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JUNEAU, ALASKA

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MARINE MAMMAL REPORT

by

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Federal Aid in Wildlife Restoration
Project W-14-R-2 and 3, Work Plan G

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WORK PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO: W-14-R-2 and 3 TITLE: Marine Mammal Investigations

WORK PLAN: G TITLE: Sea Lions, Sea Otters, Hair Seals, and Beluga Whales

JOB: 1 TITLE: Sea Lions

PERIOD COVERED: January 1, 1967 to December 31, 1967

ABSTRACT

Harvesting activities were monitored on Sugarloaf Island and Marmot Island where hunters took 4855 sea lion pup pelts. Hunting activity caused a shift of several thousand sea lions from one area of the rookery to another.

RECOMMENDATIONS

Extensive collecting of female reproductive tracts, teeth and supporting data should be made during the winter months for reproductive information which we now lack. Animals will have to be utilized solely for biological information since there currently is no use for the meat or hide of Steller sea lions.

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JOB: 1 TITLE: Sea Lions

PERIOD COVERED: January 1, 1967 to December 31, 1967

OBJECTIVES

To determine factors relating to the breeding biology and productivity of sea lions.

To classify rookery and hauling out grounds in accordance with the types of animals frequenting them.

To obtain data on the movements of sea lions.

To monitor all commercial operations engaged in the harvesting of sea lion pups.

TECHNIQUES

No field work was accomplished on the first three objectives in 1967 as personnel were working on other marine mammal jobs. Sea lion pups harvesting operations were monitored by Department personnel on Sugarloaf Island and Marmot Island during June.

FINDINGS

Sugarloaf Island

Five hunters arrived at Sugarloaf Island on June 8, 1967 and immediately began to harvest the pups available on the island. By June 30 they had completed their harvest and had taken 2180

pelts. The number of pups harvested in previous years is shown in Table I.

Counts were made of the pup population and it is estimated that there was a minimum of 5200 pups born on the island. This represents an increase of approximately 100 percent over the 1966 pup production for the island. The adult sea lion population had been declining on Sugarloaf Island the previous three years and the 1967 population represents a reversal of this trend. In 1966 we thought that harvesting activities may be the major factor affecting the abundance of sea lions on the island but the 1967 harvesting season does not support this hypothesis. It would appear that natural fluctuations in the population on any one island do occur and for reasons yet unknown.

Marmot Island

Four hunters harvested sea lion pups on Marmot Island during June and took 2675 pelts. The total pup production for the island based on ground counts was estimated to be 5900 animals.

Marmot Island has been surveyed the past three years and the number of animals present during June has remained fairly constant. Harvesting activities were carried out during these years. The only apparent change in the rookery is the shifting of several thousand animals from one stretch of beach to another.

When the hunters first arrived on the island in 1965, the southwest beach was occupied by at least 2000 breeding bulls and females with pups. The hunters set up their camp in this area and harvested those pups that were readily available. A number of the females moved out of the area before and after the harvest was completed. In 1966 about 1000 adult animals occupied the same area and in 1967 there were less than 200 there. A mile section of the beach near the center of the island apparently attracted most of these animals for the population there increased at about the same rate the southwest beach population declined. A few winter observations also indicate that the sea lions did not move back to their abandoned beach after the hunters left the island.

Although shifting of the adults may cause considerable crowding in some sections of the rookery it does not appear to affect survival of the pups for the first month at least. Counts made of dead and live pups on crowded beaches are proportionally the same as those on less crowded beaches.

A number of foreign firms expressed interest in harvesting adult sea lions in 1967 but no animals were taken. The Japanese in particular are looking at sea lions as a possible source of protein for their ever expanding human populations.

Table I

Sea Lion Harvest

	1964	1965	1966	1967
Sugarloaf Island	1500	2005	1400	2180
Marmot Island	-	1024	1650	2675
Akutan Island	-	1659	857	-
Jude Island	-	72	-	-
Atkins Island	-	259	-	-
Round Island	-	574	-	-

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WORK PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO. W-14-R-2 and 3 TITLE: Marine Mammal Investigations

WORK PLAN G TITLE: Sea Lions, Sea Otters, Hair Seals and Beluga Whales

JOB: 2 TITLE: Sea Otter

PERIOD COVERED: January 1, 1967 to December 31, 1967

ABSTRACT

Eight sightings of transplanted sea otter representing at least six animals were made by Department personnel near the Klag Bay release site. An experimental harvest of 300 sea otter from Adak and 205 from Amchitka was conducted by Department personnel. The pelts were auctioned along with those harvested in 1962 and 1963 bringing an average price of $161.24 and a maximum of $2300 per pelt. Body measurements are presented. Analysis of skeletal, reproductive and stomach material has not been completed.

RECOMMENDATIONS

Another search of the release site in Southeast Alaska should be made. Additional animals should be transplanted to the Klag Bay area and to other selected areas. Harvests should be conducted annually in areas of extremely high population density. Aerial and ground surveys should be made to determine population status and the impact of the harvests. With the large number of specimens made available, the reproductive rate, survival, pelt quality, food habits, population structure and body condition of animals on different islands should be determined and compared. Limited collections of animals should be made from areas of low population density for comparison.

WORK PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO: W-14-R-2 and 3 TITLE: Marine Mammal Investigations

WORK PLAN: G TITLE: Sea Lions, Sea Otters, Hair Seals and Beluga Whales

JOB: 2 TITLE: Sea Otter

PERIOD COVERED: January 1, 1967 to December 31, 1967

OBJECTIVES

To determine population abundance, distribution and trends of sea otter in the coastal areas from Prince William Sound to the Shumagin Islands.

To obtain information relating to the molt, breeding biology and food habits of the sea otter in selected parts of its range.

To refine techniques already developed for transplanting sea otters and to transplant animals to various sites in Southeastern Alaska.

TECHNIQUES

In 1965, twenty-three sea otters were transplanted from Prince William Sound to the Klag Bay area in Southeastern Alaska. An additional 20 sea otters were moved to the same location and 10 were released at Yakutat Bay in 1966. No transplants were undertaken in 1967; however, a search was made of the Klag Bay release area by Departmental personnel. This included a short aerial search of the immediate area and six days of searching from a skiff and from rocks and islands throughout the area from the north side of Khaz Bay to the southern end of Yakobi Island.

In 1962 and 1963, experimental harvests of sea otter were conducted at Amchitka Island. Approximately 500 animals were taken for their pelts to determine the reaction of the fur industry to the pelts and the feasibility of harvests. These pelts were held in cold storage and were not placed on the market immediately. In 1967, the decision was made to harvest an additional 500 animals and to present these with the older pelts in the first significant sale of sea otter pelts in 55 years.

Consequently, Department of Fish and Game personnel killed 300 otter at Adak Island and 205 at Amchitka Island during September and October. The harvest itself, processing of the pelts and marketing were financed by State funds. The collection and processing of biological specimens is being financed by Federal Aid in Wildlife Restoration funds.

Collection

The animals were shot from shore with .243 rifles. When possible, a skiff was used to transport the hunter from place to place, to retrieve dead animals and to transport animals to a central skinning point. At Adak, the MV KITTIWAKE a 72 foot vessel was used as a main base and skiffs were used for all hunting. At Amchitka, a skiff was used when weather permitted and at other times hunting was done from shore in areas where the wind would bring dead animals to shore. A small rubber life raft proved very useful for retrieving in some areas.

In general, single animals were selected by the hunter, i.e., males and females without pups. Some pups and females with pups were shot accidentally or when the pup appeared old enough to be on its own. In some cases, these animals were collected intentionally for biological information.

Specimen Collection

Animals were not marked immediately upon retrieval unless there was some specific piece of information noted by the hunter such as a female being accompanied by a pup or an animal observed copulating before it was collected. In these instances a marked plastic tag was attached to a flipper with a safety pin.

The dead otter were then brought to the skinning place. The sex, weight, total length and girth were recorded and a plastic tag with the accession number was attached to a flipper. The animal was then skinned and a duplicate tag attached to the hide. The original tag remained with the carcass until processed.

Body Measurements

Weights were taken to the nearest pound on a 100 pound spring scale. Most of the animals were wet when weighed but no allowance was made for this.

Total length was measured from the tip of the nose to the end of the bone in the tail along the contours of the body with a steel tape measure to the nearest centimeter. An attempt was made to keep the animal in a natural, relaxed position without stretching for this measurement. Most Amchitka animals were laid out straight and allowed to sit overnight before being measured.

Girth was measured to the nearest centimeter behind the front legs. Originally, measurements of the tail, hind flipper and ear were taken but there was too much variation due to the methods of measurement to warrant the time involved in making them. As a result, they were abandoned after the second day of harvesting.

When possible, notes were made of animals lactating or any other information which might prove useful. However, because of the many different individuals doing the skinning this information was not always recorded. Consequently, the lack of reference to an individual lactating does not mean that it was not lactating.

Female reproductive tracts were preserved in 10 percent formalin with a numbered tag attached to the left horn of the uterus. Testes were placed in individual plastic bags and preserved with 10 percent formalin. Stomach contents of some animals were emptied into plastic "whirl-pacs" with formalin.

Skulls or the largest fragments of broken skulls, a humerus, a femur and the baculum from males were tied together with string, salted and packaged. Bones from about 100 animals were cleaned at Amchitka. The rest were cleaned later in Anchorage. Salting proved to be an adequate means of preserving unfleshed bones.

Pelt samples were taken from 75 Adak hides and 75 Amchitka hides for microscopic examination to determine stages of molt.

In addition, the individual pelts were traced to the sale in the hope that some of the factors affecting price could be determined. The pelts were sold in an auction at the Seattle Fur Exchange on January 30, 1968.

FINDINGS

The following sightings of transplanted sea otter were made by Department personnel in Southeast Alaska.

July 8, 1967	2 (possibly 3)	Sister Lake	Seen from air
July 9, 1967	1 adult	Black Island	From rocks & boat
July 9, 1967	1♀ w/young pup	Granite Island	From rocks & boat
July 10, 1967	1 adult	S. of Mariad Is.	From rocks
July 13, 1967	1 adult	S. of Granite Is.	From boat (ident. not positive)
July 13, 1967	1 adult	Rocks forming W. side of Khaz Bay	From boat
July 13, 1967	1 adult	W. Side of Khaz Bay	From boat (ident. not positive)

These observations probably represent at least six individuals. All were within 2.5 miles of the release site.

Several sea otter sightings have been reported by private citizens. These seldom can be confirmed although some are probably reliable. Indications are that some animals have spread out over the entire west side of Chichagof Island while a concentration has remained at the release site.

Harvest

An attempt was made to gather the most material that might be useful for determination of age and reproductive status under the conditions of the harvest. Analysis of the specimen material is incomplete with most of the efforts thus far directed toward

developing techniques and becoming familiar with the material. Results will be reported at a later date when sufficient data to be meaningful are available. At the present time, cementum layering in the teeth appears to be the most promising criterion for age determination.

The body measurements, sex and date and location of kill for each animal are presented in Table 1.

Pelt Sale

A total of 920 pelts were offered for sale at the January 30, 1968 auction at the Seattle Fur Exchange. At this writing information is available on the sale of 845 of these pelts. Prices for these pelts ranged from a minimum of $40 to a maximum of $2300 with an average of $161.24 per pelt.

The pelts were sold in lots averaging five pelts apiece. These lots were made up of pelts of similar coloration and size without respect to date of harvest or sex. The price of any one pelt was influenced by the quality of the other pelts in the same lot. For this reason it is difficult to determine some of the factors affecting price and quantitative comparisons based on price are almost impossible. The one factor which definitely had a marked influence on price was age of the pelt. Pelts held in cold storage since 1962 and 1963 were easily recognized by the buyers and brought a much lower price. Differences between pelts taken at different times of year as from different islands were not evident in the prices.

TABLE I - Measurements of Sea Otter Harvested - 1967

Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-50-67-1	9/10	Bay of Is., Adak	♀	45	130	50	W/pup
2	9/10	" " " "	♂	21	96	40	Pup of SO-50-67-1
3	9/10	" " " "	♂	75	153	59	
4	9/10	" " " "	♂	71	147	58	
5	9/10	" " " "	♂	75	153	62	
6	9/10	" " " "	♂	79	151	64	
7	9/10	" " " "	♀	47	134	50	
8	9/10	" " " "	♂	81	146	63	
9	9/10	" " " "	♀	37	125	49	W/pup
10	9/10	" " " "	♀	50	137	50	
11	9/10	" " " "	♀	38	127	50	
12	9/10	" " " "	♀	37	128	46	
13	9/10	" " " "	♀	35	124	44	
14	9/10	" " " "	♀	39	130	48	
15	9/10	" " " "	♀	42	126	49	
16	9/10	" " " "	♂	78	151	64	
17	9/10	" " " "	♀	42	129	49	
18	9/10	" " " "	♀	25	102	42	
19	9/10	" " " "	♂	75	142	69	
20	9/10	" " " "	♂	67	142	58	
21	9/10	" " " "	♂	74	140	63	
22	9/10	" " " "	♀	51	131	53	
23	9/10	" " " "	♀	42	126	51	
24	9/10	" " " "	♀	30	111	45	
25	9/10	" " " "	♂	80	150	68	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-25	9/10	Bay of Is., Adak	♂	80	150	68	
26	9/10	" " " "	♂	89	151	68	
27	9/10	" " " "	♂	63	139	58	
28	9/10	" " " "	♀	51	135	50	
29	9/10	" " " "	♀	44	127	49	
30	9/10	" " " "	♂	87	144	64	
31	9/10	" " " "	♀	29	107	46	
32	9/10	" " " "	♀	49	131	53	
33	9/10	" " " "	♀	26	100	42	
34	9/10	" " " "	♀	46	127	58	
35	9/10	" " " "	♀	48	134	49	
36	9/10	" " " "	♀	47	121	49	
37	9/10	" " " "	♂	70	148	63	
38	9/10	" " " "	♀	36	118	48	
39	9/10	" " " "	♀	51	133	58	
40	9/10	" " " "	♀	40	119	56	
41	9/10	" " " "	♀	50	131	56	
42	9/10	" " " "	♀	44	132	44	
43	9/10	" " " "	♀	29	125	35	
44	9/10	" " " "	♀	44	132	46	
45	9/10	" " " "	♂	74	150	56	
46	9/10	" " " "	♀	46	142	44	
47	9/10	" " " "	♀	32	119	40	
48	9/10	" " " "	♀	35	132	42	
49	9/10	" " " "	♀	36	125	47	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
S0-67-50	9/10	Bay of Is., Adak	♀	48	140	48	
51	9/11	" " " "	♀	38	127	45	
52	9/11	" " " "	♀	26	107	41	
53	9/11	" " " "	♂	62	140	58	
54	9/11	" " " "	♀	49	137	52	
55	9/11	" " " "	♀	46	128	51	
56	9/11	" " " "	♀	51	139	55	
57	9/11	" " " "	♀	43	125	48	
58	9/11	" " " "	♂	66	143	58	
59	9/11	" " " "	♀	30	117	41	
60	9/11	" " " "	♀	50	128	51	
61	9/11	" " " "	♀	42	128	50	
62	9/11	" " " "	♂	67	139	57	
63	9/11	" " " "	♀	52	138	51	W/pup, lactating
64	9/11	" " " "	♀	43	135	46	
65	9/11	" " " "	♀	47	130	49	
66	9/11	" " " "	♀	51	134	50	
67	9/11	" " " "	♀	54	140	45	
68	9/11	" " " "	♀	45	132	47	W/pup
69	9/11	" " " "	♂	12	84	28	Pup of S0-67-73
70	9/11	" " " "	♂	59	150	57	
71	9/11	" " " "	♀	46	127	42	
72	9/11	" " " "	♀	40	123	44	
73	9/11	" " " "	♀	40	124	43	W/pup S067-69
74	9/11	" " " "	♀	43	129	46	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-75	9/11	Bay of Is., Adak	♀	41	126	39	
76	9/11	" " " "	♂	85	147	66	
77	9/11	" " " "	♀	38	124	41	
78	9/11	" " " "	♀	47	128	53	
79	9/11	" " " "	♀	50	145	47	
80	9/11	" " " "	♂	71	145	55	
81	9/11	" " " "	♀	48	131	46	
82	9/11	" " " "	♀	42	127	45	
83	9/11	" " " "	♀	43	130	44	
84	9/11	" " " "	♀	45	132	50	
85	9/11	" " " "	♂	69	143	56	
86	9/11	" " " "	♀	45	127	50	
87	9/11	" " " "	♀	42	117	56	
88	9/11	" " " "	♀	40	127	49	
89	9/11	" " " "	♂	73	151	61	
90	9/11	" " " "	♀	44	126	47	
91	9/11	" " " "	♀	47	134	52	
92	9/11	" " " "	♀	46	133	50	
93	9/11	" " " "	♀	45	129	48	
94	9/11	" " " "	♂	55	131	59	
95	9/11	" " " "	♀	43	127	51	
96	9/11	" " " "	♀	47	126	49	
97	9/11	" " " "	♀	38	122	46	
98	9/11	" " " "	♀	41	127	47	
99	9/11	" " " "	♀	51	137	46	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO- 67-100	9/11	Bay of Is., Adak	♀	37	127	41	
101	9/11	" " " "	♀	48	140	48	
102	9/11	" " " "	♂	75	152	62	
103	9/11	" " " "	♂	68	148	62	
104	9/11	" " " "	♀	50	131	50	
105	9/12	" " " "	♂	37	116	47	
106	9/12	" " " "	♂	75	147	59	
107	9/12	" " " "	♀	74	139	66	
108	9/12	" " " "	♀	41	125	49	
109	9/12	" " " "	♀	46	130	50	
110	9/12	" " " "	♀	19	99	33	
111	9/12	" " " "	♀	36	118	44	
112	9/12	" " " "	♀	47	137	46	
113	9/12	" " " "	♀	48	136	47	
114	9/12	" " " "	♀	48	132	52	
115	9/12	" " " "	♀	39	126	45	
116	9/12	" " " "	♀	46	134	45	
117	9/12	" " " "	♀	41	127	46	
118	9/12	" " " "	♀	56	145	47	
119	9/12	" " " "	♀	40	134	45	
120	9/12	" " " "	♂	79	152	60	
121	9/13	" " " "	♀	54	137	49	
122	9/13	" " " "	♀	38	123	46	W/pup
123	9/13	" " " "	♀	38	124	40	
124	9/13	" " " "	♀	37	122	41	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-125	9/13	Bay of Is., Adak	♀	44	134	40	
126	9/13	" " " "	♀	40	123	42	
127	9/13	" " " "	♀	53	130	46	
128	9/13	" " " "	♀	41	124	46	
129	9/13	" " " "	♀	39	122	40	
130	9/13	" " " "	♀	53	128	48	
131	9/13	" " " "	♂	89	160	62	
132	9/13	" " " "	♀	44	129	46	Lactating
133	9/13	" " " "	♀	52	138	44	
134	9/13	" " " "	♂	68	144	54	
135	9/13	" " " "	♀	50	135	49	
136	9/13	" " " "	♀	40	126	43	
137	9/13	" " " "	♀	44	130	45	
138	9/13	" " " "	♀	63	137	44	
139	9/13	" " " "	♂	29	106	38	Pup of SO-67-155
140	9/13	" " " "	♀	38	125	44	
141	9/13	" " " "	♂	20	101	32	Pup of SO-67-156
142	9/13	" " " "	♀	37	125	45	
143	9/13	" " " "	♀	45	133	49	
144	9/13	" " " "	♀	36	123	40	W/pup
145	9/13	" " " "	♀	46	130	44	
146	9/13	" " " "	♀	45	130	51	
147	9/13	" " " "	♀	41	131	45	
148	9/13	" " " "	♀	47	136	46	
149	9/13	" " " "	♀	34	115	41	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-150	9/13	Bay of Is., Adak	♀	48	137	43	
151	9/13	" " " "	♂	69	150	55	
152	9/13	" " " "	♀	56	134	53	
153	9/13	" " " "	♀	39	126	42	
154	9/13	" " " "	♀	46	133	58	
155	9/13	" " " "	♀	52	137	48	W/pup #SO-67-139
156	9/13	" " " "	♀	40	125	41	W/pup #SO-67-141
157	9/13	" " " "	♀	50	136	45	
158	9/13	" " " "	♀	47	136	46	
159	9/13	" " " "	♀	42	128	46	
160	9/13	" " " "	♂	58	143	57	
161	9/13	" " " "	♀	45	134	44	
162	9/13	" " " "	♀	41	127	45	
163	9/13	" " " "	♀	43	135	43	
164	9/13	" " " "	♂	30	106	37	
165	9/13	" " " "	♂	74	146	57	
166	9/13	" " " "	♀	30	105	37	
167	9/13	" " " "	♀	48	131	45	lactating
168	9/13	" " " "	♂	75	147	56	
169	9/13	" " " "	♀	18	97	30	
170	9/13	" " " "	♀	42	127	46	
171	9/13	" " " "	♂	68	142	54	
172	9/13	" " " "	♀	44	128	49	
173	9/13	" " " "	♂	70	140	58	
174	9/13	" " " "	♀	57	131	48	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-175	9/13	Bay of Is., Adak	♀	43	124	43	
176	9/13	" " " "	♀	55	137	49	
177	9/13	" " " "	♂	85	142	69	
178	9/13	" " " "	♀	44	129	45	
179	9/13	" " " "	♂	63	141	53	
180	9/13	" " " "	♂	69	146	55	
181	9/13	" " " "	♂	73	143	54	
182	9/13	" " " "	♀	45	129	45	
183	9/13	" " " "	♀	56	140	52	
184	9/13	" " " "	♀	21	101	34	
185	9/13	" " " "	♂	85	151	62	
186	9/13	" " " "	♀	50	138	49	
187	9/13	" " " "	♀	55	141	46	
188	9/13	" " " "	♀	55	133	53	
189	9/14	" " " "	♀	33	119	39	
190	9/14	" " " "	♀	40	127	42	
191	9/14	" " " "	♂	50	139	47	
192	9/14	" " " "	♀	45	130	45	
193	9/14	" " " "		81	148	62	
194	9/14	" " " "	♀	41	122	46	
195	9/14	" " " "	♂	60	135	63	
196	9/14	" " " "	♀	50	137	48	
197	9/14	" " " "	♀	35	121	39	
198	9/14	" " " "	♂	66	136	59	
199	9/14	" " " "	♀	43	134	47	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-200	9/14	Bay of Is., Adak	♂	74	146	61	
201	9/14	" " " "	♀	65	135	47	
202	9/14	" " " "	♀	44	134	43	
203	9/14	" " " "	♀	44	127	43	
204	9/14	" " " "	♀	42	127	42	
205	9/14	" " " "	♀	41	130	45	
206	9/14	" " " "	♀	55	132	53	Copulating
207	9/14	" " " "	♀	17	88	33	
208	9/14	" " " "	♀	42	128	44	
209	9/14	" " " "	♀	51	135	49	
210	9/14	" " " "	♂	78	145	61	
211	9/14	" " " "	♀	44	132	43	
212	9/14	" " " "	♀	46	122	45	
213	9/14	" " " "	♂	62	136	55	
214	9/14	" " " "	♂	24	106	33	
215	9/14	" " " "	♀	36	127	41	
216	9/14	" " " "	♂	65	138	58	
217	9/14	" " " "	♀	44	131	43	
218	9/14	" " " "	♂	64	142	60	
219	9/14	" " " "	♀	37	122	42	
220	9/14	" " " "	♀	34	119	40	
221	9/14	" " " "	♂	21	103	33	
222	9/14	" " " "	♀	46	137	46	
223	9/14	" " " "	♀	42	129	41	Lactating

CONTINUED

Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-224	9/14	Bay of Is., Adak	♂	69	139	56	
225	9/14	" " " "	♀	40	129	44	
226	9/14	" " " "	♀	41	130	43	
227	9/14	" " " "	♀	37	119	45	
228	9/14	" " " "	♂	63	146	54	Copulating
229	9/14	" " " "	♀	37	125	45	
230	9/14	" " " "	♂	68	141	62	
231	9/14	" " " "	♀	43	134	42	
232	9/14	" " " "	♀	38	123	45	Copulating
233	9/14	" " " "	♀	36	127	43	
234	9/14	" " " "	♀	44	137	42	
235	9/14	" " " "	♀	57	138	48	
236	9/14	" " " "	♀	60	137	55	
237	9/14	" " " "	♀	47	139	49	
238	9/14	" " " "	♀	46	133	41	
239	9/15	" " " "	♀	36	122	40	
240	9/15	" " " "	♀	19	95	33	
241	9/16	" " " "	♀	44	132	45	
242	9/16	" " " "	♀	49	134	45	
243	9/16	" " " "	♂	51	131	47	
244	9/16	" " " "	♀	39	129	46	
245	9/16	" " " "	♀	43	128	41	
246	9/16	" " " "	♀	53	138	51	
247	9/16	" " " "	♀	46	136	47	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-248	9/16	Bay of Is., Adak	♂	80	153	59	
249	9/16	" " " "	♀	45	126	45	
250	9/16	" " " "	♀	40	128	42	
251	9/16	" " " "	♂	78	153	55	
252	9/16	" " " "	♀	46	134	48	
253	9/16	" " " "	♀	37	125	43	
254	9/16	" " " "	♀	31	114	39	
255	9/16	" " " "	♂	70	144	61	
256	9/16	" " " "	♀	30	112	43	
257	9/16	" " " "	♂	59	133	51	
258	9/16	" " " "	♀	52	136	48	
259	9/16	" " " "	♀	37	127	40	
260	9/16	" " " "	♂	66	140	53	
261	9/16	" " " "	♂	65	153	51	
262	9/16	" " " "	♀	47	136	49	
263	9/16	" " " "	♀	42	123	44	
264	9/16	" " " "	♂	71	141	55	
265	9/16	" " " "	♀	32	120	38	
266	9/16	" " " "	♀	45	129	47	
267	9/16	" " " "	♀	40	128	43	
268	9/16	" " " "	♀	50	137	49	
269	9/16	" " " "	♀	31	118	38	
270	9/16	" " " "	♂	35	115	41	
271	9/16	" " " "	♀	36	119	40	

CONTINUED

Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-272	9/16	Bay of Is., Adak	♂	62	137	55	
273	9/16	" " " "	♂	25	105	33	
274	9/16	" " " "	♀	39	125	42	
275	9/16	" " " "	♀	43	132	44	
276	9/17	" " " "	♂	78	149	59	
277	9/17	" " " "	♀	44	136	43	
278	9/17	" " " "	♀	38	118	41	
279	9/17	" " " "	♀	40	123	42	
280	9/17	" " " "	♀	52	142	50	
281	9/17	" " " "	♀	51	141	45	
282	9/17	" " " "	♀	31	117	40	
283	9/17	" " " "	♂	65	141	53	
284	9/17	" " " "	♂	32	112	39	
285	9/17	" " " "	♀	49	136	48	
286	9/17	" " " "	♀	49	135	46	
287	9/17	" " " "	♀	51	129	49	
288	9/17	" " " "	♂	73	154	54	
289	9/17	" " " "	♀	54	138	50	
290	9/17	" " " "	♀	48	135	45	
291	9/17	" " " "	♀	43	132	43	
292	9/17	" " " "	♂	67	150	55	
293	9/17	" " " "	♀	43	131	43	
294	9/17	" " " "	♀	45	139	45	
295	9/17	" " " "	♂	72	149	58	
296	9/17	" " " "	♀	46	136	46	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-297	9/17	Bay of Is. Adak	♀	50	138	49	
298	9/17	" " " "	♀	34	130	40	
299	9/17	" " " "	♂	18	91	32	
300	9/17	" " " "	♂	71	143	58	
301	9/22	St. Makarius Beach E., Amchitka	♂	64	141	57	
302	9/23	Constantine Pt., Amchitka	♀	21	107	37	Pup of SO-67-303
303	9/23	Constantine Pt., Amchitka	♀	38	131	47	W/pup SO-67-302
304	9/23	Constantine Pt., Amchitka	♀	41	134	44	
305	9/23	St. Makarius Pt. W., Amchitka	♀	55	136	47	
306	9/23	" " " "	♀	41	134	48	
307	9/23	" " " "	♀	43	126	48	
308	9/23	" " " "	♀	37	124	47	
309	9/24	Crown Reefer Pt., Amchitka	♀	39	123	40	
310	9/24	" " "	♀	38	121	41	
311	9/24	" " "	♂	50	135	48	
312	9/24	" " "	♂	45	128	44	
313	9/24	" " "	♂	60	139	49	
314	9/24	" " "	♂	35	114	40	
315	9/25	Kirilof Bay, Amchitka	♀	22	96	42	Pup of SO-67-316
316	9/25	" " "	♀	44	126	43	W/pup SO-67-315
317	9/25	" " "	♀	42	131	41	
318	9/25	" " "	♀	47	133	46	
319	9/25	" " "	♀	43	128	48	
320	9/25	St. Markarius Pt., W. to E. Cape, Amchitka	♀	57	133	49	

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Accession No.	Date	Location	Sex	Weight (lbs)	Tl. (cm)	Girth (cm)	Remarks
SO-67-321	9/25	St.Makarius Pt.W. to E.Cape, Amchitka	♀	42	131	40	
322	9/25	" " "	♀	44	130	42	
323	9/25	" " "	♀	45	127	46	
324	9/25	" " "	♀	48	127	43	
325	9/25	" " "	♀	43	128	43	
326	9/25	" " "	♀	28	108	34	
327	9/25	" " "	♀	45	129	44	
328	9/25	" " "	♀	51	131	46	
329	9/25	" " "	♀	44	122	46	
330	9/25	" " "	♀	45	133	44	
331	9/25	" " "	♀	38	126	42	
332	9/25	" " "	♀	45	125	46	
333	9/25	" " "	♀	44	127	45	
334	9/25	" " "	♀	50	144	51	
335	9/25	" " "	♀	41	131	42	
336	9/25	" " "	♀	43	131	44	
337	9/25	" " "	♀	35	121	43	
338	9/25	" " "	♀	46	134	44	
339	9/25	" " "	♂	63	139	60	
340	9/25	" " "	♀	39	122	42	
341	9/25	" " "	♀	50	127	50	
342	9/25	" " "	♀	44	130	42	
343	9/25	" " "	♀	43	130	48	Lactating
344	9/25	" " "	♀	45	126	41	
345	9/25	" " "	♀	30	104	37	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
S0-67-346	9/26	Constantine Pt., Amchitka	♂	13	92	30	Pup of S0-67-347
347	9/26	" " "	♀	44	130	45	W/pup S0-67-346
348	9/26	" " "	♀	43	132	43	
349	9/26	" " "	♀	38	130	43	
350	9/26	" " "	♀	42	131	43	
351	9/26	" " "	♂	73	144	58	
352	9/26	" " "	♀	40	128	45	
353	9/27	Kirilof Dock "	♀	38	119	43	
354	9/26	Constantine Pt. "	♀	45	133	46	
355	9/27	" " "	♀	42	128	44	
356	9/27	South Bight "	♀	45	125	46	
357	9/27	" " "	♀	42	130	46	
358	9/27	" " "	♀	34	119	43	
359	9/28	Rifle Range Pt. "	♀	40	126	45	
360	9/28	" " " "	♂	59	141	55	
361	9/28	Kirilof Bay to Crown Reefer Pt., Amchitka	♀	42	128	47	
362	9/28	" " "	♂	70	140	59	
363	9/28	" " "	♂	65	140	58	
364	9/28	" " "	♂	65	148	58	
365	9/28	" " "	♀	49	128	49	
366	9/28	" " "	♀	43	132	46	Lactating
367	9/28	" " "	♂	44	127	47	
368	9/28	" " "	♀	45	128	48	
369	9/28	" " "	♀	33	110	43	
370	9/28	" " "	♀	42	130	43	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-371	9/28	Kirilof Bay to Crown Reefer Pt., Amchitka	♂	45	128	49	
372	9/28	" " "	♀	37	126	43	
373	9/29	Ivakin Pt. "	♀	43	126	44	
374	9/29	" " "	♂	28	104	35	
375	9/29	" " "	♂	55	140	45	
376	9/29	" " "	♀	47	133	44	
377	9/29	" " "	♀	47	133	42	Lactating
378	9/29	Rifle Range Pt., Amchitka	♀	40	129	44	
379	9/29	" " "	♀	39	123	43	
380	9/29	" " "	♀	44	124	47	
381	9/29	" " "	♀	45	131	48	
382	9/29	" " "	♀	45	132	46	
383	9/29	" " "	♀	45	133	46	Lactating
384	9/29	" " "	♀	41	127	46	
385	9/29	" " "	♀	39	120	44	
386	9/29	" " "	♀	46	127	48	
387	9/30	South Bight to E.Cape, Amchitka	♀	51	134	49	
388	9/30	" " "	♀	27	104	37	
389	9/30	" " "	♀	53	135	49	
390	9/30	" " "	♀	48	140	45	
391	9/30	" " "	♀	48	136	48	
392	9/30	" " "	♀	44	127	46	
393	9/30	" " "	♀	44	126	46	
394	9/30	" " "	♀	41	128	45	
395	9/30	Ivakin Pt. to E.Cape, Amchitka	♂	32	114	40	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
S0-67-396	9/30	Ivakin Pt. to E.Cape, Amchitka	♀	53	136	50	
397	9/30	" " "	♀	40	134	44	W/pup, lactating
398	9/30	" " "	♀	42	136	44	Lactating
399	9/30	" " "	♂	63	139	55	
400	9/30	" " "	♂	58	136	53	
401	9/30	" " "	♀	39	128	41	
402	9/30	" " "	♂	58	140	53	
403	9/30	" " "	♀	42	131	45	
404	9/30	" " "	♀	40	128	44	
405	9/30	" " "	♂	33	113	41	
406	9/30	" " "	♀	36	118	41	
407	9/30	" " "	♀	48	128	45	
408	9/30	" " "	♀	48	131	47	
409	9/30	" " "	♂	39	127	41	
410	10/2	Constantine Pt., Amchitka	♂	22	100	37	Pup of S0-67-411
411	10/2	" "	♀	48	130	48	W/pup S0-67-410
412	10/2	" "	♀	37	121	44	
413	10/2	" "	♀	43	125	46	
414	10/3	Kirilof Bay, Amchitka	♀	48	128	47	
415	10/3	" " "	♀	38	124	44	
416	10/3	" " "	♀	51	132	46	
417	10/3	" " "	♀	45	132	45	
418	10/3	" " "	♀	39	125	44	
419	10/4	Constantine Bay, Amchikta	♀	36	118	46	
420	10/4	Kirilof Bay, Amchitka	♂	79	143	56	

CONTINUED

ACCESSION No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-421	10/4	Kirilof Bay, Amchitka	♀	58	142	44	
422	10/4	" " "	♀	52	130	45	
423	10/4	" " "	♂	68	143	58	
424	10/4	" " "	♀	43	123	44	
425	10/4	" " "	♀	48	133	46	
426	10/4	Rifle Range Pt., "	♀	39	126	41	
427	10/4	" " " "	♀	51	127	50	
428	10/4	" " " "	♀	42	124	43	
429	10/4	" " " "	♀	38	126	41	
430	10/4	" " " "	♂	71	148	55	
431	10/4	" " " "	♀	45	137	44	Lactating
432	10/4	" " " "	♀	39	126	42	
433	10/4	" " " "	♀	44	127	45	
434	10/4	" " " "	♀	45	135	43	
435	10/4	" " " "	♀	55	129	50	Lactating
436	10/4	" " " "	♀	48	134	46	
437	10/4	" " " "	♀	42	125	44	
438	10/4	" " " "	♀	50	136	47	
439	10/4	" " " "	♂	30	109	37	
440	10/4	" " " "	♀	45	131	43	
441	10/4	" " " "	♂	62	141	53	
442	10/4	" " " "	♀	42	128	42	
443	10/4	" " " "	♀	48	131	44	
444	10/4	" " " "	♀	42	121	48	
445	10/4	" " " "	♀	51	135	45	

CONTINUED

Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-446	10/4	Rifle Range Pt., Amchitka	♀	45	128	47	
447	10/4	" " " "	♀	32	116	42	
448	10/4	" " " "	♀	45	133	44	
449	10/4	" " " "	♀	43	124	46	
450	10/4	" " " "	♀	47	127	46	
451	10/4	" " " "	♀	48	129	44	Lactating
452	10/4	" " " "	♀	46	134	48	
453	10/4	" " " "	♀	45	129	46	
454	10/5	" " " "	♀	38	124	42	
455	10/5	" " " "	♀	45	134	46	
456	10/5	" " " "	♀	47	129	46	
457	10/5	" " " "	♀	52	138	48	
458	10/5	" " " "	♀	42	124	44	
459	10/5	" " " "	♀	37	122	45	
460	10/5	" " " "	♀	37	116	41	
461	10/5	" " " "	♀	42	126	48	
462	10/5	" " " "	♀	50	134	46	
463	10/5	" " " "	♀	49	134	46	
464	10/5	" " " "	♀	47	133	46	
465	10/5	" " " "	♀	45	125	47	
466	10/5	St. Makarius Pt. W., Amchitka	♀	42	125	45	
467	10/5	" " " "	♀	45	130	46	
468	10/5	" " " "	♀	52	130	49	
469	10/5	" " " "	♀	43	124	46	
470	10/5	" " " "	♀	51	139	44	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-471	10/5	St. Makarius Pt. W., Amchitka	♀	34	116	42	
472	10/5	" " "	♀	53	136	47	
473	10/5	" " "	♀	41	126	44	
474	10/5	" " "	♀	43	130	43	
475	10/5	" " "	♀	48	134	44	
476	10/5	" " "	♀	52	136	46	
477	10/5	" " "	♀	53	124	48	
478	10/5	" " "	♀	49	139	48	
479	10/5	" " "	♂	65	141	53	
480	10/5	" " "	♀	39	121	42	
481	10/5	" " "	♀	45	125	49	
482	10/5	" " "	♀	45	130	47	Lactating
483	10/5	" " "	♀	41	134	46	
484	10/5	" " "	♀	45	131	46	
485	10/5	" " "	♀	42	121	49	
486	10/5	" " "	♀	48	127	47	
487	10/5	" " "	♀	50	138	48	
488	10/6	" " "	♂	12	84	29	
489	10/6	" " "	♀	48	133	47	
490	10/6	" " "	♀	50	130	47	
491	10/6	" " "	♀	52	135	51	
492	10/7	Constantine Pt. "	♀	46	129	48	
493	10/7	" "	♀	54	132	49	
494	10/7	" "	♀	50	133	52	
495	10/7	St. Markarius Bay "	♀	14	90	30	

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Accession No.	Date	Location	Sex	Weight (lbs)	TL (cm)	Girth (cm)	Remarks
SO-67-496	10/7	St. Makarius Bay, Amchitka	♀	50	136	47	
497	10/7	" " " "	♀	53	131	54	Lactating
498	10/7	" " " "	♀	44	135	48	Lactating
499	10/7	" " " "	♂	56	139	51	
500	10/7	" " " "	♀	51	139	51	
501	10/8	" " " "	♂	22	101	33	Pup of SO-67-502
502	10/8	" " " "	♀	48	132	44	W/pup SO-67-501
503	10/8	Constantine Pt. "	♀	41	133	49	W/pup, Lactating
504	10/8	" " "	♀	39	122	47	
505	10/8	Rifle Range Pt. "	♀	34	118	44	
512	11/5	St. Makarius Pt. W. "	♀	47	130	50	Transplant mortality
513	11/24	Ivakin Pt. "	♀	47	127	59	Beach dead

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Federal Aid Coordinator

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John S. Vania
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WORK PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO: W-14-R-2 and 3 TITLE: Marine Mammal Investigations

WORK PLAN: G TITLE: Sea Lions, Sea Otters, Harbor Seals, and Beluga Whales

JOB: 3 TITLE: Harbor Seals

PERIOD COVERED: January 1, 1967 to December 31, 1967

ABSTRACT

An examination of harbor seal pelage specimens collected throughout 1966 and 1967 indicated that molt begins in late August and is completed by late October. Hair wear and broken hair tips begin to appear in March and continues until completion of the molt. Eleven hundred and six seal pups were tagged on Tugidak Island and 180 at Port Heiden. Since August of 1967, no tags have been recovered. Pupping areas on Tugidak Island, Port Heiden, and Port Moller were surveyed by air during June, July, and August. Photographic surveys may be an important counting tool if techniques can be worked out. Commercial operators harvested 700 pups from Tugidak Island, 2,278 from Port Heiden, and 1,435 from Port Moller. The $3.00 bounty on seals was removed in April. Bounty records, hunter interviews, and information from buyers indicated a total 1967 harbor seal harvest of 15-20,000 animals.

RECOMMENDATIONS

Existing closed seasons on adult seals should be maintained to protect animals that are of little commercial value. The harvest of pups in rookery areas should be closely watched and harvest quotas imposed where necessary. Efforts should be made to obtain information on age composition, pup mortality, and reproduction.

WORK PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO: W-14-R-2 and 3 TITLE: Marine Mammal Investigations

WORK PLAN G TITLE: Sea Lions, Sea Otters, Harbor Seals, and Beluga Whales

JOB: 3 TITLE: Harbor Seals

PERIOD COVERED: January 1, 1967 to December 31, 1967

OBJECTIVES

To obtain information on the timing of the molt.

To determine patterns of dispersal and obtain known age specimens.

To determine the current abundance and location of major pupping areas.

To monitor commercial operations engaged in the harvesting of seals.

To maintain current information on the response of hair seal populations to harvesting.

TECHNIQUES

Eighty-one pelage specimens from adult seals were collected at two-week intervals from January 1 to December 31, 1966 and 1967 at a local seal processing plant. Specimens measuring approximately 1 x 3 inches were pinned to a wax block and preserved in 10 percent formalin for 5 days. Median sections, 15mm thick, were cut with a razor blade and examined under a 30X binocular microscope. Each section was evaluated for the presence or absence of pigment in the hair roots and degree of broken and worn hair tips.

Motor scooters equipped with large tires were used on Tugidak Island to rapidly approach seal herds that had hauled-out on the beach. Pups were caught and tagged before they entered the water. A colored nylon tag was attached to the right hind flipper. At Port Heiden, a 16-foot outboard powered skiff was used to approach hauled-out seal herds.

Aerial surveys and ground counts were conducted on Tugidak Island and in the Port Heiden-Port Moller areas of the Alaska Peninsula (Figure 1). A Cessna 180 on floats was utilized in both areas. All surveys were flown at an altitude of 200 to 300 feet and as near to the time of low tide as possible. Aerial photographs were taken from a Grumman Goose flying at 500 to 600 feet. Photographic equipment consisted of a Pentax SLR, 85mm lens and TRI-X film.

Harvest operations were monitored on Tugidak Island and on the Alaska Peninsula. A motor scooter was used to travel to camps where hunters were interviewed at least every three days. At Port Heiden, hunters were also contacted by skiff while working in the field. Hunters at Port Moller were contacted at the completion of each aerial survey of the area.

Information on the total harvest of harbor seals was obtained from bounty records prior to April 1967. Removal of the bounty necessitated the gathering of harvest data by direct contact with hunters and from seal buying stations.

FINDINGS

Molt and Pelt Quality

Pelage specimens were obtained from local buyers and combined with collections made in 1966 to provide an insight on molt and hide quality over a 12-month period. Examination of 81 pelage samples indicates that the annual molt of seals in the southeastern and southcentral areas of the state (Game Management Units 1 - 16) begins in late August and is completed by late October.

Degeneration of hair, i.e., broken and worn hair tips, begins to appear in March and April and continues until completion of the

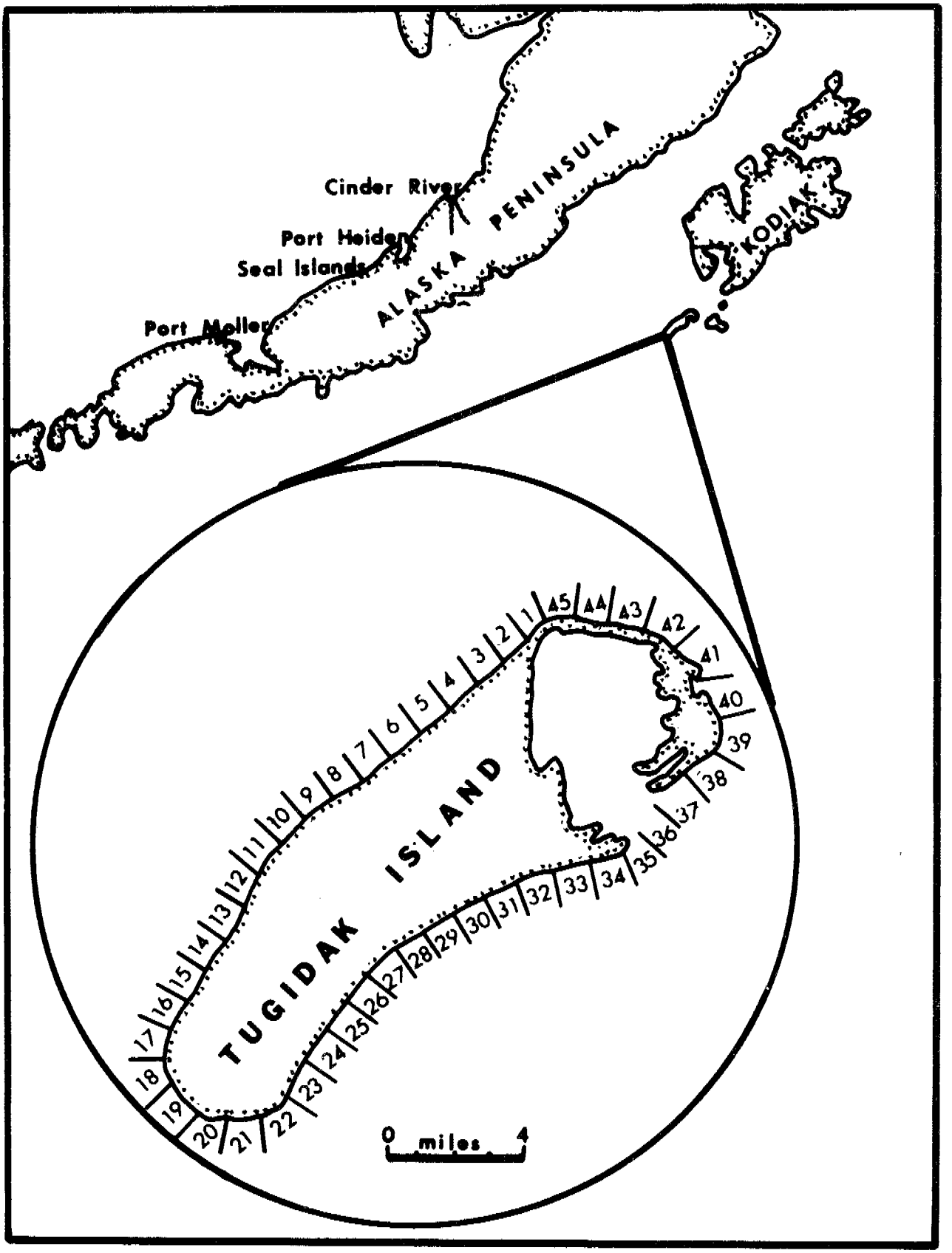

Figure 1. Tugidak Island and 1-mile reference areas

molt. This period of hair wear and molt has a great influence on the quality and price of adult seal pelts. To protect adult seals during these periods, closed seasons, extending from May to July and from August to October in Game Management Units 1 - 16, have been imposed.

Tagging

Seal pups were tagged on Tugidak Island from June 2 to June 21. Eleven hundred and six animals were marked with Jumbo Rototags (Oberarch Patents, Ltd., London, England) made of colored nylon. Tag numbers 3501 to 4500 were red and white and numbers 6000 through 6106 were yellow and blue. Seven hundred and eighty tags were applied in Areas 12 through 16 and 326 in Areas 41 through 43 (Figure 1). Dimensions of the two-piece tags are 2 1/4 X 3/4 inches. All tags were applied to the web of the right hind flipper. Periodic examination of tagged animals revealed that tag loss from wear and abrasion of the flipper did not occur.

Tugidak Island beaches were examined not less than every three days for dead tagged pups and 244 were recovered. Hunters collected 51 tags from July 1 to July 15. Total recovery was 295 animals, or a 27 percent known loss. One additional recovery was a seal pup tagged (#4040) at Tugidak Island on June 11 and recovered in a purse seine at Cape Alitak (a straight line distance of 28 miles) on July 3.

No tagged seals have been recovered from the 300 animals marked in 1966. Also, none were observed on Tugidak Island during the summer of 1967.

In the Port Heiden area, 180 seal pups were tagged (#5501-5681) from June 14 to June 28. Ninety-one tags were recovered by hunters or found dead on the beach. None were recovered outside of Port Heiden Bay.

Although seals were present in large numbers, tagging at Port Heiden proved to be a difficult undertaking. Transportation is by outboard powered skiff and as the season progresses, seals become wary of boats moving in the area. All seals haul-out on exposed sand bars and cannot be approached from concealment. Frequent high winds and heavy seas often prevent boat travel.

Photographic Census

On May 5 an aerial survey was flown on the Alaska Peninsula from Egegik to Port Moller. Photographs were taken of each group of seals seen. Four of 13 photos were of sufficient clarity to make total counts.

Photographic surveys of seals may prove to be an important counting tool if techniques can be worked out. If the aircraft flies below 500 feet, the animals will enter the water before they are reached. Higher altitudes will require photo equipment other than the 85mm lens used on the May 5 survey. Photos should be taken only on high overcast days as bright sunshine causes shadows that appear to be two animals on a photograph. Various types of photo equipment and films will be investigated in 1968.

Population Numbers

On June 18 and June 29, aerial surveys were conducted on Tugidak Island. Additional surveys were not made due to weather and inavailability of aircraft. Results of these counts and surveys in 1965 and 1966 are presented in Table 1.

Surveys conducted in 1965 and 1966 were greatly influenced by hunter activity that caused seals to leave the beaches. Once the animals enter the water they are difficult to count or may be entirely missed. The aerial estimates for 1965 and 1966 reflect hunter disturbance, while in 1967 seals could be found hauled-out in almost any suitable area of the island. Therefore a yearly comparison of aerial estimates is not accurate for determining population trends. The influence of hunter activity on the number of seals seen also applies to surveys conducted on the Alaska Peninsula.

Ground counts were made of hauled-out animals to determine a pup to adult ratio after the peak of pupping had occurred. Eight separate herds containing 1,559 animals were observed during the last week of June. These herds contained 1,025 adults and 534 pups, or a ratio of 53 pups to 100 adults. The number of identifiable males in this group was negligible. These herd counts will be continued to determine if the pup-adult ratio is consistant from year to year and whether or not the ratios can be used in conjunction with aerial surveys to determine the total pup population for the island. For example, a total estimate of

TABLE 1

TUGIDAK ISLAND AERIAL SEAL SURVEYS

Date	1965	1966	1967	Remarks
May 28		500		In areas 13 and 17.
" 30	300			In areas 13 and 17.
June 14	1,000			Throughout all areas*
" 15		3,000		Ground observation.
" 17	8,900	100		1965-4,000 of total in areas 35,36, & 37.
" 18			3,400	Throughout all areas
" 21		1,100		1,000 of total in areas 35-43.
" 22	3,500			2,000 of total in area 34.
" 25	6,650			3,000 of total in areas 33 to 38.
" 26		1,300		800 of total in areas 35 and 36.
" 29			5,100	Throughout all areas.
July 9		3,400		Throughout all areas.
" 19		1,400		1,000 of total in areas 35-44.

* Areas 20 to 33 are unsuitable habitat and are not used by seal.

5,100 animals was made on July 29 on Tugidak Island. If the 53 to 100 ratio is applied, the pup population may have numbered about 2,500 by July 1.

Aerial surveys were flown on the Alaska Peninsula on June 1 and July 18. Inclement weather prevented additional flights. Results of the 1967 counts and surveys conducted in 1965 and 1966 are presented in Table 2.

Pup Harvest

Four individuals were engaged in harvesting seal pups on Tugidak Island. Harvest operations began on July 1 and ended when the season closed on July 31. During this period 700 pups were harvested. Due to the lateness of the season opening, the animals were extremely wary and difficult to catch. Consequently a major portion of the Tugidak Island harvest consisted of deserted pups and animals born in late June and early July.

Three hunting parties operated at Port Heiden and one at Port Moller, with some incidental hunting at Cinder River. The harvest began on July 1 and ended when the season closed on July 31. During this period 2,278 pups were taken at Port Heiden and 1,435 from Port Moller.

All hunters at Port Heiden and Port Moller utilized gillnets to capture seal pups. Nets of 9 1/2 inch stretched mesh were staked-out on sandbars at low tide and tended at low tide the following day. A few animals were taken by shooting with .22 caliber rifles.

Low fur prices and removal of the bounty was responsible for less interest in harvesting seal pups at Tugidak Island and on the Alaska Peninsula than in previous years. Eighteen individuals hunted in 1966 and 22 in 1965. A yearly comparison of the seal pup harvest from Tugidak Island and the Alaska Peninsula is shown in Table 3.

TABLE 2

AERIAL SURVEYS ON THE NORTH SIDE OF THE ALASKA PENINSULA

Date	Port Heiden	Port Moller	Seal Island	Cinder River
1965				
May 19	2,500-3,000	2,500-3,000	-	1,000
July 1	8,000-10,000	-	-	-
August 1	2,500-3,000	-	-	-
1966				
May 31	850	150	-	-
June 7	800	200	1,000	-
June 13	-	1,600	1,000	1,500
June 24	1,500	1,000	500	1,000
June 30	2,500	1,000	1,100	-
July 4	1,600	-	400	-
July 6	2,500	5,000	700	950
July 17	1,200	400	-	-
July 22	650	450	150	-
August 2	750	-	250	2,000
August 5	-	-	-	2,000
1967				
May 5	800	2,400	200	50
June 1	350	210	330	-
July 18	2,300	2,200	500	3,000

TABLE 3

HARBOR SEAL PUP HARVEST

Date	Tugidak	Port Heiden	Port Moller
1965	4,100	4,000	(Includes Port Moller)
1966	2,200	3,100	2,300
1967	700	2,278	1,435

Commercial Seal Harvest

During the 1967 session, the legislature of the State of Alaska amended Alaska Statute 16.35.140 to read:

> BOUNTY ON HAIR SEAL DECLARED. There is a bounty of $3 on every hair seal inhabiting the inland and coastal waters of Alaska west of 159 degrees west longitude or north of 69 degrees north latitude, except the waters south of 58 degrees north latitude.

Essentially this act removed the $3 bounty on seals throughout all of Alaska south of Bristol Bay after April 21, 1967. Bounty claims submitted prior to this date indicated 3,065 seals were taken in Southcentral Alaska (Judicial District III) and 777 in Southeastern Alaska (Judicial District I) from January to April. By comparison, from January to April 1966, bounty records show 2,704 seals taken in Southcentral Alaska and 1,954 from Southeastern Alaska.

Although bounty claims do not give total harvest, they did indicate trends and provided a basis for estimating yearly take. Now that the bounty has been removed, harvest data must be obtained from buying stations and hunter interviews. During calendar 1967, buyers purchased 14,000 seal skins and hunters reported about 1,000 seals that did not enter the commercial market. Therefore, the estimated seal harvest in Southcentral and Southeastern Alaska is between 15-20,000 animals. The 1965 harvest in this area exceeded 50,000 seals and in 1966 about 27,000 were taken.

The decrease in harvest may be attributed to several factors:

1. As is common with all furs, the market and price of skins is subject to fluctuations within the fur industry. A backlog of skins in Europe and unpopular hunting methods in Canada brought prices for Alaskan seal to low levels.

2. Removal of the bounty, coupled with low prices, prompted hunters to pursue other ventures.

3. Seal numbers have decreased in areas easily accessible to hunters. Most hunters are not equipped with vessels capable of making extended hunts in remote areas.

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WORK PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO: W-14-R-2 and 3 TITLE: Marine Mammal Investigations

WORK PLAN: G TITLE: Sea Lions, Sea Otter, Harbor Seals, and Beluga Whales

JOB NO: 4 TITLE: Beluga Whales

PERIOD COVERED: January 1, 1967 to December 31, 1967

ABSTRACT

Killer whale sounds were transmitted underwater in the Naknek River and Kvichak River with an auto tape player and sound projector. No beluga whales entered the Naknek River during nine continuous days of transmitting. During 18 days of transmitting on the Kvichak River the whales generally advance upstream to within one mile of the transmitter and remained there during part of the flood tide. During the last two days of transmitting a few whales passed above the transmitting site.

RECOMMENDATIONS

Sounds other than killer whale noises should be experimented with to determine if belugas react to them in the same manner as they do to the killer whale noises.

WORK PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO: W-14-R-2 and 3 TITLE: Marine Mammal Investigations

WORK PLAN : G TITLE: Sea Lions, Sea Otter, Harbor Seals, and Beluga Whales

JOB NO: 4 TITLE: Beluga Whales

PERIOD COVERED: January 1, 1967 to December 31, 1967

OBJECTIVES

To study the reaction of belugas to various types of underwater sounds transmissions and to gather basic life history data.

TECHNIQUES

Tape recorded sounds of killer whales (Orcinus orca) were transmitted underwater in the Naknek River of Bristol Bay for nine consecutive days starting on May 4 and ending on May 13. On May 25 the transmitting equipment was moved to the Nakeen Cannery on the Kvichak River and was operated intermittently until June 15. The equipment used to transmit the sounds consisted of a A.R.C. 880 auto stero tape deck tape player that had a frequency response of 60-15 KH_z at a tape speed of 3-3/4 ips. The unit utilized a continuous play cartridge. The player contained 13 transistors, was capable of 10 watts of power per channel and was powered by a standard 12 volt auto battery. The player was slightly modified to accommodate the hydrophone projector which had an output impendence of 600 ohms.

The underwater sound projector was a Hydro Products Model DEA-7 hydrophone. The projector consisted of a crystal motor of lead zirconate enclosed in polyethylene. It is capable of handling slightly more than 10 watts and will transmitt frequencies above 35 KH_z.

The program of collecting belugas in the Kvichak River during May and June was discontinued for the rest of 1967.

FINDINGS

As in the two preceeding years the sound producing equipment was again set up on the APA cannery dock on the Naknek River approximately two miles from the entrance. The main channel of the river flowed under the dock allowing transmissions to be made at any time.

Before the equipment was installed belugas had been observed by local residents for about two weeks ascending the river daily on the incoming tide. I observed this pattern of movement upon my arrival at Naknek on May 3.

On May 4 the transmitter was installed on the cannery dock with the sound projector anchored to one of the dock pilings. Wind conditions were calm making for ideal observation conditions. At 7:30 p.m. a large group of whales, possibly 50 or more, were observed with binoculars out in Bristol Bay heading in the direction of the Naknek River. The tide had just began to flood. Because of calm water conditions their direction of movement could be followed easily. Their approach was followed for 45 minutes at which time they were approximately one mile from the river entrance and three miles from the transmitter. The equipment was then activated. All the whales at the surface immediately dove and none were observed for a period of four minutes. When whales were again observed all were moving in a direction away from the transmitting site. Their movements were followed for approximately 10 minutes then could no longer be seen.

An aerial survey of the river entrance was made at 8:45 p.m. and no belugas were observed. Light conditions were becoming very poor and a brief survey of the bay did not turn up any whales.

The transmitter was allowed to run continuously for nine days. Daily observations were made during each flooding tide when light conditions permitted it and no whales were seen during this period. Weather conditions were not always ideal for spotting belugas but it is doubtful any whales ascended the river.

The transmitter was removed from the site on May 13 and observations were discontinued.

On May 25 the transmitting equipment was set up and activated on the Nakeen Cannery dock on the banks of the Kvichak River. Cannery employees had observed belugas ascending the river on each flooding tide and swimming out again during the ebb.

The Kvichak River, one of the largest rivers in Bristol Bay, drains Illiamna Lake which is 1,000 square miles in size. This system is the world's largest producer of red salmon, having runs that exceeded 40 million fish. The river at the transmitting site is approximately 3/4 of a mile wide. Tides of 25 feet flow into the river at this point and greatly affect depth and water condition. The water is always very turbid.

Observations of beluga movements were made with the aid of 7 X 35 binoculars with the observer watching from an elevated position on the river bank.

On May 26 a small group, possibly 10 to 15 whales, was observed entering the river mouth approximately one half hour after the tide began to flood. The whales moved to within a mile of the transmitter, then began to mill around at a place in the river called Telephone Point. At this particular spot a large eddy always formed on the flooding tide. The whales remained at the point for approximately one half hour then were observed swimming out towards the bay against the tide.

The pattern of movement of the belugas remained the same for the following four days. The whales entered the river during the early stages of the flood tide, stopped at Telephone Point and milled around for one-half to one hour then returned to Bristol Bay swimming against the tide.

On June 1 the transmitter broke down and was not repaired until June 4. During this period belugas were observed ascending and decending the river with each flooding and ebbing tide.

On June 4, when the transmitter again became operational the whales reverted to their former pattern of movement and entered the river only as far as Telephone Point.

On three occassions the transmitter was turned off while the whales were milling at Telephone Point. The whales almost immediately began to ascend the river with the incoming tide. When the whales approached within two hundred yards of the trans-

mitter it was again activated. The whales immediately turned and returned down river to Telephone Point.

From June 5 to June 13 the transmitter was operated and whale movements were observed by a temporary employee. During this period the tape player began to malfunction and transmissions were often interrupted. Weather conditions were also poor but when whales were observed all were in the vicinity of Telephone Point.

On June 14 and 15 a large group of whales (100-150) entered the river system during the flooding tide. Observation conditions were not ideal but it was noted that some whales passed above the transmitting site. Most of the whales however remained at Telephone Point during several hours of the flood tide and then were observed swimming out against the tide. Those whales which passed above the transmitting site all did so by first crossing over to the opposite side of the river about a mile below the transmitting site, then proceeded upstream along the opposite bank until they had passed the transmitting site. The river at this point is approximately 3/4 of a mile wide. The experiments were terminated on June 15.

At this point in the experiments it is difficult to determine if the belugas are responding to the transmitted sounds because they recognize them as killer whale noises or if they are reacting simply because they hear a sound that they do not recognize and therefore avoid it. The fact that the whales will move upstream toward the transmitter immediately after the equipment is turned off would indicate they do not recognize the sounds as true killer whale noises.

Experiments designed to determine why the belugas are reacting as they do will have to be conducted. This is necessary for further development of the transmitting gear. The present gear has a maximum range in the Kvichak River of one mile. This range should be extended. If the whales are simply reacting to foreign noises little attention has to be paid to the frequency range and quality of the sounds produced. To get greater range, gear capable of handling more power is all that is needed. The cost of such equipment is relatively inexpensive. If however, the whales are reacting as they do because they recognize the noises as being killer whale sounds any new equipment purchased to increase the volume and therefore range of the gear must take into consideration the frequency response and quality of the sounds reproduced.

Equipment capable of handling 100 watts or more of power and having a broad frequency response is very costly.

The observed whale movements on June 14 and June 15 would seem to indicate that some of the whales had become accustomed to the transmitted noises. If this movement is again observed while transmitting during June 1968, different noises will be tried and the transmitting sites will be shifted from one spot to another to see if this affects any response.

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