15 were sighted.

Sea lions - none sighted. Nor were any seen during Kenyon's surveys on 26 May 1959, 6 April 1962, and 25 April 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965).

Asuksak (26-27 June 1979)
(51°56'00"N 176°06'00"W)

Survey coverage - 100% with 30% by ship (close) on the north shore and 70% by ship from a distance along the other shores with visibility good to excellent.

Sea otters - 1 pup and 13 older sea otters were seen.

Harbor seals - Eight were seen along the north shore.

Sea lions - none seen. Nor were any seen during Kenyon's surveys of 26 May 1959, 2 April 1962, and 25 April 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965).

Aziak (27 June 1979)
(51°57'00"N 176°09'00"W)

Survey coverage - 30% by ship (close) with visibility good to excellent.

Sea otters - 15 were distributed along the north and east sides of the island.

Harbor seals - 12 sighted.

Sea lions - none sighted. Nor were any seen during Kenyon's surveys of 26 May 1959, 6 April 1962, and 25 April 1965 (Kenyon and Rice 1961; Kenyon 1962; and Kenyon and King 1965).

Umak (26-27 June 1979)
(51°53'00"N 176°00'00"W)

Survey coverage - 40% by ship (close) with visibility good to excellent along the north shore and in Umak Bight. The Bight was surveyed by raft on 26 June and from the ship both on 26 and 27 June.

Sea otters - 2 pups and 62 older sea otters were seen along the north shore while 30 sea otters were seen in Umak Bight.

Harbor seals - 11 were seen in the vicinity of Cape Chakik and 2 were observed along the north shore of Umak Bight.

Sea lions - none sighted.

Little Tanaga (26 June 1979)
(51°49'15"N 176°13'45"W)

Survey coverage - 24% by ship (close) with visibility fair to good along the northwestern and west sides of the island. The coast to the east was fog covered.

Sea otters - One was sighted off Tana Bight.

Harbor seals - none sighted.

Sea lions - 196 were hauled out on rocks and ledges from Tana Point southeastward about 2 km. No pups nor breeding activity were noted (Table 28).

Table 28.--Selected sea lion counts: Little Tanaga (Tana Point)
ADF&G No. 24

Date	Bulls	Pups	Other	Total	Source
27 May 59	-	-	-	450	Kenyon & Rice 1961
6 Apr 62	-	-	-	300	Kenyon 1962
25 Apr 65	-	-	-	0	Kenyon & King 1965
26 Jun 79 (1200)	7	0	189	196	present survey

Kagalaska (30 June 1979)
(51°48'00"N 176°22'00"W)

Survey coverage - 25% by ship (close) with good visibility along the western shore.

Sea otters - 11 were sighted in Kagalaska Strait including 6 in a cove just south of Laska Cove.

Harbor seals - none sighted.

Sea lions none sighted. On 27 May 1959 Kenyon and Rice (1961) reported 50 sea lions in the waters of Kagalaska Strait. None were seen on 6 April 1962 nor on 25 April 1965 (Kenyon 1962; Kenyon and King 1965).

Adak (28-30 June 1979)
(51°37'32"N 176°59'15"W)

Survey coverage - 55% by ship (close) with visibility good to excellent around the entire island; bays indenting the western and southern shores were not examined. The rookery at Lake Point was surveyed by raft during a light rain squall which made counting difficult.

Sea otters - 85 were sighted around the island. Between Cape Adagak and the rocks in the east side of Andrews Bay, 18 were sighted. None were observed between Cape Moffet and Cape Kiguga. From Cape Kiguga to Hook Point along the western shore 67 were counted. Deep bays were not surveyed and may have contained substantial numbers of uncounted sea otters.

Harbor seals - 20 were sighted on rocks along the eastern side of Andrews Bay.

Sea lions - 1,367 were seen around the island. All but 2 were on one of the two haul sites. At Lake Point there is a rookery on

sloping rock ledges on the south side of the point which contained 61 territorial and 42 nonterritorial males, 20 pups, and 972 others. The haul site at Cape Yakak was located on a rock with eastward sloping ledges just below the light. Altogether 270 sea lions were counted with no pups and no evident breeding activity (Table 29).

Table 29. --Selected sea lion counts: Adak
ADF&G No. 23

Date	Location code	Bulls	Pups	Other	Total	Source
24-25 May 59	1	-	-	1000	3350	Kenyon & Rice 1961
	2	-	-	1500		
	6	-	-	800		
	5	-	-	50		
6 Apr 62	2	-	-	200	300	Kenyon 1962
	3	-	-	100		
26 Apr 65	2	-	-	500	610	Kenyon & King 1965
	3	-	-	100		
	5	-	-	10		
1969-72	1	-	-	0	726	Sekora 1973
	2	-	-	20		
	3	-	-	0		
	4	-	-	700		
	7	-	-	6		
28 Jun 79 (0730-1200) and	1	0	0	0	1367	present survey
	2	0	0	0		
	3	0	0	270		
30 Jun 79 (1310-1643)	4	103	20	972		
	5	0	0	0		
	Misc	0	0	2		

Locations:

- 1 Argonne Point (ADF&G No. 23a).
- 2 Hook Point (ADF&G No. 23b).
- 3 Cape Yakak (ADF&G No. 23~).
- 4 Lake Point (ADF&G No. 23d).
- 5 Rock Cape Moffett (ADFLG No. 23e).
- 6 Cape Point.
- 7 Rock Cape Point

Kanaga (28-29 June and 11 July 1979)
(51°56'00"N 177°09'00"W)

Survey coverage - 30% by ship with visibility poor on 28 June along the southern shore and good to excellent along the northern shores on 29 June and 11 July. The south shore was surveyed from Cape Chlanak to Cape Tusik plus Cape Chunu. The north shore was surveyed from the west end to Round Head. A raft survey was made of the islets of Ship Rock and of North Cape.

Sea otters - One pup and five older sea otters were seen along the south shore between Capes Chlanak and Tusik on 28 June. On 11 July, between The Signals and Ship Rock, 10 sea otters were counted. Near the islets of Ship Rock, 4 pups and 17 older sea otters were seen during a raft survey. Between these islets and Cape Miga 5 sea otters were seen. During a raft survey of Cape Miga, 6 pups and 31 older sea otters were seen. Between Cape Miga and Round Head, 20 older sea otters were counted from the ship.

Harbor seals - 3 pups and 63 adults were counted on 11 July along the north shore of Kanaga.

Sea lions - 492 were seen around the island. Only one was seen in the waters off Cape Chunu. There was no indication of any haul site in that area.

On an islet 0.5 km east of Ship Rock, 170 sea lions were counted. There was no evidence of breeding activity at this haul site.

At Cape Miga, 13 sea lions were counted on offshore rocks and a boulder beach.

At North Cape and vicinity 309 sea lions were counted on rocks and boulder beaches on 11 July. This was apparently not a breeding site although 14 of the animals were territorial males. No animals were seen here on our survey of the area 29 June (Table 30).

Table 30. --Selected sea lion counts: Kanaga
ADF&G No. 22

Date	Location code	Bulls	Pups	Other	Total	Source
25-26 May 59		25 ^{1/}	-	0	25	Kenyon & Rice 1961
5-6 Apr 62			0	0	0	Kenyon 1962
26 Apr 65 (1545)	3 2	- -	- -	150 25	175	Kenyon & King 1965
1969-72	2	-	-	-	260	Sekora 1973
Summer 1977	2 3 ?	5 9 0	0 0 0	130 15 117	276 ^{2/}	Day et al 1978
28-29 Jun 79 & 11 Jul 79 (1140-1235 & 1405-50)	3 1 2	2 14 0	0 0 0	168 295 14	498	present survey

Locations:

- 1 North Cape.
- 2 Cape Miga (ADF&G No. 22).
- 3 Islets near Ship Rock.

1/ Sea lions were in the water.

2/ Non-breeding group.

Bobrof (29 June 1979)
(51°54'00"N 177°26'00"W)

45

Survey coverage - 100% by ship (close) with excellent visibility.

Sea otters - Five were sighted.

Harbor seals - none sighted.

Sea lions - none sighted.

Table 31.--Selected sea lion counts: Bobrof
ADF&G No. -- none

Date	Bulls	Pups	Other	Total	Source
26 May 59	0	0	0	0	Kenyon and Rice 1961
26 Apr 65 1965	-	-	-	100 ^{1/}	Kenyon and King 1965
Summer 1977	0	0	0	0	Day et al 1978
29 Jun 79 (1648-1743)	0	0	0	0	present survey

^{1/} Northeastern end.

Tanaga (28-30 June 1979)
51°5'00"N 177°57'00"W)

Survey coverage - 52% by ship (close) with visibility fair to excellent. On 28 June the southern shore was surveyed from Cape Sasmik westward to Tanaga Bay. The northern shore was surveyed 29 June from Tanaga Bay north and east to Cape Sudak. The northern part of Tanaga Bay (including Cable Bay) was surveyed by raft on 28 June and the stranded carcasses of two beaked whales, Mesoplodon stejnegeri, were found. Measurements were taken and skulls collected. The remainder of the skeletons were placed above the high storm tide line with the location marked for future recovery.

Sea otters - 5 pups and 123 older sea otters were sighted around the island. Most were seen between Cape Sasmik and Tanaga Bay on 28 June. On the north side, 4 pups and 14 older sea otters were sighted between Bumpy Point and Gage Point.

Harbor seals - Two were seen in Tanaga Bay and one on the north side of the island.

Sea lions - 493 were counted around the island. Except for 5 animals, all of these sea lions were located on three haul sites. On a rock off the southwest end of Cape Sasmik, 30 sea lions were seen. On the north side 16 sea lions were counted, one with a fragment of net around its neck. At Bumpy Point, on sloping rock ledges on the south side of the point, 442 sea lions were counted. No breeding activity was noted at any of these locations. The Bumpy Point site could have held many more animals than were present (Table 32).

Table 32.--Selected sea lion counts: Tanaga
ADF&G No. 21

Date	Location code	Bulls	Pups	Other	Total	Source
26 May 59	1	-	-	75	175	Kenyon & Rice 1961
	2	-	-	100		
5 Apr 62 (0936-55)	3	-	-	150	150	Kenyon 1962
26 Apr 65 (1357-1412)	2	80	-	-	130	Kenyon & King 1965
	3	50	-	-		
28 Jun 79 (1300-1837) and	1	2	0	28	493	present survey
	4	8	0	8		
	3	6	0	436		
29 Jun 79 (1156-1615)	Misc	0	0	5		

Locations:

- 1 Cape Sasmik (ADF&G No. 21a).
- 2 North side of Cape Sajaka (ADF&G No. 21b).
- 3 Bumpy Point.
- 4 North side.

Delarof Islands

Ilak (2 July 1979)
(51°29'00"N 178°18'00"W)

Survey coverage - 100% with 50% by raft and 50% by ship (close) with excellent visibility. The north shore was surveyed by raft while the south shore was viewed from the ship close enough to spot any sea lions.

Sea otters - 4 pups and 39 older sea otters were seen distributed around the island.

Harbor seals - none sighted.

Sea lions - none sighted. Murie (1959) mentioned sea lions at Ilak; however, we believe he probably meant Grarnp Rock which lies about 2 km west of Ilak. Kenyon saw no sea lions here during surveys on 27 May 1959 (Kenyon and Rice 1961), 5 April 1962 (Kenyon 1962), nor 2 May 1965 (Kenyon and King 1965), and none were seen here by Day et al. (1978) in the summer of 1977.

Gramp Rock (2 July 1979)
(51°29'10"N 178°20'50"W)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - 5 pups and 118 others were seen, most in a kelp-filled bay on the eastern side of the rock.

Harbor seals - none sighted.

Sea lions - 1,705 filled most of the available space. This included 123 territorial males and some pups though no count could be made of the latter because the broken substrate hid most of them. We suspect there were relatively few pups at the time of our visit, but the overall count for Gramp Rock is probably conservative due to the difficulty of seeing animals in the center of the island. Although we made no landing, a landing could be made in the kelp-filled bay on the northeast side of the island. The rock is low and has no good vantage points; a landing would frighten off some sea lions (Table 33).

Table 33.--Selected sea lion counts: Gramp Rock
ADF&G No. 20

Date	Bulls	Pups	Other	Total	Source
26 May 59 (1205)	-	-	-	700	Kenyon & Rice 1961
2 May 65 (0935)	-	-	-	75	Kenyon & King 1965
Summer 1977	0	0	2235	2235	Day et al 1978
2 Jul 79 (1225-55)	123	present	1582	1705	present survey

Ugidak (1 July 1979)
(51°35'00"N 178°30'15"W)

Survey coverage - 100% by ship (close) with only fair visibility due to light fog.

Sea otters - Two were sighted.

Harbor seals - none sighted.

Sea lions - 254 were counted including 10 territorial males

(Table 34).

Table 34.--Selected sea lion counts: Ugidak
ADF&G No. 19

Date	Bulls	Pups	Other	Total	Source
26 May 59 (1215)	-	-	-	400	Kenyon & Rice 1961
5 Apr 62 (1330)	-	-	-	150	Kenyon 1962
2 May 65 (0840)	-	-	-	100 ^{1/}	Kenyon & King 1965
1969-72	0	0	0	0	Sekora 1973
Summer 77	0	0	0	0	Day et al 1978
1 Jul 79	10	0	244	254	present survey

^{1/} May include counts from Skagul and Tag Islands.

Tag Islands (1 July 1979)
(51°33'30"N 178°34'05"W)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - 4 pups and 20 older sea otters were seen.

Harbor seals - none sighted.

Sea lions - 1,740 were counted of which 135 bulls and 1,574 others were located on Tag Island itself and 3 bulls with 28 others were located on a smaller rock to the north. Although no pups were observed, it seems highly likely that some could have been present (Table 35).

Table 35. --Selected sea lion counts: Tag Islands
ADF&G No. 18

Date	Bulls	Pups	Other	Total	Source
26 May 59 (1210)	-	-	-	400	Kenyon & Rice 1961
5 Apr 62 (1310)	-	-	-	200	Kenyon 1962
2 May 65	0	0	0	0	Kenyon & King 1965
1969-72	-	-	-	1412	Sekora 1973
31 Jul 77	-	254	1613 ^{1/}	1867	Day et al 1978
1 Jul 79 (1310-57)	138	?	1602	1740	present survey

^{1/} Including bulls.

Skagul (1-2 July 1979)
(51°36'00"N 178°34'00"W)

Survey coverage - 50% of which 25% was by raft and 25% by ship with excellent visibility. The southern shore was surveyed by raft on 1 July and the north shore by ship on 2 July.

Sea otters - none sighted (count unreliable).

Harbor seals - none sighted (count unreliable).

Sea lions - none sighted (count reliable) (Table 36).

Table 36.--Selected sea lion counts: Skagul (rocks off South Point)
ADF&G No. 17

Date	Bulls	Pups	Other	Total	Source
26 May 59 (1210-15)	-	-	-	500	Kenyon & Rice 1961
5 Apr 62	0	0	0	0	Kenyon 1962
2 May 65	0	0	0	0	Kenyon & King 1965
1969-72	-	-	-	2	Sekora 1973
Summer 1977	0	0	1	1	Day et al 1978
1-2 Jul 79 (1430 & 1010)	0	0	0	0	present survey

Ogliuga (1-2 July 1979)
(51°36'00"N 178°40'00"W)

Survey coverage - 50% of which 25% was by raft and 25% by ship with excellent visibility. The south shore was examined by raft on 1 July and the north shore by ship on 2 July.

Sea otters - 1 sighted along the north shore (count unreliable).

Harbor seals - none sighted (count unreliable).

Sea lions - none sighted. Nor were any seen by Kenyon during surveys on 26 May 1959, 5 April 1962, and 2 May 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965). And none were seen by Day et al. (1978) in the summer of 1977.

Kavalga (1-2 July 1979)
(51°35'00"N 178°50'50"W)

Survey coverage - 65% of which 30% was by raft and 35% by ship (close) with excellent visibility. The raft was launched along the north shore to examine a sea lion haul site there. The south shore was viewed from 0.5-2 km offshore, within sighting range of sea lions, but sea otters and harbor seals may have been missed.

Sea otters - 3 pups and 30 older sea otters were seen from the raft along the north shore from our anchorage to West Point.

Harbor seals - none sighted (count unreliable).

Sea lions - 223 including 12 adult males were seen on a series of detached rocks off the western end of the island. No breeding activity was noted. The count may be conservative due to the early hour of the survey (Table 37).

Table 37.--Selected sea lion counts: Kavalga
ADF&G No. -- none

Date	Bulls	Pups	Other	Total	Source
26 May 59	0	0	0	0	Kenyon & Rice 1961
5 Apr 62	0	0	0	0	Kenyon 1962
2 May 65	0	0	0	0	Kenyon & King 1965
Summer 1977	0	0	1	1	Day et al 1978
2 Jul 79 (0800-0910)	12	0	211	233	Present survey

Gareoli (1 July 1979)
(51°49'48"N 178°47'00"W)

Survey coverage - 100% by ship (close) with good visibility (reduced by light fog). The deep waters around the island allowed very close approach.

Sea otters - Seven were sighted.

Harbor seals .- none sighted.

Sea lions - 27 were seen around the island of which 26, including 1 bull, were hauled out on some low rocks on the northeastern side of the island (Table 38).

Table 38.--Selected sea lion counts: Gareoli
ADF&G No. 16

Date	Location code	Bulls	Pups	Other	Total	Source
26 May 59	1	-	-	-	2500	Kenyon & Rice 1961
5 Apr 62 (1003-08)	2	0	0	0	0	Kenyon 1962
3 May 65	1	-	-	-	100	Kenyon & King 1965
1969-72	2	-	-	-	165	Sekora 1973
Summer 1977		0	0	19	19	Day et al 1978
1 Jul 79 (0838-1037)	2	1	0	26	27	present survey

Locations:

- 1 South shore (ADF&G No. 16a).
- 2 North shore (ADF&G No. 16b).

Unalga (1 July 1979)
(51°34'25"N 179°03'10"W)

Survey coverage - 100% of which 25% was by raft and 75% by ship (close) with excellent visibility. The south shore was examined by raft: the rest of the island by ship.

Sea otters - 8 pups and 84 older sea otters were seen, most along the south side of the island.

Harbor seals - 20 were seen, most at the southwest point.

Sea lions - 265 were seen around the island of which 54 were hauled out at Southeast Point and 183 at Southwest Point. The latter could have supported many more sea lions. No pups were seen (Table 39).

Table 39.--Selected sea lion counts: Unalga
ADF&G No. -- none

Date	Location code	Bulls	Pups	Other	Total	Source
5 Apr 62		-	-	-	500	Kenyon 1962
2 May 65 (1025)	1	-	-	-	520	Kenyon & King 1965
1969-72		0	0	0	0	Sekora 1973
Summer 1977		0	0	4	4	Day et al 1978
1 Jul 79 (1713-1805)	1 2	1 9	0 0	53 174	265	present survey
	Misc	0	0	28		

Locations:

- 1 Southeast Point
- 2 Southwest Point

Dinkum Rocks (1 July 1979)
(51°33'45"N 179°04'10"W)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - 3 pups and 11 older were counted.

Harbor seals - none sighted.

Sea lions - 154 were seen including 2 adult males. A fresh placenta was observed but no pups were seen. The sea lions were hauled out on sloping ledges and flat surfaces (Table 40).

Table 40. --Selected sea lion counts: Dinkum Rocks
ADF&G No. 14

Date	Bulls	Pups	Other	Total	Source
26 May 59 (1315)	-	-	-	350	Kenyon & Rice 1961
5 Apr 62 (1018)	-	-	-	500	Kenyon 1962
2 May 65 (1025)	-	-	-	500	Kenyon & King 1965
1969-72	0	0	0	0	Sekora 1973
Summer 77	0	0	0	0	Day et al 1978
1 Jul 79 (1640)	2	1/	152	154	present survey

1/ Fresh placenta but no pups sighted.

Ulak (2 July 1979)
(51°18'30"N 178°59'15"W)

Survey coverage - 80% by ship (close) with a raft survey of Hasgox Point. The only unsurveyed portion was east of Tanadak and north to Pratt Cove.

Sea otters - Two were sighted off the west shore.

Harbor seals - one was seen at the north end of the island, and three were seen on the east side just north of Patten Cove.

Sea lions - 2,374 were counted of which 88, including 4 adult males, were seen near the remains of a wrecked ship (SS San Patrick which ran aground during the winter of 1964-65) 1km northeast of Hasgox Point. At Hasgox Point 204 pups, 138 adult males, and 1,944 other sea lions were seen (Table 41).

Table 41.--Selected sea lion counts: Ulak
ADF&G No. 15

Date	Location code	Bulls	Pups	Other	Total	Source
1958	1	-	-	-	15	Mathisen & Lopp 1963
26 May 59 (1235-45)	2	-	-	-	1500	Kenyon & Rice 1961
5 Apr 62 (1023-25)	2	-	-	-	550	Kenyon 1962
2 May 65 (1029)	2	-	-	-	300	Kenyon & King 1965
1969-72	2	-	-	-	1195	Sekora 1973
Summer 1977	2	48	827	3020	3895	Day et al 1978
2 Jul 77 (1607)	3	4	0	84	2374	present survey
(1625-1745)	2	138	204	1944		

Locations:

- 1 Patton Cove (ADF&G No. 15b).
- 2 South point or Hasgox Point (ADF&G No. 15a).
- 3 wreck northeast of Hasgox Point (51°19'10"N, 178°58'00"W).

Tanadak (2 July 1979)
(51°21'00"N 179°01'00"W)

Survey coverage - 70% by ship (close) with excellent visibility.
Only the east side was not surveyed.

Sea otters - one was seen.

Harbor seals - none sighted.

Sea lions - none sighted. Nor were any seen during Kenyon's surveys of 26 May 1959, 5 April 1962, or 2 May 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965) (Table 42).

Table 42.--Selected sea lion counts: Tanadak
ADF&G No. -- none

Date	Bulls	Pups	Other	Total	Source
Summer 1977	0	0	1	1	Day et al 1978
2 Jul 79 (2026-33)	0	0	0	0	Present survey

Amatignak (2 July 1979)
(51°18'10"N 179°05'50"W)

Survey coverage - 100% by ship (close) with excellent visibility.

Sea otters - none sighted.

Harbor seals - none sighted.

Sea lions - 128 counted at four locations: 75 on a large rock off the north side; 32 at Knob Point; and 19 on either side of Nitrof Point. No pups were sighted (Table 43).

Table 43.--Selected sea lion counts: Amatignak
ADF&G No. 13

Date	Location code	Bulls	Pups	Other	Total	Source
26 May 59	1	-	-	200	250	Kenyon & Rice 1961
	2	-	-	50		
5 Apr 62 (1050-55)	3	0	0	0	0	Kenyon 1962
2 May 65 (1050-1103)		0	0	0	0	Kenyon & King 1965
1969-72	1	0	0	1	1	Sekora 1973
	2	0	0	0		
Summer 1977		0	0	370	370	Day et al 1978
2 Jul 79 (1802-2008)	4	2	0	73	128	Present survey
	2	3	0	29		
	1	1	0	18		
	Misc	1	0	1		

Locations:

- 1 Nitrof Point (ADF&G No. 13a).
- 2 Knob Point (ADF&G No. 13b).
- 3 Knob Point to west side only.
- 4 North Point.

Rat Islands

Semisopochnoi (3 July 1979)
(51°57'55"N 179°46'30"E)

Survey coverage - 100% of which 35% was by raft and 65% by ship (close) with excellent visibility. The raft survey covered the shoreline from Pochnoi Point northwestwardly to North Point.

Sea otters - 147 were counted around the island of which 5 pups and 120 older sea otters were seen in an open kelp-covered bay on the northeastern side of the island halfway between Pochnoi and Petrel Points.

Harbor seals - 16 were sighted of which 12 were hauled out near the waterfall at Petrel Point and 4 on rocks off the western point of the island.

Sea lions -- 581 were counted of which all but 7 were on two sites. At Pochnoi Point, on flat or sloping rock ledges, 25 pups, 41 bulls, and 435 others were seen. At North Point 5 bulls and 68 others were seen with no pups and no evident breeding activity (Table 44).

Table 44. --Selected sea lion counts: Semisopchnoi
ADF&G No. 12

Date	Location code	Bulls	Pups	Other	Total	Source
1936-38		-	-	-	present	Murie 1959
1957	(1?)	-	-	-	775	Mathisen & Lopp 1963
1958	2	-	-	-	75	Mathisen & Lopp 1963
26 May 59	1	-	-	400	3700	Kenyon & Rice 1961
(1345-1450)	2	-	-	2600 ^{1/}		
	3	-	-	700		
3 May 65	1	-	-	300 ^{2/}	1100	Kenyon & King 1965
	2	-	-	700 ^{2/}		
	4	-	-	100		
1969-72	2	-	-	1120	1170	Sekora 1973
	5	-	-	50		
Summer 1977		-	present	-	1223	Day et al 1978
3 Jul 79	2	41	25	435	581	present survey
(0920-1335)	5	5	0	68		
	Misc	1	0	6		

Locations:

- 1 Rocks off southwest shore (ADF&G No. 12a).
- 2 Pochnoi Point (ADF&G No. 12b).
- 3 2.7 km west of Petrel Point.
- 4 Between Tuman and Petrel Points.
- 5 North Point (ADF&G No. 12c).

1/ In four groups.

2/ In two groups.

Amchitka (3-6 July 1979)
(51°32'30"N 178°49'39"E)

Survey coverage - 48% of which 12% was by raft and 36% by ship with fair to good visibility. The survey was severely restricted by fog. On 3 July a raft survey was made of the East Cape from Omega Point to Ivakin Point. On 5 July most of the north side was surveyed from the ship. On 6 July Column Pocks was surveyed by raft.

Sea otters - 30 pups and 233 older sea otters were counted around the island, most of which (24 pups and 144 older otters) were seen near the East Cape.

Sea lions - 3,157 were counted around the island. Three haul sites were located at the eastern end of the island: one just east of Omega Point with 169 animals; one at East Cape with 638 animals; and one at Ivakin Point with 266. No breeding activity was noted at any of these sites. Column Pocks, 3.5 km southsouthwest of Buoy Point was the major rookery with 135 pups, 194 bulls, and 1,749 others (Table 45).

Table 45. --Selected sea lion counts: Amchitka
ADF&G No. 11

Date	Location code	Bulls	Pups	Other	Total	Source
19 May 59	1	-	-	50	1250	Kenyon & Rice 1961
	2	-	-	50		
	3	-	-	300		
	4	-	-	200		
	5	-	-	50		
	6	-	-	600		
29 Mar 62 & 5 Apr 62	1	-	-	30	4100	Kenyon 1962
	2	-	-	30		
	3	-	-	400		
	4	-	-	25		
	5	-	-	100		
	9	-	-	1515		
	7	-	-	0		
	8	-	-	2000		
29 Mar 62 & 5-10 Apr 62		-	-	-	3584	Abegglen 1977
2 May 65 (1130-1305)	1	-	-	0	710	Kenyon & King 1965
	2	-	-	10		
	3	-	-	300		
	4	-	-	200		
	5	-	-	0		
	6	-	-	175		
	7	-	-	0		
	8	-	-	0		
	9	-	-	25		
1969-72		-	-	-	750	Sekora 1973
3 - 6 Jul 79	1	-	-	-	3157	present survey
	2	-	-	-		
	3	11	0	255		
	4	18	0	621		
	5	-	-	-		
	10	194	135	1749		
	7	7	0	162		
	Misc	0	0	5		

Locations:

- 1 Bird Rock (ADF&G No. 11a).
- 2 Islet off Chitka Point (ADF&G No. 11b).
- 3 Ivakin Point (ADF&G No. 11c).
- 4 East Cape (ADF&G No. 11d).
- 5 St. Makarius Islet (ADF&G No. 11e).
- 6 Southwest Islets and rocks (ADF&G No. 11f).
- 7 Omega Point (ADF&G No. 11g)
- 8 East of Omega Point (ADF&G No. 11h)
- 9 3.6 km northwest of Column Rocks (ADF&G No. 11f).
- 10 column Rocks (ADF&G No. 11f)

Little Sitkin (6-7 July 1979)
(51°59'40"N 178°30'00"E)

Survey coverage - 100% by ship (close) with good visibility.
The northern shore was examined on 6 July and, after the fog cleared, the south shore on 7 July.

Sea otters - 15 were seen evenly distributed around the island.

Harbor seals - none sighted.

Sea lions - 122 were counted on an islet at Patterson Point on the north side of Little Sitkin. This apparently was a nonbreeding site (Table 46).

Table 46. --Selected sea lion counts: Little Sitkin (Patterson Point)
ADF&G No. 9

Date	Bulls	Pups	Other	Total	Ssource
19 May 59 (1028-40)	0	0	0	0	Kenyon 1959
29 Mar 62 (1356)	0	0	0	0	Kenyon 1962
3 May 65	-	-	-	15	Kenyon & King 1965
1969-72	-	-	-	335	Sekora 1973
6 Jul 79	18	0	104	122	present survey

Davidof and Pyramid Islands (7 July 1979)
(51°58'00"N 179°20'00"E)

Survey coverage - 100% by raft with excellent visibility.
Sea otters- 9 pups and 85 older sea otters were found distributed around the islands. Of these, 2 pups and 26 older were hauled out on rocks. It is possible that prevailing foggy conditions following the previous day's high winds and storm conditions account for this hauling out behavior.

Harbor seals- 10 pups and 34 other seals were seen.

Sea lions - none were hauled out but two were seen in the water off Pyramid Island. Kenyon saw no sea lions here during surveys of 19 May 1959, 29 March 1962, and 3 May 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965). Early et al. (1980) reported one sighting near Davidof and two sea lions near Pyramid on 24 July 1979.

Khvostof (7 July 1979)
(51°59'00"N 179°23'00"E)

Survey coverage - 100% by raft with good to excellent visibility.
Light fog enveloped parts of the island and thick beds of kelp between Khvostof and Pyramid made a close approach to the island difficult.

Sea otters - 18 pups and 92 older sea otters were seen in the kelp along the eastern shore and around the northern end of the island.

Harbor seals - none sighted. Kelp prevented a close approach to shore along some of the coast.

Sea lions - none sighted. Kenyon saw no sea lions here during surveys on 19 May 1959, 29 March 1962, and 3 May 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965). Nor were any seen by Early et al. (1980) on 24 July 1979.

Segula (7 July 1979)
(52°00'00"N 178°06'30"E)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - 16 pups and 75 older were seen around the island with most along the east and south shores from Gula Point to Chugul Point where 13 pups and 47 older sea otters were counted. Gula Point to Chugul Point up to the north and west shores 3 pups and 28 older were seen.

Harbor seals - seven were sighted.

Sea lions - 131 were seen around the island of which 29 bulls and 31 others were counted at Gula Point. At Chugul Point 3 bulls and 63 others were seen. No pups or breeding activities were noted. One sea lion had the remains of a net around its neck (Table 47).

Table 47. --Selected sea lion counts: Segula
ADF&G No. 8

Date	Location code	Bulls	Pups	Other	Total	Source
1936-38		-	-	-	present	Murie 1959
19 May 59 (1112-17)		-	-	-	0	Kenyon & Rice 1961
29 Mar 62 (1220)	2	-	-	100	100	Kenyon 1962
3 May 65 (1144-52)	1 2	- -	- -	50 600	650	Kenyon & King 1965
1969-72	1 2	- -	- -	133 115	248	Sekora 1973
24 Jul 79	1 2 Misc	34 - -	- - -	28 34 6	102	Early et al 1980
7 Jul 79 (1340-1515)	1 2 Misc	29 3 0	0 0 0	31 63 5	131	present survey

Locations:

- 1 Gula Point (ADF&G No. 8a).
2 Chugul Point (ADF&G No. 8b).

Ayugadak (7 and 10 July 1979)
(51°45'45"N 178°24'30"E)

Survey coverage - 100% by raft with poor visibility on 7 July when the north side was viewed and excellent visibility on 10 July when the south side was viewed.

Sea otters - 12 pups and 105 older were sighted between the two surveys. All were in kelp beds around the island.

Harbor seals - none sighted.

Sea lions - 1,485 were counted. Although only 22 pups were sighted, this site should be considered a major rookery (Table 48).

Table 48.--Selected sea lion counts: Ayugadak (eastern point)
ADF&G No. 10

Date	Bulls	Pups	Other	Total	Source
1958	-	-	-	200	Mathisen & Lopp 1963
19 May 59 (1045-55)	-	-	-	600	Kenyon 1959
29 May 62 (1208)	-	-	-	1005	Kenyon 1962
2 May 65	-	-	-	400	Kenyon & King 1965
1969-72	-	-	-	305	Sekora 1973
7 & 10 Jul 79 (1755-1910 & 1625)	98	22	1365	1485	present survey

Rat Island (7 and 10 July 1965)
(51°46'25"N 178°16'50"E)

Survey coverage - 60% by ship (close) with excellent visibility on both 7 and 10 July. Unnamed rocks on the south side of Rat Island (51°46'25"N 178°16'50"E), which we refer to here as "Rugh Rocks" and "Burdine Ledge," were surveyed by raft on 10 July.

Sea otters - 5 pups and 97 older sea otters were seen on 7 July along the north shore. The pup count is considered low. On 10 July the vessel traversed a portion of the southern shore, though some distance away and sighted 46 sea otters.

Harbor seals - none sighted.

Sea lions - 73 including 12 bulls were counted on Rugh Rocks and Burdine Ledge (Table 49).

Table 49.--Selected sea lion counts: Rat Island
ADF&G No. - none^{1/}

Date	Bulls	Pups	Other	Total	Source
19 May 59 (1045-55)	-	-	-	150	Kenyon 1959
29 May 62 (1408-20)	-	-	-	250	Kenyon 1962
3 May 65 (1408-20)	-	-	-	250	Kenyon & King 1965
7 & 10 Jul 79 (1700-55 & 1450-1515)	12	0	61	73	present survey

^{1/} See Ayugadak.

Sea Lion Rock (7 and 10 July 1979)
(51°52'55"N 177°59'00"E)

Survey coverage - 100% by raft with excellent visibility on 10 July.
The 7 July visit was by ship alone with poor visibility.

Sea otters - 15 pups and 54 older sea otters were seen.

Harbor seals - none sighted.

Sea lions - 81 including 3 territorial bulls were counted on 10 July.
On 7 July only 13 sea lions were seen under poor viewing
conditions (Table 50).

Table 50 .--Selected sea lion counts: Sea Lion Rock (Kiska)
ADF&G No. 6

Date	Bulls	Pups	Other	Total	Source
1958	-	-	-	100	Mathisen & Lopp 1963
2 May 65	-	-	-	0	Kenyon & King 1965
10 Jul 79 (1305)	3	0	78	81	present survey

Tanadak (9 July 1979)
(51°57'00"N 177°47'25"E)

Survey coverage - 100% by raft with excellent visibility.

Sea otters - 8 pups and 51 older sea otters, 4 of which were hauled out
on rocks.

Harbor seals - Four were sighted.

Sea lions - 264 including 9 bulls were counted at several locations
around the island. No breeding activity was noted (Table 51).

Table 51 .--Selected sea lion counts: Tanadak
ADF&G No. 7

Date	Bulls	Pups	Others	Total	Source
19 May 59	-	-	-	50	Kenyon & Rice 1961
29 Mar 62 (1239)	-	-	-	0	Kenyon 1962
2 May 65	-	-	-	0	Kenyon & King 1965
12 Aug 1978	-	present	-	670	Day et al 1979
9 Jul 79 (1400-1500)	9	0	255	264	present survey

Little Kiska (9 July 1979)
 (51°58'40"N 177°38'40"E)

Survey coverage - 5% by ship (close) near Little Kiska Head and vicinity. Fog obscured the rest of the island.

Sea otters - Two were sighted northeast of Little Kiska Head while we waited for the fog to lift.

Harbor seals - none sighted (count unreliable).

Sea lions - none sighted. Nor were any seen by Kenyon on 19 May 1959, 29 March 1962, 2 May 1965 (Kenyon and Rice 1961; Kenyon 1962; Kenyon and King 1965).

Kiska (8-10 July 1979)
 (51°57'55"N 177°20'40"E)

Survey coverage - 40% of which 17% was by raft and 23% by ship (close) with visibility poor to excellent. Heavy fog shrouded Kiska throughout our survey. We waited at sites of known sea lion haul outs until the fog lifted enough to allow a survey by raft. Areas we considered adequately surveyed included Kiska Harbor, Sobaka Rocks and the south tip of Vega Point, Cape St. Stephen, 7.5 km of shore north of Lief Cove, and the north end of the island from Vulcan Point east to Haycock Rock.

Sea otters - 14 pups and 201 older otter were seen around the island. From Lief Cove and north, 7 pups and 31 older otter were seen. Near Cape St. Stephen, 1 pup and 105 older otter were seen. Near Haycock Rock and Northeast Rocks, 1 pup and 7 older otter were counted. The pup count was probably conservative.

Harbor seals - One pup and nine others were seen.

Sea lions - 8,378 were seen around the island. Most (476 pups, 213 bulls, and 4,953 others) were found in a series of four coves north of Lief Cove. The beaches of these coves were relatively narrow and were principally composed of coarse gravel and cobblestone interspersed with boulders and rock ledges. This site was first reported as a rookery by personnel of the Aleutian Island National Wildlife Refuge, U. S. Fish and Wildlife Service. Kenyon and King (1965) found only 150 animals here on 2 May 1965. The Cape St. Stephen rookery, containing 137 pups, 172 bulls, and 2,339 others, was located at the southwestern end of Kiska on a series of rock ledges extending to the eastward with easy access to the sea.

At Sobaka Rock only 15 bulls and 35 others were counted. No breeding activity was noted.

At Wolf Point 26 sea lions were hauled out, and 12 other sea lions were seen at various other locations around Kiska, but we feel that all major haul sites were examined (Table 52).

Table 52.--Selected sea lion counts: Kiska
ADF&G No. 6

Date	Location	Bulls	Pups	Other	Total	Source
1958	3	-	-	150	150	Mathisen & Lopp 1963
19 May 1959 (1158-1230)	2 3	- -	- -	1000 400	1400	Kenyon & Rice 1961
29 Mar 62 (1231-1324)	2 3 6	- - -	- - -	600 200 100	900	Kenyon 1962
2 May 65 (1405-1528)	2 3 4 5 7	- - - - -	- - - - -	800 235 250 150 50	1485	Kenyon & King 1965
1969-72	4	-	-	-	65	Sekora 1973
9-11 Aug 78	2	-	present	1350	6066	Day et al 1979
9-11 Aug 78	3	-	present	930		
26 Jul 78	4	-	0	22		
9-11 Aug 78	5	-	present	3750		
26 Jul 78	8	-	0	14		
8 Jul 79 (1635-1810)	2	172	137	2339	8378	present survey
8 Jul 79 (0930-1015)	3	15	0	35		
9 Jul 79 (0940-1115)	4	2	0	0		
8 Jul 79 (1330-1620)	5	213	476	4953		
9 Jul 79 (0925-36)	8	8	0	18		
	Misc.	0	0	10		

Locations:

- 1 Sea Lion Rock (ADF&G No. 6a).
- 2 Cape St. Stephen (ADF&G No. 6b).
- 3 Vega Point (ADF&G No. 6c) including Sobaka and neighboring rocks.
- 4 Sirius Point (ADF&G No. 6d).
- 5 North of Lief Cove (ADF&G No. 6e).
- 6 Vulcan Point.
- 7 Northeast Point.
- 8 Wolf Point.

Pillar Rock (9 July 1979)
(52°08'10"N 177°22'30"E

Survey coverage - 100% by ship (close) with excellent visibility.

Sea otters - none sighted.

Harbor seals - none sighted.

Sea lions - 35 were hauled out on a small shelf. Pillar Rock is probably used by a few sea lions during most seasons of the year. This site was not listed in the ADF&G catalog.

DISCUSSION

Sea Lions

Sea lion counts and respective data on time of observation, location, and survey platform are reported in Appendix II. Sea lions were categorized as bulls (adult territorial males), pups (young of the year), and others (females and subadult males) because these categories were generally apparent from our viewing platforms.

We visited only Bogoslof and Fire Island of the Fox Island group where we counted a total of 2,381 sea lions (all but 4 were on Bogoslof). This total is comparable to the Braham et al. (1980) count of 2,328 in June 1977 but only 42% of the 5,638 counted in June 1973 by Byrd et al. (1980). Our count of 147 bulls and 914 pups is far below the 900 bulls and 2,328 pups counted by Byrd et al. (1980).

We counted a total of 3,929 sea lions on the Islands of Four Mountains. The only major rookery in this island group was on the northeast shore of Yunaska near Lava Flow where we found 48 bulls, 187 pups, and 1,360 others. Pups were also seen but in low numbers at Chuginadak and Amukta. Except for the Yunaska rookery, the remainder of, the islands in this group contain nonreproductive haul sites with the largest at Concord Point at Chuginadak where 913 sea lions (including 3 pups) were counted.

The Andreanof Islands contained the largest number of sea lions counted in this survey (18,869) and contained two major rookeries, one at Saddleridge Point on Seguam, which was the largest rookery encountered, and the other at Kasatochi. Pups were also present at Agligadak, Sagigik, and Adak, but in low numbers. Sea lions were not seen by us on haul sites at Amtagis, Salt Island, Igitkin, or Bobrof even though as many as 2,000, 800, 700, and 100, respectively, had been seen on these islands in the past (Kenyon 1962; Kenyon and King 1965). At two islands, Sagchudak and Koniuji, our counts were much lower than historical counts. At Sagchudak we found only 10 compared to Kenyon and Rice (1961) who reported 1,200 (see also the Sagchudak Island account in Results section). At Koniuji we counted 109 compared to 1,500 reported by Kenyon (1962). The differences in counts at these two haul sites, even though quite large, could be due to the movement of animals from haul sites before the breeding season (when the earlier counts were made) to rookeries for breeding and parturition during late April and June (when the present survey began).

Sea lions are not as numerous in the Delarof Islands as elsewhere in the Aleutians; we had a total count of only 6,870 sea lions. One major rookery was found at Hasgox Point of Ulak Island where 2,374 sea lions were counted including 138 bulls and 204 pups. Pups were also seen or probably occurred at Gramp Rock and Tag Islands, but in low numbers. The low rocks and broken substrate at Gramp Rock and Tag prohibited proper viewing and more pups may have been present than seen. We did not see any sea lions at Skag-ul Islands

compared to 500 reported there by Kenyon and Rice (1961). At Kavalga, where sea lions were not previously reported, we counted 233, including 12 bulls and 211 others. As expected, no sea lions were seen at Ilak, Ogliuga and Tanadak. At Gareoli, we counted only 27 sea lions compared to 2,500 reported by Kenyon and Rice (1961). Gareoli may be a winter/spring haul-site which is essentially vacated by sea lions during the breeding season.

In the Rat Islands, we counted 14,309 sea lions. This island group contains three major rookeries, two on Kiska at Lief Cove and at Cape St. Stephen, and one on Column Rocks at Amchitka. The Lief Cove rookery is a series of four coves north of Lief Cove proper and is second in size only to the Saddleridge Point rookery on Seguam of the rookeries we encountered. Of the 14,309 sea lions counted in this island group, 8,290 occurred on the two Kiska rookeries. Amchitka Island accounted for most of the remaining sea lions of the group (3,157) on the island, including 194 bulls, 135 pups, and 1,749 others at the Column Rocks rookery. Pups were also seen at Semisopochnoi (25) and Ayugadak (22). Our count at Semisopochnoi is much lower than previous accounts. At Pochnoi Point where we counted 501 (including 25 pups), Kenyon (1962) reported 2,600 total sea lions. The remaining sea lions were scattered throughout the islands or islets of the group, including Pillar Rock where none were previously reported but excluding Davidof and Pyramid Island, Khvostof, and Little Kiska where none were seen during this study.

Table 53 summarizes sea lion counts by major island groups with data cited from Braham et al. (1980) and Early et al. (1980) as these studies all occurred within relatively the same time period. Note that the highest sea lion concentrations are in the extreme east and extreme west of the Aleutians. The total count, 89,113, is undoubtedly conservative in consideration of islands unsurveyed and suboptimal census conditions at some sites.

Table 54 compares the summary of recent sea lion surveys (Table 53) to earlier surveys of the Aleutian Islands (Kenyon and Rice 1961; Kenyon and King 1965). These surveys were conducted during the nonbreeding season when fewer numbers of sea lions are hauled out. Therefore, the cumulative totals for each island group from the earlier surveys would increase by a few thousand animals if extrapolated to counts during the breeding season. The comparison in Table 54 indicates that the number of sea lions in the central and western Aleutian Islands has not markedly changed over the last 20 years, but as documented by Braham et al. (1980), there has been a significant decline in the number of sea lions in the eastern Aleutians. It is apparent from the present study that a substantial shift in distribution from the east to the west has not occurred and that the decline in the east must be caused by other factors, as discussed in Braham et al. (1980).

Major breeding and pupping rookeries are designated in Figure 10 and Table 55. Pups do occur at numerous other sites but in lower concentrations. Some islands, such as Tag and Gramp Rocks in the Delarofs, may have contained more pups than we counted, but viewing conditions prevented better counts short of sweeping the islands clear of adults, which was not done. In fact, it should be noted that pup counts generally are conservative (except in cases such as at

Saddleridge Point, Segum Island, where viewing conditions were superb). The small size and dark coloration of pups make them difficult to observe, especially among the adults and boulders on the rookeries. The distribution of major rookeries across the Aleutian Islands seems remarkably even, although counts of pups and adults both show that there are greater densities of sea lions in the far east and far west.

TABLE 53.--Summary of recent northern sea lion (Eumetopias jubatus) counts from the Aleutian Islands.^{1/}

Location	Date	Count	Source
Fox Is.	Jun 77 ^{2/}	20,912	Braham et al. 1980
Is. of Four Mtns.	Jun-Jul 79	3,929	present survey
Andreanof Is.	Jun-Jul 79	18,869	present survey
Delarof Is.	Jun-Jul 79	6,870	present survey
Rat Is.	Jun-Jul 79	14,309	present survey
Near Is.	Jun-Jul 79	<u>24,224</u>	Early et al. 1980
Total		89,113	

^{1/} Does not include 2,381 sea lions counted in the present survey from the Fox Island group.

^{2/} Where counts were not made during the June 1977 survey, maximum counts from their earlier surveys were used.

TABLE 54.--A comparison of recent northern sea lion counts (Table 53) to historical counts in the Aleutian Islands.

	1977-79	Kenyon & Rice 1961 ^{1/}	Kenyon & King 1965 ^{2/}
Fox Islands	20,912	53,740	24,120
Islands of Four Mountains	3,929	1,375	800
Andreanofs	18,869	14,170	1,095
Delarofs	6,870	6,600	14,772
Rat Islands	14,309	8,450	8,196
Near Islands	<u>24,224</u>	<u>15,410</u>	<u>9,900</u>
Total	89,113^{3/}	97,745	58,883

1/ Surveys in May 1959 and March 1960, prior to breeding season.

2/ Surveys in April-May 1965, prior to breeding season; not all areas were covered.

3/ Includes counts of 7,384 pups totalled from present survey and counts of Near Islands (Early et al. 1980).

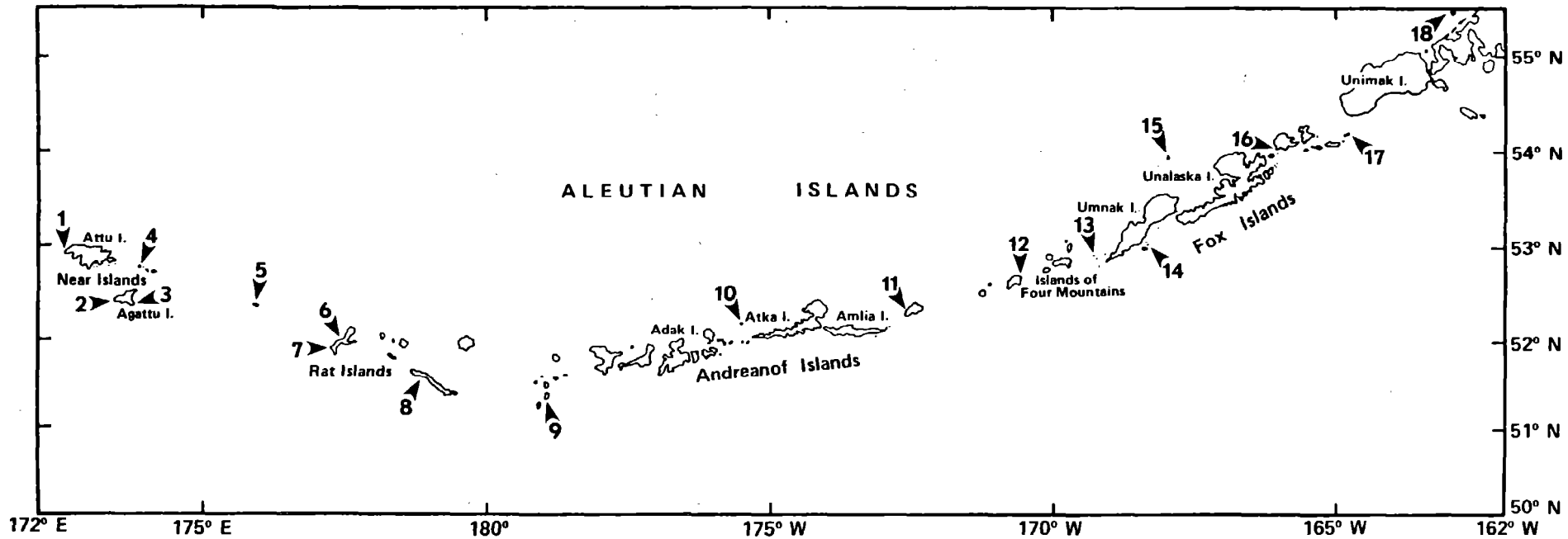


Figure 10. Major sea lion pupping and breeding rookeries in the Aleutian Islands. See Table 55 for identification of numbered sites.

TABLE 55. --Major sea lion pupping and breeding rookeries in the Aleutian Islands (see Figure 6).

Site	Sea lion counts		
	Bulls	Pups	Other
(1) Cape Wrangell, Attu ^{1/}	217	642	1,924
(2) Gillon Point, Agattu ^{1/}	125	65	631
(3) Cape Sabak, Agattu ^{1/}	125	118	6,269
(4) NE side Alaid Head, Alaid ^{1/}	40	100	585
(5) NW point and rocks, Buldir ^{1/}	430	985	2,707
(6) N of Lief Cove, Kiska	213	476	4,953
(7) Cape St. Stephen, Kiska	172	137	2,339
(8) Column Rocks, Amchitka	194	135	1,749
(9) Hasgox Point, Ulak	138	204	1,944
(10) Kasatochi	79	213	1,874
(11) Saddleridge Point, Seguam	147	2,407	3,367
(12) Northeast shore, Yunaska	96	752	1,360
(13) Adugak ^{2/}	-	98	1,842
(14) Ogchul ^{2/}	-	140	1,130
(15) Bogoslof	147	914	1,316
(16) Cape Morgan, Akutan ^{2/}	-	-	2,967
(17) Ugamak (incl Round I.) ^{2/}	-	871	5,408
(18) Sea Lion Rock, Amak ^{2/}	-	-	2,130

1/ Data from Early et al. (1980) collected in June and July 1979.

2, Data from Braham et al. (1980) collected in June 1977 except for pup counts of Adugak and Ogchul, which came from land-based studies made in October 1976 (Fiscus et al. 1976), and except for pup counts of Ugamak made in June-July 1977 for parts of the island (D. Withrow, pers. commun.). Cape Morgan and Sea Lion Rock have high concentrations of pups but reasonable counts were not possible from aircraft.

Harbor Seals

Harbor seals sighted during the present survey are listed in Appendix III, and specific locations are described under the individual island accounts. Our seal counts are most certainly low, especially for the larger islands, as this survey was not designed to maximize harbor seal observations. Highest counts might be obtained during the molting period in August-October (Pitcher and Calkins 1977) and during periods of low tides (Everitt and Braham 1980); but more significantly, most shorelines were not examined closely enough to detect all harbor seals.

All islands in the Islands of Four Mountains group were surveyed by raft or at close range by ship, and we feel that we obtained our best harbor seal counts here. The total count for this island group was 239, ranging from 4 at Uliaga to 91 at Kagamil. The number (19) sighted at Yunaska was surprisingly low but may have been a function of poor visibility due to fog, rain, and choppy seas. Sekora (1973) cited a letter from K. W. Kenyon (Bureau of Sports Fisheries and Wildlife) to the Aleutian Islands Refuge supervisor, D. Spencer (also of BSFW), dated 8 December 1964, in which Kenyon estimates 1,000 harbor seals for the Islands of Four Mountains. This seems a more reasonable estimate than our total count of 239.

In the Andreanof Islands we counted 309 harbor seals; however, large portions of the major islands of the group were viewed from the ship and much suitable harbor seal habitat was left unsurveyed. Where island counts can be compared to previous records, considerable differences occur, for example: present survey/Kenyon and King (1965) showed 4/14 for Seguam; 2/20 for Amlia; and 1/26 for Atka. The present survey compared to Day et al. (1978) for Bobrof showed a difference of 0/17. Sekora (1973) estimated there were 7,000 harbor seals in the Andreanof Islands.

We counted only 24 seals in the Delarof Islands. Day et al. (1978) carried out raft surveys of the group during the summer of 1977. Where we found 20 seals at Unalga and 4 at Ulak, they found 1 and 2 respectively. Where we found no seals on Skagul, Ogliuga, and Kavalga, they found 101, 25, and 9 respectively, and Kenyon and King (1965) counted 100, 25, and 20 for these same islands. Sekora (1973) estimated there were 1,000 seals in all of the Delarofs.

In the Rat Islands we saw 96 harbor seals. At Semisopchnoi we counted 16 compared to 70 by Kenyon and King (1965) and 265 by Day et al. (1978). At Amchitka our count was severely hampered by fog, and the 15 we saw there cannot be compared to the 215 seen by Kenyon and King (1965) and the 1,200 estimated in 1964 by Kenyon (in Sekora 1973). Abegglen (1977) placed the Amchitka population at 900 to 1,000 animals in 1971. We were severely hampered by fog in the Kiska and Little Kiska vicinity, and as our survey efforts were directed specifically at sea lion haul sites, our count of 10 is inadequate. However, Day et al. (1979) made raft surveys of these islands in late July and early August in 1978 and counted 439 adult and 30 pup seals

on Kiska and 287 adult and 16 pups at Little Kiska. Where we saw only 4 seals on Tanadak, Day's party counted 105. Where we counted no seals on Khvostof, Early et al. (1980) saw 17 when they surveyed on 24 July, 15 days after we did. Our count for Davidof and Pyramid was 44 while Early et al. (1980) saw 46. Sekora (1973) estimated a total of 2,800 in the Bat Island population.

Our total for the central Aleutians, then, was 15 pups and 659 older harbor seals. Murie (1959) reported harbor seals throughout the Aleutians although not particularly abundant during the 1936-38 surveys. Sekora (1973) estimated a population of 11,800 for the central Aleutian Islands from Kenyon's counts. Estimates of harbor seal numbers in the Aleutians provided by the State of Alaska for the Final Environmental Impact Statement (NMFS 1978) was 85,000, and they conclude that the population is at or near maximum numbers (no subdivision by island group was provided). Because counts of harbor seals are highly dependent on viewing conditions, tide height, and season, we feel our results greatly underestimate the true population. It was apparent, however, that harbor seals were present throughout most of the survey area, scarce in the Delarofs and most of the Bat Islands, and nowhere abundant.

Sea Otters

Sea otters sighted during the present survey are listed in Appendix III, and locations are described in the individual island accounts. The results of aerial and surface surveys in the Aleutian Islands through 1967 are described by Kenyon (1969). Abegglen (1977) summarizes otter exploitation and research in the Aleutians through 1974 with particular emphasis on Amchitka. Estimates of otter populations in Alaska provided principally by Karl Schneider (ADF&G) through 1977 are listed in the Final Environmental Impact Statement (NMFS 1978). Personnel of the Aleutian Islands National Wildlife Refuge System (USFWS) and the National Wildlife Laboratory (USFWS) are continuing surveys and research programs on this species in the Aleutian Islands. Personnel of the Alaska Department of Fish and Game have been involved in otter research in the past and share a continuing interest in the species in this region. Otter observations made during the present survey have been made available to these organizations and will only be briefly commented on here. Table 56 summarizes the historical records of sea otter counts from 1965 (Kenyon 1969), 1973 (Sekora 1973; which is probably derived, at least in part, from Schneider 1969), and 1977 (NMFS 1978).

TABLE 56. Historical records of sea otter counts from the Aleutian Islands. The 1965 counts are from Kenyon (1969), those of 1973 are from Sekora (1973), and those of 1977 are from NMFS (1978).

Island group	Year of estimate		
	1965	1973	1977
Fox Islands	3,913	300	600-1,200
Is. of Four Mountains	0	0 ^{1/}	few
Andreanof Islands	7,760	36-38,000	32-40,000
Delarof Islands	871	-	-
Delarof and Rat Is.	-	23-32,000	23-32,000
Rat Islands	4,196	-	-
Near Islands	45	100	500

^{1/} Sekora (1973) reports the first sighting in 1969 but saw none during his 1972 survey.

We examined all of the Islands of Four Mountains from rafts except for Carlisle which was 87% surveyed by ship at close range and the west side of Herbert which was observed from the ship under difficult viewing conditions. Also, portions (8%) of the southwest end of Chuginadak were unsurveyed. Because almost no otters had previously been reported from these islands, particular attention was made to examine potential habitat. Kenyon (1969) states that the available sea otter habitat was small here, only 22,800 hectares (88 sq miles). As indicated in Table 56, no sea otters were seen here during Kenyon's surveys of 1960, 1962, or 1965. Sekora reported one sighting in 1969 but did not give its location, and he did not see any in 1972. A "few" were listed in this island group in 1977 (NMFS 1978), presumably based on ADF&G records or the Sekora report. We sighted sea otters at five of these eight islands during our surveys of 18-19 June and 13 July 1979 (8 pups and 65 older otter). The greatest numbers seen were at Chuginadak (6 pups and 25 older otter) and at Yunaska (2 pups and 19 older otter). Although Yunaska was surveyed by raft, viewing conditions ranged from poor to fair, and it is likely that some sea otters were missed.

Our counts in the Andreanof Islands were 112 pups and 1,313 older otters. Most of these islands were inadequately surveyed for sea otters as large areas of coastline were approached only close enough to sight sea lions. Sites of known sea lion concentrations were visited while much of the rest of the island's shores may have been unexamined. Kenyon (1969) reported no otter at Koniuji or Kasatochi in 1959 and 1962 (he did not survey these islands in 1965). He reported minimal suitable sea otter habitat at either island. During our surveys we found 1 pup and 5 older sea otters at Koniuji and 4 pups with 9 older sea otters at Kasatochi.

In the Delarof Islands we found 27 pups and 315 older sea otters, a count we consider very low because, as in the Andreanof Islands, our surveys did not cover the island shorelines adequately for good sea otter counts. Where we did survey close to the shore, such as at Gareoli, we found 7 otter without pups compared to Day et al. (1978) who saw 26 pups and 100 older sea otters in 1977. This discrepancy may be explained by a die off or migration or by differences in survey techniques. Kenyon (1969) saw 111 otter at Gareoli in 1965, remarkably similar to the count by Day's party. Our sightings at Ilak and Gramp Bock, 166 sea otters, compares favorably with Day's 137.

Our total count from the Bat Islands was 132 pups and 1,198 older sea otters. Interesting comparisons in counts can be made for Segula: in 1959 Kenyon and Rice (1961) observed 47 sea otters; in 1965 Kenyon and King (1965) saw 56; our survey of 7 July 1979 totaled 16 pups and 75 older sea otters while Early et al. (1980) reported 22 pups and 76 older sea otters 17 days later. Similar comparisons for Khvostof, Pyramid, and Davidof show a count of 33 in 1959, 36 in 1965, 204 during our survey of 7 July 1979 and 164 sighted by Early et al. on 24 July 1979. Where we saw 18 pups and 92 older sea otters at Khvostof, Early's party saw 28 pups and 61 older otter; where we saw 9 pups and 85 others at Pyramid and Davidof, Early's party saw 27 pups and 48 older sea otters. Similar to the harbor seal counts, our sea otter census greatly underestimates the number present except for those islands where we surveyed shorelines by raft or very close with the ship. Therefore our summary counts cannot be compared to those from other surveys, although specific site comparisons can be made.

Fur Seals

Fur seal sightings are listed in Appendix IV. No fur seals were observed hauled out on land during our survey in the central Aleutians and only four animals were sighted at sea. Two animals were observed ashore on Bogoslof in the eastern Aleutians (Fox Island group) and one at sea east of Bogoslof. Murie (1959) and Sekora (1973) summarize on-land records from the Aleutian Islands. Early et al. (1980) reported finding 12 dead fur seals on the beach in North Bight, Buldir, on 14 June 1979.

Some fur seals are found at sea near the Aleutian Islands during all seasons of the year. The sea around the Fox Islands is a part of the summer range of the Pribilof Island seals. They are generally found in considerable numbers from Unimak Pass westward to Bogoslof from July through August. The National Marine Mammal Laboratory has records of fur seals hauled out or found in the immediate vicinity of sea lion haul sites on Amak, Ugamak, Akutan, and Bogoslof. Seals at Ugamak were observed to haul out and remain ashore for one to five hours before returning to sea (D. Withrow, pers. commun. 1980). Fiscus (1972) surveyed the pelagic sealing ground south of the western Aleutians in May and June of 1971. From his observations and through reviews of

other reports, he states that these seals are most numerous in that area in May and June but that at least a few are present there during most months of the year. On 11 June 1971 he sighted 16 fur seals south of Yunaska. All of the Aleutian Island passes may be used by fur seals during the spring and fall migration, although the larger passes are probably favored.

To the best of our knowledge, there have been no fur seals sighted hauled out in the central Aleutian Islands; however, with increased observation effort, it would not be surprising to find occasional records. The three islands from which there are frequent reports of hauled out fur seals Bogoslof, Samalga, and Buldir - are some of the most isolated of the eastern and western Aleutian Islands and, accordingly, may provide these animals with sites of minimal disturbance.

Cetaceans

Cetacean sightings are listed in Appendix V. Although watches were maintained during most daylight hours when underway between islands, our records may underestimate the number of cetaceans present because of our emphasis on surveying very close to the shore and because frequently the transits between islands were made in the dark to increase our daylight effort at sea lion haul sites. Of the six species sighted, by far the most common was the Dali's porpoise. This could, of course, have been biased by their bow riding behavior which tends to increase the chances of sightings while other cetaceans may have the opposite bias if they avoid the ships.

Of the 34 times minke whales were sighted, 29 appeared to be single animals. The remainder were in groups of twos (2), threes (2), and four (1). In most cases identifications were unequivocal as we were free to deviate from the trackline to approach questionable sightings. The frequency of these sightings suggests either that minke whales were relatively common in the Aleutians or that they had a preference for being in nearshore areas where our surveys were concentrated. Table 57 shows that most sightings occurred near Amlia in the Andreanof Islands, perhaps a function of preferred food resources in these areas. Of particular note was a sighting on 23 June off Agligadak in Seguam Pass when we came upon a group of approximately 27 killer whales including 6 adult males and 5 calves which we followed for 25 minutes. Two minke whales were seen with the killer whales, yet there was no evidence of aggressive activity or attacks on the part of the latter. The frequent turns and fast blow sequences suggested that both species were actively feeding on something in common such as a school of fish or that both had found resources that coincided at the same location.

One fin whale was seen on 15 July north of Unalaska Island. Three other sightings may have been fin whales but no distinct features were recognized. These three sightings were just west of Atka on 11 July.

On 8 occasions pods of killer whales were sighted varying in numbers from 2 to 27 per pod with a total count of 63 whales. No close association between the killer whales and sea lion haul sites was evident, and there is no strong pattern in their distribution across the Aleutian Islands (Table 57).

Two groups of harbor porpoises were seen containing 4 and 12 animals each. These were found near the shores of Great Sitkin Island.

Dali's porpoises, the most frequently sighted cetacean, were observed on 97 occasions and totaled 470 animals ranging in pod size from 1 to 29 animals. Because these porpoise frequently approach vessels and ride their bow waves, Dali's porpoise counts may be high relative to that of other cetaceans. No strong pattern is evident in their distribution other than a depression in density of sightings in the area around the Islands of Four Mountains (Table 57). Notes were kept on the presence or absence of white tips on Dali's porpoise's dorsal fins and flukes following 5 July for purpose of documenting potentially taxonomic patterns. None are evident in this data set other than that most of the Dali's porpoise sighted did bear the white marks.

Pods of beaked whales (Mesoplodon spp.) were sighted on seven different occasions. Their group sizes ranged from 3 to 15, and totaled up to 52 animals, assuming no replication between sightings. Some of the seven unidentified whales may have also been beaked whales. All of the beaked whale sightings came from waters near the Andreanof Islands except the seven seen on 3 July (Rat Islands) and the four on 14 July (Fox Islands). The Andreanof sightings include two beached carcasses found in Cable Bay, Tanaga Bay, located on the west side of Tanaga Island. Measurements of these two specimens were taken and some skeletal material was recovered. These Mesoplodon sightings and measurements of stranded specimens will appear in a separate paper.

TABLE 57.--Distribution of cetaceans in the central Aleutian Islands
as a function of survey effort 17 June - 15 July 1979.

Longitude	Survey time(hr)	Minke sightings	Corrected count ^{1/}	Killer whale sightings	Corrected count ^{1/}	Dall's porpoise sightings	Corrected count ^{1/}	Beaked whale sightings	Corrected count ^{1/}
166°-167°W	2.83	9	3.18	0	-	25	8.83	0	-
167°	2.75	0	-	6	2.18	18	6.55	0	-
168°	12.00	0	-	0	-	12	1.00	4	.33
169°	20.49	0	-	0	-	6	.29	0	-
170°	8.39	0	-	0	-	1	.12	0	-
171°	12.29	0	-	2	.16	4	.33	0	-
172°	30.00	2	.07	0	-	0	-	0	-
173°	15.66	8	.51	30	1.92	40	2.55	0	-
174°	14.87	9	.61	0	-	38	2.56	0	-
175°	22.08	2	.09	7	.32	60	2.72	27	1.22
176°	23.62	6	.25	0	-	62	2.62	8	.34
177°	24.18	1	.04	0	-	16	.66	6	.25
178°	26.42	1	.04	0	-	24	.91	2	.08
179°	7.83	0	-	0	-	1	.13	0	-
180°	13.42	0	-	0	-	91	6.78	7	.52
179°E	40.23	3	.07	11	.27	53	1.32	0	-
178°-177°E	27.62	2	.07	7	.25	19	.69	0	-

^{1/} Corrected counts were established by dividing hours of survey into the respective animal counts.

Recommendations for Future Research

The North Pacific Fishery Management Council and the Secretary of Commerce in preparing, approving and implementing a fishery management plan must consider whether the fishing authorized by the plan will comply with the MMPA moratorium on unregulated marine mammal taking; and, if a taking is involved, whether permits for such taking can be secured. The major policy objectives of the MMPA state that "such species and population stocks should not be permitted to diminish beyond the point at which they cease to be a significant functioning element in the ecosystem of which they are a part, and,, consistent with this major objective, they should not be permitted to diminish below their optimum sustainable population" (OSP). The OSP is the cornerstone of determining whether any taking is allowed under the MMPA.

Accurate censusing of breeding and wintering populations is necessary before OSP determinations and assessment of the effects of incidental take can be calculated. Additionally, information on reproduction rates and mortality are required to determine OSP levels.

In regard to censusing northern sea lion populations in the Aleutian Islands, the present survey should be repeated at least once every five years including those areas in the Aleutians not covered in this survey. Budgetary limitations may preclude this option requiring use of an alternative method to monitor the population. A suggested alternative is to monitor representative sample rookery and haul sites as an indication to fluctuations in population levels and reproduction rates through time. The "representative" rookeries and haul sites should be visited yearly, but at a minimum, every three years. A statistically reliable method or sampling design and a determination of a minimum population size of the rookery would be required to facilitate choice of the sample rookery and allow statistically reliable sampling through time.

There may be movements of sea lions from one rookery or haul site to another from one year to the next. A tagging study similar to that which the ADFG carried out in the Gulf of Alaska in 1977-79 should be initiated in the Aleutians for at least two large rookeries to study site tenacity and movement of sea lions throughout the Aleutian Islands. Initiation of a tagging study requires a major commitment in subsequent years to survey and locate tagged animals.

Research is needed to study gross reproduction rate, natural mortality, mortality caused by incidental take, and other man caused hazards before adequate OSP levels can be determined. Of utmost importance is to conduct research to determine the cause of the decline in sea lion abundance in the eastern Aleutian Islands.

All research efforts should be coordinated with other federal and state agencies and the private sector to optimize effort and minimize expense.

Regarding comments on future surveys, we believe that the vessel and inflatable rafts used during our survey were adequate and the only viable method considering the environmental conditions which occur in the Aleutian Islands during the sea lion breeding season. On many occasions, we were able to obtain reliable counts when fog or low clouds would have prohibited safe aerial surveys. We were also able to approach the rookeries and haul sites quite closely without disturbing the animals; an aircraft flying at the same distance from the animals (200 m or less) probably would have resulted in a stampede causing some pup mortality and unreliable counts. If time allows, the best method is to count from an observational platform on land over a two-day period. Unfortunately the hazards of landing on the islands and the steep topography of many rookeries and haul sites would preclude this option at many locations.

In those instances when a land-based survey is required (i.e., to compare counts from a surface vessel as done in this study at the Saddleridge Point rookery on Seguam or to make an accurate pup count), we recommend that it be accomplished near the end of the breeding season when the pups are larger and the adult males are not as strongly territorial. Land-based surveys during the earlier part of the breeding season could result in high pup mortality if the territorial males are stampeded into the water and could also interfere with establishment and retention of territories by the adult males.

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List of anchorages, central Aleutian Island Survey 16 June to 15 July 1979.

16 June	Dutch Harbor, Unalaska I.
17 June	Cemetary Cove, Umnak I.
18 June	Applegate Cove, Chuginadak I.
19 June	Northeast Side, Amukta I.
20 June	Finch Cove, Sequam I.
21 June	
22 June	Harolds Haven, Amlia I.
23 June	Sviechnikof Harbor, Amlia I.
24 June	Nazan Bay, Atka I.
25 June	Bechevin Bay, Atka I.
26 June	Umak Bight, Umak I.
27 June	Sand Cove, Great Sitkin I.
28 June	Cable Bay, Tanaga I.
29 June	Scabbard Bay, Adak I.
30 June	Tanaga Bay, Tanaga I.
1 July	North side, Kavalga I.
3 July	Pochnoi Bight, Semisopochni I.
3-4 July	Constantine Harbor, Amchitka I.
5 July	Chitka Bay, Amchitka I.
6 July	North side, Little Sitkin I.
7 July	Vega Bay, Kiska I.
8 July	Witchcraft Pt., Kiska I.
9 July	Kiska Harbor, Kiska I.
12 July	Nazan Bay, Atka I.
12 July	Saddleridge Pt., Sequam I.
13 July	Crater Anchorage, Yunaska I.
15 July	North side, Bogoslof I.
15 July	Dutch Harbor, Unalaska I.

Appendix II. --Surveys and counts of northern sea lion (*Eumetopias jubatus*) by island and/or haulsite, central Aleutian Islands, Alaska, 17 June-15 July 1979.

Island surveyed	Major sea lion locations	Date (1979)	Time ^{1/}	Latitude	Longitude	Survey platform ^{2/}	Sea lion counts ^{3/}			Island Total ^{4/}
							Bulls	Pups	Other	
Fox Islands:										
Bogoslof	Entire island	7/15	0750-1000	53°56'06"N	168°02'12"W	raft	147	914	1316	2377
Fire	Entire island	7/15	0740-0750	53°56'40"N	168°02'50"W	raft	0	0	4	4
Islands of Four Mountains:										
Uliaga	N side W Point	6/18	1007	53°03'40"N	169°47'12"W	raft	10	0	171	194
	Misc.	6/18	0920-1040			raft	3	0	10	
Kagamil	Rock near NE Point	6/18	1110	53°02'45"N	169°40'35"W	raft	5	0	136	143
	Misc.	6/18	1046-1220			raft	0	0	2	
Chuginadak	Concord Point	6/18	1802-1824	52°46'40"N	169°45'40"W	raft	(16)	3	(571)	933
	Concord Point (repeat)	7/14	1441-1610	52°46'40"N	169°45'40"W	raft	67	(1)	846	
	Misc.	6/18	1355-1835			raft	1	0	16	
Carlisle	Rock near NW Point	6/18	1454	52°30'35"N	170°05'08"W	ship (close)	7	0	52	59
	Misc.	6/18	1400-1454			ship (close)	0	0	0	
	Misc.	6/19	0700-0735			ship	0	0	0	
Herbert	Entire island	6/18	2035-2125	52°45'00"N	170°05'00"W	ship	0	0	(16)	46
	(continued)	6/19	0805-1033			raft & ship	1	0	45	
Yunaska	NE shore, near Lava Flow	6/19	1425-1500	52°41'40"N	170°36'40"W	raft	(48)	(187)	1360	2249
	NE shore (repeat)	7/14	0850-1058	52°41'40"N	170°36'40"W	raft	96	752	(1085)	
	Misc.	6/19	1303-1710			raft	8	0	33	
Chagulak	E side SW Point	7/13	2045-2130	52°33'56"N	171°08'10"W	raft	4	0	47	51
Amukta	Beach W of SW Point	7/13	1920	52°27'55"N	171°18'31"W	raft	7	11	173	254
	Rock S of Amukta	7/13	1935	52°27'25"N	171°14'00"W	raft	1	0	53	
	Misc. (partial survey)	6/20	0800-1215			raft	(2)	0	(21)	
	Misc.	7/13	1910-2025			raft	3	0	6	
Andreanof Islands:										
Sequam	1.4 km SE Wharf Point	6/21	1920	52°21'40"N	172°19'22"W	ship	1	0	41	7522
	3.7 km SW Moundhill Point	6/21	1033	52°18'24"N	172°21'46"W	raft	12	4	129	
	Lava Point	6/21	1245	52°16'40"N	172°25'00"W	raft	32	14	326	
	3.2 km W Turf Point	6/21	1405	52°15'28"N	172°35'00"W	ship	16	5	256	
	SW Point	6/21	1425	52°15'02"N	172°36'30"W	ship	0	0	20	
	On rock ledge	6/21	1449	52°15'30"N	172°37'00"W	ship	4	0	32	
	S of Saddleridge Point	6/21	1605	52°19'20"N	172°35'30"W	raft	29	64	341	

Appendix II.--Surveys and counts of northern sea lion (*Eumetopias jubatus*) by island and/or haulsite, central Aleutian Islands, Alaska, 17 June-15 July 1979.--continued

Island surveyed	Major sea lion locations	Date (1979)	Time ^{1/}	Latitude	Longitude	Survey platform ^{2/}	Sea lion counts ^{3/}			Island total ^{4/}
							Bulls	Pups	Other	
	E Saddleridge Point	6/21	1646-1820	52°21'00"N	172°34'00"W	raft	147	(631)	3367	
	E Saddleridge Point (repeat)	7/12	1740-1915	52°21'00"N	172°34'00"W	raft	(88)	(1521)	(2579)	
	E Saddleridge Point (repeat)	7/13	0910-1310	52°21'00"N	172°34'00"W	raft	(86)	(1497)	(2173)	
	E Saddleridge Point (repeat)	7/13	0910-1310	52°21'00"N	172°34'00"W	above beach	(82)	2407	(2750)	
	E Saddleridge Point (repeat)	7/13	1210-1300	52°21'00"N	172°34'00"W	on beach	-	(2227)	-	
	E Saddleridge Point Misc.	6/21	1720	52°21'20"N	172°33'40"W	raft	22	4	76	
	Misc.	6/21	0845-1835			ship	24	2	147	
Agligadak	Entire island	6/22	1400-1545	52°06'10"N	172°54'00"W	raft & ship	44	0	949	993
Tanadak	Entire island	6/22	1200-1255	52°04'15"N	172°51'25"W	raft	24	1	162	187
Sagigik	Entire island	6/22	0837-0900	52°00'50"N	173°09'00"W	ship (close)	31	4	227	262
Amlia	East Cape, S side	6/22	1430	52°05'25"N	172°58'01"W	ship	-	-	est(300)	3439
	East Cape, S side (repeat)	7/12	1343-1427	52°05'25"N	172°58'01"W	raft	33	0	1143	
	East Cape, N side	6/22	1625-1705	52°06'00"N	172°50'01"W	raft	51	?	1236	
	" " " "	6/23	0750-0810	52°06'53"N	172°58'35"W	raft				
	East Cape, N side (repeat)	7/12	1243-1336	52°07'50"N	173°05'55"W	raft	(19)	0	(876)	
	" " " "	"	"	52°06'00"N	172°50'01"W	"				
	Islet W of Sviechnikof Harbor	6/24	0710-0740	52°02'00"N	173°23'35"W	raft	31	0	836	
	Cape Misty	6/24	0930-1045	52°02'31"N	173°50'10"W	raft	1	0	105	
	Misc.	6/22-24 & 7/12				ship	0	0	3	
Atka	W of North Cape	6/25	0905-0957	52°24'20"N	174°17'45"W	raft	27	0	1151	1192
	Misc.	6/24-25				ship & raft	1	0	13	
Amtagis	Entire island	6/24	1410-1425	52°01'00"N	174°25'40"W	raft	0	0	0	0
Sagchudak	Entire island	6/24	1317-1402	52°01'00"N	174°29'00"W	raft	1	0	9	10
Koniuji	Entire island	6/25	1520-1555	52°13'15"N	175°07'20"W	raft & ship(close)	3	0	106	109
Kasatochi	Entire island	6/25	1740-1830	52°10'25"N	175°29'20"W	raft & ship(close)	79	213	1874	2166
Ikiqinak	Entire island	6/27	1015-1050	51°58'40"N	175°29'30"W	raft	0	0	5	5

Appendix II.--Surveys and counts of northern sea lion (*Eumetopias jubatus*) by island and/or haulsite, central Aleutian Islands, Alaska, 17 June-15 July 1979.--continued

Island surveyed	Major sea lion locations	Date (1979)	Time ^{1/}	Latitude	Longitude	Survey platform ^{2/}	Sea lion counts ^{3/}			Island total ^{4/}
							Bulls	Pups	Other	
Tagalak	N and S shore	6/26 & 27	0925&0855	51°58'00"N	175°43'00"W	ship	0	0	0	0
Chuqul	N and S shore	6/26 & 27	0935&0822	51°57'00"N	175°49'00"W	ship	0	0	0	0
Igitkin	S shore	6/26	0935-0949	51°59'00"N	175°55'00"W	ship	0	0	0	0
Anagaksik	SW Point	6/27	0705-0810	51°52'50"N	175°54'59"W	raft	4	0	120	124
Ulak	Entire island	6/27	1345-1355	52°02'00"N	175°54'00"W	ship (close)	0	0	0	0
Great Sitkin	E of Swallow Head	6/27	1515-1615	52°06'25"N	176°04'50"W	raft	4	0	137	312
	"	6/27	1515-1615	52°06'35"N	176°05'25"W	raft	3	0	160	
	Misc.	6/27	1415-1710			ship (close)	0	0	8	
Tanaklak	E,S,&W shore	6/27	1712-1748	51°57'00"N	176°06'00"W	ship (close)	0	0	0	0
Asuksak	Entire island	6/26-27	1742	51°56'00"N	176°06'00"W	ship (close)	0	0	0	0
Aziak	N & E shore	6/27	1712	51°57'00"N	176°09'00"W	ship (close)	0	0	0	0
Umak	N & E shore	6/26-27	1100&0635	51°53'00"N	176°00'00"W	ship	0	0	0	0
Little Tanaga	Tana Point	6/26	1200	51°49'15"N	176°13'45"W	ship (close)	7	0	189	196
	Misc.	6/26	1110-1220	51°50'00"N	176°10'00"W	ship	0	0	0	
Kagalaska	W shore	6/30	1435-1450	51°48'00"N	176°22'00"W	ship (close)	0	0	0	0
Adak	Lake Point	6/28	1055-1115	51°37'32"N	176°59'15"W	raft	103	20	972	1367
	Cape Yakak	6/28	1145	51°35'35"N	176°56'45"W	ship	0	0	270	
	Misc.	6/28-30				ship	0	0	2	
Kanaga	NE Ship Rock	7/11	1140-1235	51°46'55"N	177°21'00"W	raft	2	0	168	493
	North Cape	7/11	1405-1450	51°56'00"N	177°09'00"W	raft	14	0	295	
	Misc.	6/28-29 & 7/11				ship	0	0	14	
Bobrof	Entire island	6/29	1648-1743	51°54'00"N	177°26'00"W	ship (close)	0	0	0	0
Tanaga	SW Cape Sasmik	6/28	1640	51°36'00"N	177°55'00"W	ship	2	0	28	493
	N side	6/29	1345	51°55'07"N	178°08'30"W	ship (close)	8	0	8	
	SE Bumpy Point	6/29	1435	51°55'00"N	177°57'00"W	ship (close)	6	0	436	
	Misc.	6/28-30				ship	0	0	5	
Delarof Islands:										
Ilak	Entire island	7/2	1150-1215	51°29'00"N	178°18'00"W	raft & ship	0	0	0	0
Gramp Rock	Entire island	7/2	1225-1255	51°29'10"N	178°20'50"W	raft	123	present	1582	1705
Ugidak	Entire island	7/1	1205-1235	51°35'00"N	178°30'15"W	ship (close)	10	0	244	254
Tag Is. Tag	Entire island	7/1	1310-1357	51°33'30"N	178°34'05"W	raft	135	?	1574	1740
	Rock N of Tag	7/1	1357	51°34'10"N	178°34'30"W	raft	3	0	28	
Skagul	N & S shore	7/1 & 2	1430&1010	51°36'00"N	178°34'00"W	raft & ship	0	0	0	0
Ogliuga	N & S shore	7/1 & 2	1430&1010	51°36'00"N	178°40'00"W	raft & ship	0	0	0	0

Appendix II.--Surveys and counts of northern sea lion (*Eumetopias jubatus*) by island and/or haulsite, Central Aleutian Islands, Alaska,
17 June-15 July 1979.--continued

Island surveyed	Major sea lion locations	Date (1979)	Time ^{1/}	Latitude	Longitude	Survey platform ^{2/}	Sea lion counts ^{3/}			Island total ^{4/}
							Bulls	Pups	Other	
Kavalga	W Point	7/2	0800-0910	51°35'00"N	178°50'50"W	raft	12	0	211	223
Gareoli	NNE side	7/1	0905	51°49'48"N	178°47'00"W	ship (close)	1	0	25	27
	Misc.	7/1	0838-1037			ship (close)	0	0	1	
Unalga	SE Point	7/1	1737	51°34'20"N	179°02'30"W	raft	1	0	53	265
	SW Point	7/1	1713	51°34'25"N	179°03'10"W	raft	9	0	174	
	Misc.	7/1	1713-1805			raft & ship(close)	0	0	28	
Dinkum Rocks	Entire island	7/1	1640	51°33'45"N	179°04'10"W	raft	2	0	152	154
Ulak	NE Hasgox Point (wreck)	7/2	1607	51°19'10"N	178°58'00"W	ship (close)	4	0	84	2374
	Hasgox Point	7/2	1625-1745	51°18'30"N	178°59'15"W	raft & ship	138	204	1944	
	Misc.	7/2	1521-2055				0	0	0	
Tanadak	S & W shore	7/2	2026-2033	51°21'00"N	179°01'00"W	ship	0	0	0	0
Amatignak	N Point	7/2	1802	51°18'10"N	179°05'50"W	ship (close)	2	0	73	128
	Knob Point	7/2	1840	51°15'10"N	179°03'30"W	ship (close)	3	0	29	
	E Nitrof Point	7/2	1905	51°13'05"N	179°07'00"W	ship (close)	0	0	10	
	W Nitrof Point	7/2	1920	51°12'45"N	179°07'45"W	ship (close)	1	0	8	
	Misc.	7/2	1802-2008			ship (close)	1	0	1	
Rat Islands:										
Semisopchnoi	Pochnoi Point	7/3	1020	51°57'55"N	179°46'30"E	raft	41	25	435	581
	North Point	7/3	1110	52°01'10"N	179°35'10"E	raft	5	0	68	
	Misc.	7/3	0920-1335			raft & ship	1	0	6	
Amchitka	Sea Otter Rock	7/3	1810	51°22'10"N	179°29'25"E	ship	0	0	0	3157
	East Cape	7/3	1900	51°22'25"N	179°28'10"E	raft	18	0	621	
	Omega Point	7/3	1825	51°21'40"N	179°25'35"E	raft	7	0	162	
	Ivakin Point	7/3	1940	51°24'55"N	179°24'05"E	raft	11	0	255	
	Column Rocks	7/6	1038-1135	51°32'30"N	178°49'30"E	raft	194	135	1749	
	Misc.	7/3-6				ship	0	0	5	
Little Sitkin	Patterson Point	7/6	1650	51°59'40"N	178°30'00"E	ship (close)	18	0	104	122
	Patterson Point (repeat)	7/7	0914	51°59'40"N	178°30'00"E	ship (close) (24)	0	0	(89)	
	Misc.	7/7	0730-0932			ship	0	0	0	
Davidof	Entire island	7/7	1015-1137	51°58'00"N	179°20'00"E	raft	0	0	2	2
Pyramid	Entire island	7/7	1056-1118	51°58'00"N	179°21'00"E	raft	0	0	0	0
Khvostof	Entire island	7/7	1143-1236	51°59'00"N	179°23'00"E	raft	0	0	0	0
Segula	Gula Point	7/7	1345	52°02'20"N	178°09'00"E	raft	29	0	31	131
	Chugal Point	7/7	1430	52°00'00"N	178°06'30"E	raft	3	0	63	
	Misc.	7/7	1340-1515			raft	0	0	5	

Appendix II. --Surveys and counts of northern sea lion (Eumetopias jubatus) by island and/or haulsite, central Aleutian Islands, Alaska, 17 June-15 July 1979.--continued

Island surveyed	Major sea lion locations	Date (1979)	Time ^{1/}	Latitude	Longitude	Survey platform ^{2/}	Sea lion counts ^{3/}			Island total ^{4/}
							Bulls	Pups	Other	
Ayugadak	N islet	7/7	1755-1910	51°45'45"N	178°24'30"E	raft	18	4	251	1485
	Ayugadak I.	7/7 & 10	1800&1625	51°45'45"N	178°24'30"E	raft	80	18	1114	
Rat	N shore	7/7	1700-1755	51°50'00"N	178°20'00"E	ship (close)	0	0	0	73
	Rugh-Burdine Rocks	7/10	1450-1515	51°46'25"N	178°16'50"E	raft	12	0	61	
Sea Lion Rock	Entire island	7/7	1600	51°52'55"N	177°59'00"E	ship	0	0	(13)	81
	Entire island (repeat)	7/10	1305	51°52'55"N	177°59'00"E	raft	3	0	78	
Tanadak	Entire island	7/9	1400-1500	51°57'00"N	177°47'25"E	raft	9	0	255	264
Little Kiska	Little Kiska Head	7/9	1525-1615	51°58'40"N	177°38'40"E	ship (close)	0	0	0	0
Kiska	N. Sobaka Rocks	7/8	0930-1015	51°49'15"N	177°19'30"E	raft	15	0	35	8378
	Lief Cove	7/8	1345	51°56'10"N	177°19'15"E	raft	2	0	12	
	1st & 2nd Coves									
	N of Lief Cove	7/8	1351-1416	51°57'00"N	177°20'00"E	raft	73	0	645	
	3rd Cove N of									
	Lief Cove	7/8	1540	51°57'55"N	177°20'40"E	raft	122	410	3622	
	4th Cove N of									
	Lief Cove	7/8	1540-1620	51°57'55"N	177°20'40"E	raft	16	66	674	
				to	to					
				51°58'45"N	177°22'40"E					
	Cape St. Stephan	7/8	1635-1810	51°54'25"N	177°13'40"E	raft	172	137	2339	
				to	to					
				51°52'40"N	177°13'00"E					
	Wolf Point	7/9	0925	52°07'15"N	177°33'50"E	ship (close)	8	0	18	
	Misc.	7/8-10				ship	2	0	10	
Pillar Rock	All	7/9	0830	52°08'10"N	177°22'30"E	ship (close)	0	0	35	35

^{1/} When only one time is given, it indicates the start of the survey.

^{2/} Survey platform refers to the raft (4.5m motorized, inflatable boat), ship (33m commercial crabbing vessel), or land-based counting effort. Where raft, ship (close), or land were used, counts are considered complete and reliable.

^{3/} Parenthetic numbers are of replicate surveys and are not included in island total column. Where counts from photographs were higher than in field counts, they were incorporated.

^{4/} Island totals include all animals seen on specifically identified haul sites and miscellaneous sightings along the shore and in the adjacent waters. Maximum counts are used whenever replicate surveys were run.

Appendix III.--Numbers of harbor seal (*Phoca vitulina richardii*) and sea otters (*Enhydra lutris*) sighted during a survey of the central Aleutian Islands, Alaska, 17 June-15 July 1979.

Island surveyed	Date (1979)	Time	Harbor seals		Total	Sea otters		Total
			Pups	Older ^{1/}		Pups	Older ^{1/}	
Fox Islands:								
Bogoslof	7/15	0750-1000	0	3	3	0	0	0
Fire	7/15	0740-0750	0	3	3	0	0	0
Islands of Four Mountains:								
Uliaga	6/18	0920-1040	0	4	4	0	0	0
Kagamil	6/18	1046-1220	0	91	91	0	6	6
Chuginadak	6/18	1355-1835	0	57	57	6	25	31
Carlisle	6/18	1400-1454	0	0	12	0	0	0
	6/19	0700-0735	0	12		0	0	
Herbert	6/18	2035-2125	0	0	22	0	0	2
	6/19	0805-1033	0	22		0	2	
Yunaska	6/19	1303-1710	0	19	19	2	19	21
Chagulak	7/13	2045-2130	0	9	9	0	0	0
Amukta	7/13	1910-2025	1	24	25	0	13	13
Andreanof Islands:								
Sequam	6/21	0845-1835	0	4	4	37	127	164
Agligadak	6/22	1400-1545	0	0	0	0	0	0
Tanadak	6/22	1200-1255	0	0	0	0	89	89
Sagigik	6/22	0837-0900	0	0	0	0	0	0
Amlia	6/22	1625-2000	0	1	19	8	117	216
	6/23	0750-1410	0	1		2	4	
	6/24	0710-1045	0	0		6	29	
	7/12	0820-1450	0	17		2	48	
Atka	6/24	1645-1830	0	0	1	0	47	123
	6/25	0600-1335	0	1		5	71	
Amtagis	6/24	1410-1425	0	32	32	4	11	15
Sagchudak	6/24	1317-1402	0	101	101	8	50	58
Koniuji	6/25	1520-1555	0	0	0	1	5	6

Appendix III. --Numbers of harbor seal (*Phoca vitulina richardii*) and sea otters (*Enhydra lutris*) sighted during a survey of the central Aleutian Islands, Alaska, 17 June-15 July 1979--continued.

Island surveyed	Date (1979)	Time	Harbor seals		Total	Sea otters		Total
			Pups	Older ^{1/}		Pups	Older ^{1/}	
Andreanof Islands (contd)								
Kasatochi	6/25	1740-1830	0	0	0	4	9	13
Ikiginak	6/27	1015-1050	0	2	2	4	25	29
Tagalak	6/26	0925-0935	0	0	0	0	0	0
	6/27	0855-0928	0	0	0	0	0	0
Chugul	6/26	0935-0948	0	0	0	0	0	0
	6/27	0822-0828	0	0	0	0	0	0
Igitkin	6/26	0935-0949	0	0	0	0	69	69
Anagaksik	6/27	0705-0810	0	0	0	0	0	0
Ulak	6/27	1345-1355	0	5	5	1	12	13
Great Sitkin	6/27	1415-1710	0	8	8	13	91	104
Tanaklak	6/27	1712-1728	0	15	15	0	75	75
Asuksak	6/27	1742	0	8	8	1	13	14
Aziak	6/27	1712	0	12	12	0	15	15
Umak	6/26	1015-1100	0	11	13	present	62	94
	6/26	1520-1600	0	2	0	0	32	0
Little Tanaga	6/26	1110-1220	0	0	0	0	1	1
Kagalaska	6/30	1435-1450	0	0	0	0	11	11
Adak	6/28	0720-1200	0	20	20	0	85	96
	6/30	1310-1643	0	0	0	0	11	0
Kanaga	6/28	1300-1500	0	0	66	1	5	87
	7/11	1037-1805	3	63	0	10	71	0
Bobrof	6/29	1648-1743	0	0	0	0	5	5
Tanaga	6/28	1615-1837	0	2	3	1	104	128
	6/29	1156-1617	0	1	0	4	19	0
Delarof Islands:								
Ilak	7/2	1150-1215	0	0	0	4	39	43
Gramp Rock	7/2	1225-1255	0	0	0	5	118	123
Ugidak	7/1	1205-1235	0	0	0	0	2	2
Tag Islands	7/1	1235-1430	0	0	0	4	20	24
Skagul	7/1	1430-1437	0	0	0	0	0	0
	7/2	1010-1020	0	0	0	0	0	0
Ogliuga	7/1	1437-1445	0	0	0	0	0	1
	7/2	1000-1010	0	0	0	0	1	0
Kavalga	7/1	1445-1540	0	0	0	0	0	33
	7/2	0800-0910	0	0	0	3	30	0

Appendix III. --Numbers of harbor seal (*Phoca vitulina richardii*) and sea otters (*Enhydra lutris*) sighted during a survey of the central Aleutian Islands, Alaska, 17 June-15 July 1979--continued.

Island surveyed	Date (1979)	Time	Harbor seals		Total	Sea otters		Total
			Pups	Older ^{1/}		Pups	Older ^{1/}	
Delarof Islands (contd)								
Gareoli	7/1	0838-1037	0	0	0	0	7	7
Unalga	7/1	1713-1805	0	20	20	8	84	92
Dinkum Rocks	7/1	1640-1713	0	0	0	3	11	14
Ulak	7/2	1521-1745	0	4	4	0	0	2
	7/2	2020-2055	0	0	0	0	2	
Tanadak	7/2	2026-2033	0	0	0	0	1	1
Amatignak	7/2	1802-2008	0	0	0	0	0	0
Rat Islands:								
Semisopchnoi	7/3	0920-1335	0	16	16	5	142	147
Amchitka	7/3	1810-1952	0	3	15	24	144	263
	7/5	0930-1915	0	11		6	78	
	7/6	0700-1424	0	1		0	8	
	7/10	1838-2217	0	0		0	3	
	7/6	1650-1737	0	0	0	0	5	15
Little Sitkin	7/7	0730-0932	0	0		0	10	
Davidof and Pyramid	7/7	1015-1137	10	34	44	9	85	94
Khvostof	7/7	1143-1236	0	0	0	18	92	110
Segula	7/7	1340-1515	0	7	7	16	75	91
Ayugadak	7/7	1755-1910	0	0	0	12	85	117
	7/10	1625-1700	0	0		0	20	
Rat	7/7	1700-1755	0	0	0	5	97	148
	7/10	1401-1548	0	0		0	46	
Sea Lion Rock	7/10	1305-1327	0	0	0	15	54	69
Tanadak	7/9	1400-1500	0	4	4	8	51	59
Little Kiska	7/9	1525-1615	0	0	0	0	2	2
Kiska	7/8	0810-2020	0	2	10	8	145	215
	7/9	0745-1740	0	0		3	20	
	7/10	0845-1055	1	7		3	36	
Total Counted			15	659	674	279	2,891	3,170

^{1/} Older = animals older than pups.

Appendix IV.--Northern fur seal (Callorhinus ursinus) sighted during
a survey of the central Aleutian Islands, Alaska, 17 June - 15 July 1979.

Date (1979)	Time	Location (North)		count	Remarks
25 June	0718	52°21'40"	173°58'48"W	1	Sighted 1.8 km east of first unnamed cape north of Cape Shaw, Atka
6 July	1023	51°34'36"	178°43'35"E	1	Adult female sighted 2.7 km off southwest side Amchitka
8 July	1620	51°54'26"	177°12'30"E	1	Adult, female sighted off Cape St. Stephen, Kiska
14 July	1800	53°01'29"	169°21'28"W	1	Adult female sighted 25 km east of Kagamil
15 July	0900	53°56'05"	168°02'32"W	2	One adult male and one subadult male on boulder beach in cove on northwest side of Bogoslof
15 July	1110	53°56'06"	167°48'28"W	1	Sighted 15 km east of Bogoslof.

Appendix V. --Number and location of cetaceans observed during a survey of the central Aleutian Islands, Alaska
17 June-15 July 1979.

Species	Count	Date	Time	Latitude	Longitude	Remarks
Minke whale				North		
<u>Balaenoptera acutorostrata</u>	1	22 June 79	0925	52°03'13"	173°10'14"W	
	1	22 June 79	1014	52°04'00"	173°01'44"W	
	1	22 June 79	1430	52°05'30"	172°54'30"W	
	1	22 June 79	1521	52°09'30"	172°53'00"W	
	1	22 June 79	1830	52°07'00"	173°17'00"W	
	2	23 June 79	1045-1110	52°00'22"	173°18'27"W	=same location as killer whales
	1	24 June 79	0950	52°00'20"	173°51'00"W	
	1	24 June 79	1235	52°00'18"	174°20'26"W	
	2	24 June 79	1350	53°01'22"	174°28'13"W	Breached 3-4 times
	1	24 June 79	1532	53°04'25"	174°09'04"W	
	1	24 June 79	1554	52°06'47"	174°03'33"W	
	1	24 June 79	1609	52°09'29"	174°04'16"W	
	1	24 June 79	1705	52°10'00"	174°05'30"W	
	1	24 June 79	1737	52°13'30"	174°08'36"W	
	1	24 June 79	1740	52°13'00"	174°09'20"W	
	1	26 June 79	0948	51°59'33"	175°52'59"W	
	1	26 June 79	1100	51°53'20"	176°06'50"W	
	1	27 June 79	1405	52°03'17"	175°58'35"W	
	1	28 June 79	0838	51°56'59"	176°50'54"W	
	3	28 June 79	0847	51°55'40"	176°49'20"W	
	1	28 June 79	1010	51°42'51"	176°58'11"W	
	1	1 July 79	1833	51°39'18"	178°53'19"W	
	1	7 July 79	1542	51°59'12"	178°00'55"E	
	1	7 July 79	1755	51°45'45"	178°24'30"E	
	1	10 July 79	0937	52°01'11"	177°40'02"E	
	1	10 July 79	1200	52°01'00"	177°47'10"E	
	1	10 July 79	2024	51°27'22"	178°59'53"E	
	1	11 July 79	1103	51°45'33"	177°30'35"W	
	1	12 July 79	1015	52°10'22"	173°36'35"W	
	1	12 July 79	1240	52°07'01"	173°06'14"W	
	1	15 July 79	1446	54°01'39"	166°46'21"W	
	4	15 July 79	1530	54°00'03"	166°36'20"W	
	3	15 July 79	1538	53°58'30"	166°33'40"W	
	1	15 July 79	1540	53°58'20"	166°33'40"W	

Appendix V. --Number and location of cetaceans observed during a survey of the central Aleutian Islands, Alaska
17 June-15 July 1979--continued.

Species	Count	Date	Time	Latitude	Longitude	Remarks
North						
Fin whale <u>Balaenoptera physalus</u>	1	15 July 79	1420	54°00'54"	166°53'29"W	
Rorquals	3	11 July 79	2100	52°15'43"	175°32'22"W	Dorsal fin well back, high blows, est. length 12 m
Killer whale <u>Orcinus orca</u>	27	23 June 79	1045-1110	52°00'48"	173°15'58"W	Same location as 2 minke whales
	7	25 June 79	1610	52°13'30"	175°13'41"W	2 adult males, 5 med. size
	8	6 July 79	0745	51°42'48"	178°47'41"E	2 adult males, 1 small
	3	7 July 79	1400	52°06'32"	178°05'28"E	
	7	8 July 79	0947	51°49'15"	177°19'30"E	
	3	12 July 79	1140	52°07'32"	173°15'42"W	2 adult males
	2	13 July 79	1718	52°28'40"	171°48'45"W	Both adult males
	6	15 July 79	1305	53°59'48"	167°13'37"W	
Harbor porpoise <u>Phocoena phocoena</u>	12	27 June 79	1415	52°01'45"	175°58'45"W	Close to beach
	4	27 June 79	1748	51°58'00"	176°05'10"W	Great Sitkin I.
Dall's porpoise <u>Phocoenoides dalli</u>	3	17 June 79	0716	54°03'00"	166°55'00"W	Bow ride
	3	17 June 79	0728	54°03'35"	166°57'18"W	
	10	17 June 79	0856	54°00'00"	167°16'00"W	Bow ride
	6	17 June 79	1512	53°29'36"	168°23'48"W	
	5	17 June 79	1517	53°29'01"	168°24'09"W	
	2	18 June 79	1935	52°43'16"	169°54'00"W	
	4	20 June 79	1408	52°30'59"	171°19'42"W	
	5	24 June 79	0910	52°02'30"	173°49'10"W	
	19	24 June 79	1618	52°11'09"	174°04'13"W	Bow ride
	3	24 June 79	1705	52°10'00"	174°05'30"W	
	4	25 June 79	0603	52°13'17"	174°06'58"W	
	1	25 June 79	1100	52°18'30"	174°28'00"W	

Appendix V. --Number and location of cetaceans observed during a survey of the central Aleutian Islands, Alaska
17 June-15 July 1979--continued.

Species	Count	Date	Time	Latitude	Longitude	Remarks
Dall's porpoise				North		
<u>Phocoenoides dalli</u>	3	25 June 79	1115	53°17'08"	174°25'39"W	
	7	25 June 79	1435	52°12'37"	174°56'19"W	
	3	25 June 79	1455	52°12'52"	175°01'52"W	
	2	25 June 79	1620	52°13'16"	175°15'43"W	Feeding
	4	25 June 79	1722	52°12'57"	175°26'38"W	
	3	26 June 79	0633	52°05'38"	175°15'09"W	
	6	26 June 79	1100	51°53'20"	176°06'50"W	
	4	26 June 79	1113	51°54'35"	176°10'57"W	
	2	26 June 79	1129	51°52'42"	176°15'57"W	
	8	26 June 79	1335	51°50'03"	175°57'37"W	Follows ship
	8	27 June 79	0635	51°54'10"	175°55'48"W	
	7	27 June 79	1335	52°02'44"	175°50'25"W	
	2	27 June 79	1345	52°02'25"	175°53'15"W	
	4	27 June 79	1430	52°03'53"	175°58'23"W	
	12	27 June 79	1458	52°08'19"	176°05'12"W	
	3	27 June 79	1658	52°00'59"	176°13'39"W	
	7	27 June 79	1730	51°57'45"	176°07'45"W	
	4	28 June 79	0950	51°46'10"	176°56'41"W	
	2	28 June 79	1050	51°37'45"	176°59'45"W	
	6	29 June 79	1330	51°56'28"	178°12'30"W	
	3	29 June 79	1336	51°56'20"	178°11'00"W	
	4	29 June 79	1703	51°53'25"	177°25'00"W	
	1	29 June 79	1935	51°57'17"	176°58'06"W	
	3	29 June 79	2002	51°59'48"	176°50'25"W	
	1	29 June 79	2212	51°54'39"	176°27'38"W	
	5	29 June 79	2228	51°53'25"	176°31'25"W	
	9	30 June 79	1500	51°43'37"	176°27'07"W	
	3	30 June 79	1616	51°37'20"	176°42'17"W	
	6	30 June 79	1942	51°34'58"	177°38'16"W	
	3	30 June 79	2045	51°34'43"	177°55'14"W	
	6	30 June 79	2140	51°37'13"	178°10'09"W	
	3	1 July 79	1828	51°38'18"	178°54'15"W	
	3	2 July 79	1022	51°39'22"	178°31'46"W	
	3	2 July 79	1715	51°18'30"	178°59'12"W	

Appendix V. --Number and location of cetaceans observed during a survey of the central Aleutian Islands, Alaska
 17 June-15 July 1979--continued.

Species	Count	Date	Time	Latitude	Longitude	Remarks
				North		
Dall's porpoise						
<u>Phocoenoides dalli</u>	1	2 July 79	1932	51°15'59"	179°11'17"W	
	1	3 July 79	1245	51°53'25"	179°33'00"E	
	15	3 July 79	1301	51°51'30"	179°36'50"E	
	5	3 July 79	1328	51°55'44"	179°42'55"E	Bow ride
	4	3 July 79	1635	51°26'58"	179°33'32"E	Feeding
	6	3 July 79	1658	51°23'18"	179°32'01"E	
	8	3 July 79	1712	51°21'39"	179°30'01"E	Bow ride
	3	3 July 79	1719	51°20'00"	179°28'30"E	Bow ride
	4	3 July 79	1855	51°21'28"	179°29'26"E	
	4	3 July 79	1910	51°23'38"	179°31'51"E	
	5	3 July 79	1918	51°24'37"	179°30'11"E	Bow ride
	4	5 July 79	0935	51°25'30"	179°18'00"E	
	6	5 July 79	0940	51°25'30"	179°16'00"E	
	3	5 July 79	1028	51°31'47"	179°11'13"E	White tips ^{1/}
	2	5 July 79	1045	51°33'37"	179°07'57"E	White tips
	2	5 July 79	1248	51°42'30"	178°43'52"E	
	2	5 July 79	1309	51°43'44"	178°38'00"E	
	6	5 July 79	1725	51°42'28"	178°46'26"E	White tips
	2	6 July 79	1512	51°49'48"	178°32'27"E	
	25	7 July 79	0830	51°56'03"	178°28'01"E	
	7	7 July 79	0942	52°03'21"	178°26'22"E	Bow ride
	4	8 July 79	0910	51°48'30"	177°20'00"E	
	6	8 July 79	1125	51°57'19"	177°10'10"E	
	1	8 July 79	1940	52°02'09"	177°19'01"E	
	3	9 July 79	0840	52°07'15"	177°23'15"E	White tips
	3	9 July 79	1345	52°02'31"	177°44'42"E	
	2	10 July 79	1220	51°57'30"	177°54'00"E	White tips
	5	10 July 79	1814	51°33'00"	178°40'30"E	White tips
	4	10 July 79	1838	51°35'30"	178°36'30"E	White tips
	7	10 July 79	2104	51°22'35"	179°07'04"E	White tips
	6	10 July 79	2127	51°20'24"	179°11'56"E	White tips
	6	10 July 79	2206	51°19'00"	179°26'00"E	White tips
	2	10 July 79	2233	51°20'00"	179°32'00"E	White tips

Appendix V. --Number and location of cetaceans observed during a survey of the central Aleutian Islands, Alaska
17 June-15 July 1979--continued.

Species	Count	Date	Time	Latitude	Longitude	Remarks
Dall's porpoise				North		
<u>Phocoenoides dalli</u>	3	11 July 79	1010	51°49'22"	177°34'06"W	White tips
	11	11 July 79	2105	52°15'43"	175°32'22"W	White tips, bow ride
	2	11 July 79	2140	52°17'10"	175°21'00"W	White tips, bow ride
	6	11 July 79	2157	52°18'05"	175°17'26"W	White tips, bow ride
	1	12 July 79	0810	52°11'22"	174°02'22"W	
	29	12 July 79	0836	52°09'29"	173°58'04"W	White tips, in groups up to 8
	6	12 July 79	0917	52°10'18"	173°51'32"W	
	1	14 July 79	1223	52°42'06"	170°15'56"W	White tips
	2	14 July 79	1413	52°44'46"	169°47'04"W	White tips
	1	14 July 79	1540	52°46'34"	169°42'34"W	
	1	14 July 79	1843	53°06'45"	169°13'19"W	
	1	14 July 79	2134	53°31'40"	168°38'10"W	White tips, bow ride
	5	15 July 79	1217	53°57'24"	167°27'55"W	White tips
	3	15 July 79	1231	53°57'52"	167°23'24"W	
	4	15 July 79	1438	54°01'31"	166°49'58"W	
	5	15 July 79	1507	54°02'02"	166°39'49"W	
	2	15 July 79	1532	54°00'03"	166°36'20"W	
	8	15 July 79	1536	53°59'00"	166°34'30"W	
Beaked whale						
<u>Mesoplodon</u> ?	12	25 June 79	1642	52°12'40"	175°22'21"W	
<u>Mesoplodon</u> ?	15	25 June 79	1642	52°12'40"	175°22'21"W	
<u>M. stejnegeri</u>	2	29 June 79		51°46'30"	178°01'00"W	Stranded in Tanaga Bay
<u>Mesoplodon</u> ?	3-4	29 June 79	2020	52°00'59"	176°46'13"W	
<u>Mesoplodon</u> sp.	7	3 July 79	1531	51°37'27"	179°38'33"E	
<u>Mesoplodon</u> ?	6	11 July 79	0915	51°54'40"	177°40'26"W	
<u>Mesoplodon</u> sp.	4	11 July 79	1557	51°59'24"	176°52'53"W	
Beaked whales ?	4	14 July 79	2105	53°26'54"	168°45'25"W	
Unidentified whale	4	20 June 79	1545	52°23'30"	171°48'00"W	
	1	24 June 79	1200	52°00'47"	174°17'10"W	
	1	3 July 79	1554	51°33'41"	179°36'41"E	
	1	5 July 79	1040	51°33'14"	179°08'33"E	

1/ Began recording presence of white on tail flukes and dorsal fin.

Appendix VI.--Checklist of bird sightings made during a marine mammal survey of the Aleutian Islands 16 June to 15 July 1979.

SPECIES	Uliaga	Kagamil	Carlisle	Chuginadak	Herbert	Yunaska	Amukta co Sequem	Sequem	Amia	Tanadak	Amia Swiechnikof Harbor	Alka South Side	Alka Nazam Bay	Sagchudak	Amtegis	Alka North Side	Alka Four Stacks	Alka S. Korovin Bay	Koniuji	Kasatochi	Umak Umak Bight	Ikiginak	Great Sitkin	Great Sitkin Sand Bay	Coastal Waters North of Adak, Kanaga, Tanaga	Tanaga Tanaga Bay	Coastal Waters South of Adak, Kanaga, Tanaga	30
	18	18	18	18	19	19	20	21	22- 23	22	23- 24	23- 24	24	24	24	25	25	25	25	25	26	27	27	27	28	28	30	
Common Loon									1																			
Black-footed Albatross									1																2			
Laysan Albatross							1		2																1		6	
Pender-billed Shearwater									200																2		5	
Booby Shearwater							1																					
Almar			10	20	200	100	500	200	1000+	+		300	10	+		300			20				+		10		10	
Red-tailed Petrel																								1	1		1	
Dark-tailed Petrel							1		5+5			2																
Leach's Petrel																1					1				1			
Cormorant	20	20	20	100	50	20	20	30	100	+	+	20	10			+	+	4	10		3	3	200	4	20		4	
Phalacrocorax (Frigate) Cormorant	+	+	+	+	+	+	+	+	+									4			3	3			+		2	
Black-faced Cormorant						+		+	+				+				+					+	+				72	
Aleutian Canada Goose																							2					
Aleutian Teal																										2		
Green-winged Teal											6																	

Appendix VI.--Checklist of bird sightings made during a marine mammal survey of the Aleutian Islands 16 June to 15 July 1979--continued.

	Gareloi	Tag	Unalga	Iiak-Gramp	Ulak	Anatignak	Semisopochnoi	Semisopochnoi to Amchitka	Amchitka SE	Amchitka N	Amchitka Chitka Bay	Little Sicken	Davidof & Khvostof	Segula	Ayugadak	Kiska	Amchitka to Atka	N. Amliia	W. Sequam	Amukta	Chagulak	NE Yunaska	Chuginadak Concord Pt.	Boeoslof
	1	1	1	2	2	2	3	3	3	5	5	6- 7	<u>JULY</u> 7	7	7	8- 9	11	12	13	13	13	14	14	1
COMMON LOON																								
Black-footed Albatross								2									2							
Laysan Albatross	1				1	1	2	10		2		2				2+3	1							
Slender-billed Shearwater	2				10		10	20		10						10								
Sooty Shearwater						1		2																
Fulmar	500	10	200	20	20	10	100	300		10		100	50	20		200+200	200	50	10	20	20,000	20	20	
Scaled Petrel								3																
Fork-tailed Petrel							10	50				20	10		10	40+10	5							
Leach's Petrel								1																
Cormorant	25	2	55	10	10	10	33	2	10	21		20	40	40		200	100	100	2	10	50	10	10	30
Pelagic Cormorant	20	2	5	+	+	+	30	2	10	20		+	10	10		3								10
Red-faced Cormorant	5		50				3						1			8					+	?		
Aleutian Canada Goose																5 ^{1/}								
Aleutian Teal									1															
Green-winged Teal																								

1/ Canada Geese seen flying northeast along Tanadak's shore. No bands visible.

Appendix VI--Checklist of bird sightings made during a marine mammal survey of the Aleutian Islands 16 June to 15 July 1979--continued.

	Gareloi	Tag	Unalga	Itak-Cramp	Uiak	Anatignak	Semisopochnoi	Semisopochnoi to Amchitka	Amchitka SE	Amchitka N	Amchitka Chitka Bay	Little Sitkin	Davidof & Khvostof	Segula	Ayugadak	Kiska	Amchitka to Atka	N. Amlika	W. Sequam	Amukta	Chagulak	NE Yunaska	Chuglnadak Concord Pt.	Bogoslof	
	1	1	1	2	2	2	3	3	3	5	5	6-7	7	7	7	7	8-9	11	12	13	13	13	14	14	15
	JULY																								
Old Squaw																									
Harlequin Duck				5		1												2	4	2	20		3	1	
Common Eider										10			2			22	1	1		1					
Merganser																									
Common Merganser																715									
Bald Eagle		1		2					4		2		2	1	2	14	3	6		1			2	1	
Peregrine Falcon									2										2						
Ptarmigan									2		1														
Black Oystercatcher									4		1		2			2	2	3							
American Golden Plover																									
Short-billed Dowitcher																									
Rock Sandpiper																								1	
N. Phalarope		6																							
Parasitic Jaeger													2												
Glaucous-winged Gull	10	10	1000	20	50	500	20	10	100	50	5	100	200	100	20	400+200	200	200	20	40	1500	5	20	200	
Kittiwake	300	20	50	50	100	100		20	50	20		200	5	10	5	700	100	200	20	20	20,000		10	2,000	
Black-legged	+	+	+						+	+															
Red-legged																									

Appendix VI.--Checklist of bird sightings made during a marine mammal survey of the Aleutian Islands 16 June to 15 July 1979--continued.

SPECIES	Uliaga	Kagamil	Carlisle	Chuginadak	Herbert	Yunaska	Amukta to Sequam	Sequam	Amia	Tanadak	Amia Svetchnikof Harbor	Alka South Side	Alka Nazam Bay	Sagchudak	Antagis	Alka North Side	Alka Four Stacks	Alka S. Korovin Bay	Koniuji	Kasatochi	Umak Umak Bight	Ikinak	Great Sitkin	Great Sitkin Sand Bay	Coastal Waters North of Adak, Kanaga, Tanaga	Tanaga Tanaga Bay	Coastal Waters South of Adak, Kanaga, Tanaga	30
	18	18	18	18	19	19	20	21	22- 23	22	23	23- 24	24	24	24	25	25	25	25	25	26	27	27	27	28	28		
Albatross				+									5															
Leucis-winged Duck	7	10		+	+	30			50		2	2	2	1		10		30					7		10	600		
Common Eider		5		100		20			40	7	10		20	28	2			30	3			7	20		10	10		
Merganser								1			3													8				
Common Merganser																												
Golden Eagle	2	1			2	1		2	10	2	2		6	+		+	1	1	2	2	1		5	2	5	4	8	
Peregrine Falcon				1	1	1																	1	1				
Jaeger										1	4										3						1	
Black Oystercatcher									+		5							2	2	2								
American Golden Plover																												
Long-billed Dowitcher									?															1		1		
Black Sandpiper													?								2			1		1		
Phalarope																												
Arctic Jaeger																												
Mucous-winged Gull	10	10				10	10	50	1000	300	5	20	30	+		+	+	5	300	+		5	100		200	5	20	
Red-tailed Tropicbird	5		10			20	100	20	20	+		50	30			+		20	3000	+		5	20		50		100	
Black-legged Kittiwake							+			+		+	+			+												
Red-legged Kittiwake	+						?			+		+	+			+												

Appendix VI.--Checklist of bird sightings made during a marine mammal survey of the Aleutian Islands 16 June to 15 July 1979--continued.

SPECIES	Uliaga	Kagamil	Carlisle	Chuginadak	Herbert	Yunaska	Amukta to Sequam	Sequam	Amia	Tanadak	Amia Svirchnikof Harbor	Atka South Side	Atka Nazam Bay	Sagchudak	Amtagis	Atka North Side	Atka Four Stacks	Atka S. Korovin Bay	Koniuji	Kasatochi	Umak Umak Bight	Ikiginak	Great Sitkin	Great Sitkin Sand Bay	Coastal Waters North of Adak, Kanaga, Tanaga	Tanaga Tanaga Bay	Coastal Waters South of Adak, Kanaga, Tanaga		
	18	18	18	18	19	19	20	21	22-23	22	23	23-24	24	24	24	25	25	25	25	25	25	26	27	27	27	28	28	30	
Aleutian Tern																													
Arctic Tern																													
Murre		+	20		200	20	100	200	100	+		100	30				1000	50	2000	+	10	40	500		200	20	50		
Common Murre					+	+	+	+		+		+	+			+	+	+		+	+								
Thick-billed Murre			+																										
Pigeon Guillemot	10	10	10	40	50	10	20	20	50	+	20	40	20	500	+	+	+	30	200	+	5	10	20	5	50	5	10		
Small Alcids			600	200	400	200	100	20	500			60				+	+	20	300	+		200	1000		200		100		
Ancient Murrelet						+			20			30				+		10					5			10			
Cassin's Auklet																													
Parakeet Auklet			+	+	+	+	+		+	+		30				+	+		+	+			40			+		5	
Crested Auklet			+	+	+	+	+		+							+	+	10	+	+	+	10	5			+			
Least Auklet																							20	50		+		10	
Whiskered Auklet												1																	
Horned Puffin	20	40	40	100	50	20	10	50	20	+	2	20	2	2000	+	+		5	100	+		10	30		30		10		
Tufted Puffin	100	200	60	300	100	100	200	100	300	+		100	10	+	+	+	+	5	1000	+		90	500		80		20		
Common Raven	2	2		2				3	1		1		3							2							2		
Winter Wren						2		2	2		1																2		

Appendix VI.--Checklist of bird sightings made during a marine mammal survey of the Aleutian Islands 16 June to 15 July 1979--continued.

	Gareloi	Tag	Unalga	Ilak-Gramp	Ulak	Amatignak	Semisopchnoi	Semisopchnoi to Amchitka	Amchitka SE	Amchitka N	Amchitka Chitka Bay	Little Sitkin	Davidof & Khvostof	Segula	Ayudadak	Kiska	Amchitka to Atka	N. Amliia	W. Sequam	Amukta	Chagulak	NE Yunaska	Chuginadak Concord Pt.	Bogoslof	
	1	1	1	2	2	2	3	3	3	5	5	6- 7	JULY 7	7	7	8- 9	11	12	13	13	13	14	14	15	
Aleutian Tern																								2	
Arctic Tern									3																
Murre	50	10	10	10	20	20	+	5	10	50		50	500	10	10	70	200	50	10	100	5000		10	5000	
Common Murre	+	+	+				+	+	+	+			+	+											
Thick-billed Murre	+						+						+	+							+	+		+	
Pigeon Guillemot	10	5	30	10	10	10	5		5	10	1	10	10	20	5	5+15	10	10	2	100	200	20	10	100	
Small Alcids	3000	200	1000	200	2000	500	100,000	3000	100	100		30	770	100,000	50	200,000	600	150	60	200	2000			10	
Ancient Murrelet	5					40	30		50	100		30	20	40	5	150	100	50		10	20				
Cassin's Auklet																									
Parakeet Auklet	50	+	10	+	+	+	+	100	10	10		+	200	500	+	40			50	+	+				
Crested Auklet	50	+	5	+	+	+	+	100	10	5		?	50	300	+	5	+	2	+		+				
Least Auklet	200	+		+	+	+	+	1000	40	5		+	500	400	5	10	+		10	+	+		5		
Whiskered Auklet																								+	
Horned Puffin	10	5	10	10	+	+	40	20	20	5		10	100	50	5	40	50	50	10	20	50				
Tufted Puffin	20	5	10	60	+	+	100	40	30	10		50	200	100	5	70	100	50	10	50	100		5	100	
Common Raven											2								3	5		3	1		
Winter Wren											6		1						9						

Appendix VI--Checklist of bird sightings made during a marine mammal survey of the Aleutian Islands 16 June to 15 July 1979--continued.

SPECIES	Ullaga	Kagami	Carlisle	Chuginadak	Herbert	Yunaska	Amukta to Sequam	Sequam	Amia	Tanadak	Amia Sviechnikof Harbor	Atka South Side	Atka Nezam Bay	Sagchudek	Amagis	Atka North Side	Atka Four Stacks	Atka S. Korovin Bay	Koniuji	Kasatochi	Umek Umak Bight	Ikiginak	Great Sitkin	Great Sitkin Sand Bay	Coastal Waters North of Adak, Kanaga, Tanaga	Tanaga Tanaga Bay	Coastal Waters South of Adak, Kanaga, Tanaga
	18	18	18	18	19	19	20	21	22-23	22	23	23-24	24	24	24	25	25	25	25	25	25	26	27	27	27	28	28
Graycrowned Rosy Finch				+			2										+					2		2			
Fox Sparrow								1														1					
Song Sparrow								2		1		1										12					
Lapland Longspur																						2		5		10	

SPECIES	Gareloi	Tag	Unalga	Ilak-Cramp	Ulak	Amatignak	Semisopchnoi	Semisopchnoi to Amchitka	Amchitka SE	Amchitka N	Amchitka Chitka Bay	Little Sitkin	Davidof & Khvostof	Segula	Ayugadak	Kiska	Amchitka to Atka	N. Amia	W. Sequam	Amukta	Chagulak	NE Yunaska	Chuginadak Concord Pt.	Bogoslof
	1	1	1	2	2	2	3	3	3	5	5	6-7	7	7	7	8-9	11	12	13	13	13	14	14	15
Graycrowned Rosy Finch																								
Fox Sparrow																								
Song Sparrow																								3
Lapland Longspur											5													10
Snow Bunting											5													3

APPENDIX VII. Alphabetical listing of islands referred to in this report.

Island name	Order (east to west)	Table	Page
Adak	38	29	41-42
Aglgiadak	12	12	24
Amatignak	54	43	55
Amchitka	56	45	58-59
Amlia	15	15	25-27
Amtagis	17	17	30
Amukta	10	10	19-20
Anagaksik	28	26	36
Andreanof Islands			21-46
Asuksak	33		39
Atia	16	16	28-29
Ayuqadak	62	48	62-63
Aziak	34		40
Bobrof	40	31	45
Boqoslof	1	1	13
Carlisle	6	6	16
Chagulak	9	9	19
Chuqinadak	5	5	15-16
Chugul	26		35
Davidof	58		60
Delarof Islands			47-55
Dinkum Rocks	51	40	52-53
Fenimore Rock	24	24	34
Fire Island	2	2	14
Fox Islands			13-14
Gareoli	49	38	51
Gramp Rock	43	33	47-48
Great Sitkin	30	27	37-38
Herbert	7	7	17
Igitkin	27	25	35
Ikiqinak	23	23	34
Ilak	42		47
Islands of Four Mountains			14-20
Kagalaska	37		41
Kagamil	4	4	15
Kanu	31		39
Kanaga	39	30	43-44
Kasatochi	21	21	32-33
Kavalga	48	37	50-51
Khvostof	60		61
Kiska	67		65-66
Koniuji	20	20	32
Little Kiska	66		65
Little Sitkin	57	46	60
Little Tanaga	36	28	40-41
Ogliuga	47		50
Oglodak	22		33
Pillar Rock	68		67

Island name	Order (east to west	Table	Page
Pyramid	59		60
Rat Island	63	49	63
Rat Islands			56-67
Sagaqik	14	14	25
Sagchudak	18	18	30-31
Salt Island	19	19	31
Sea Lion Rock	64	50	64
Seguam	11	11	21-23
Segula	61	42	61-62
Semisopochnoi	55	44	56-57
Skaqul	46	36	49-50
Tag Islands	45	35	49
Tagalak	25		35
Tanadak (Andreanof Is.)	13	13	24-25
Tanadak (Delarof Is.)	53	47	54
Tanadak (Rat Is.)	65	51	64
Tanaga	41	32	45-46
Tanaklak	32		39
Ugidak	44	34	48
Ulak (Andreanof Is.)	29		36
Ulak (Delarof Is.)	52	41	53-54
Uliaga	3	3	14
Umak	35		40
Unalga	50	39	52
Yunaska	8	8	17-18