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NATIONAL MARINE FISHERIES SERVICE

NORTHWEST FISHERIES CENTER

FUR SEAL INVESTIGATIONS, 1972

by

Marine Mammal Division

National Marine Fisheries Service

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NOTICE

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FUR SEAL INVESTIGATIONS, 1972

by

National Marine Fisheries Service
Marine Mammal Division
Seattle, Washington 98115

ABSTRACT

Field investigations were conducted on the Pribilof Islands and at sea from March to September 1972.

The kill of fur seals was 37,314 males and 79 females.

A count of living adult males in June totaled 6,548; extrapolated estimates yielded 7,603 in July.

Dead fur seals counted consisted of 25,133 pups and 209 animals older than pups.

We marked 25,019 pups of both sexes and recovered 4,029 marked males.

Estimates based on mark-recapture data yielded 551,000 pups born in 1968 and 377,000 in 1969.

Counts of dead pups on three mortality study areas were: Area 1, 73; Area 2, 41; and Area 3, 171.

An additional rookery of northern fur seals was discovered on Castle Rock, a small rocky island near San Miguel Island. Counts of the colony at Adams Cove and the one at Castle Rock show a minimum population of over 600 animals.

In 1972, 849 seals were sighted off Washington and 257 were collected; 25 were males ages 1 to 6 and 232 females ages 1 to 19.

Squids (nine species) were the leading food item (34%); following were northern anchovy, Engraulis mordax (26%); Pacific herring, Clupea harengus pallasi (17%); rockfish, Sebastes sp. (8%); and American shad, Alosa sapidissima (6%). Salmonids (3.7%) were the most valuable commercial fish eaten by fur seals collected off Washington in 1972.

Part I. FUR SEAL INVESTIGATIONS, PRIBILOF ISLANDS, ALASKA, 1972

The objective of fur seal research on the Pribilof Islands is to determine the level at which the herd will produce maximum sustained yield. The investigations satisfy obligations to the "Interim Convention for Conservation of North Pacific Fur Seals" and produce the information needed to manage the resource. This report summarizes the data collected in 1972.

Figures 1 and 2 show the locations of breeding grounds on the Pribilof Islands, and terms having special meanings in fur seal research are described in the glossary. In this report, "Pribilof Islands" includes St. Paul and St. George Islands and, occasionally, Sea Lion Rock. Two of the five Pribilof Islands, Otter and Walrus, do not have fur seal rookeries.

Alton Y. Roppel

AGE CLASSIFICATION AND NUMBER OF SEALS KILLED, BY SEX

In an effort to increase recruitment into the breeding reserve, the commercial utilization of male seals in 1972 was restricted to those with a body length equal to or less than 49 inches (tip of nose to tip of tail). These males were obtained only from accessible hauling grounds. Female seals were not intentionally killed.

From 26 June to 29 July, the harvest was begun at 6 a.m. Monday through Saturday of each week on St. Paul Island, and at 9 a.m. Mondays, Wednesdays, and Fridays on St. George Island.

The kill of males in ages 2 to 6 years totaled 33,110 on St. Paul Island and 4,204 on St. George Island (tables A-1 to A-4). Right upper canine teeth collected from 20 percent of the males killed were used to determine the age composition daily by rookery. The ages of 79 females killed accidentally during the male harvest were not determined.

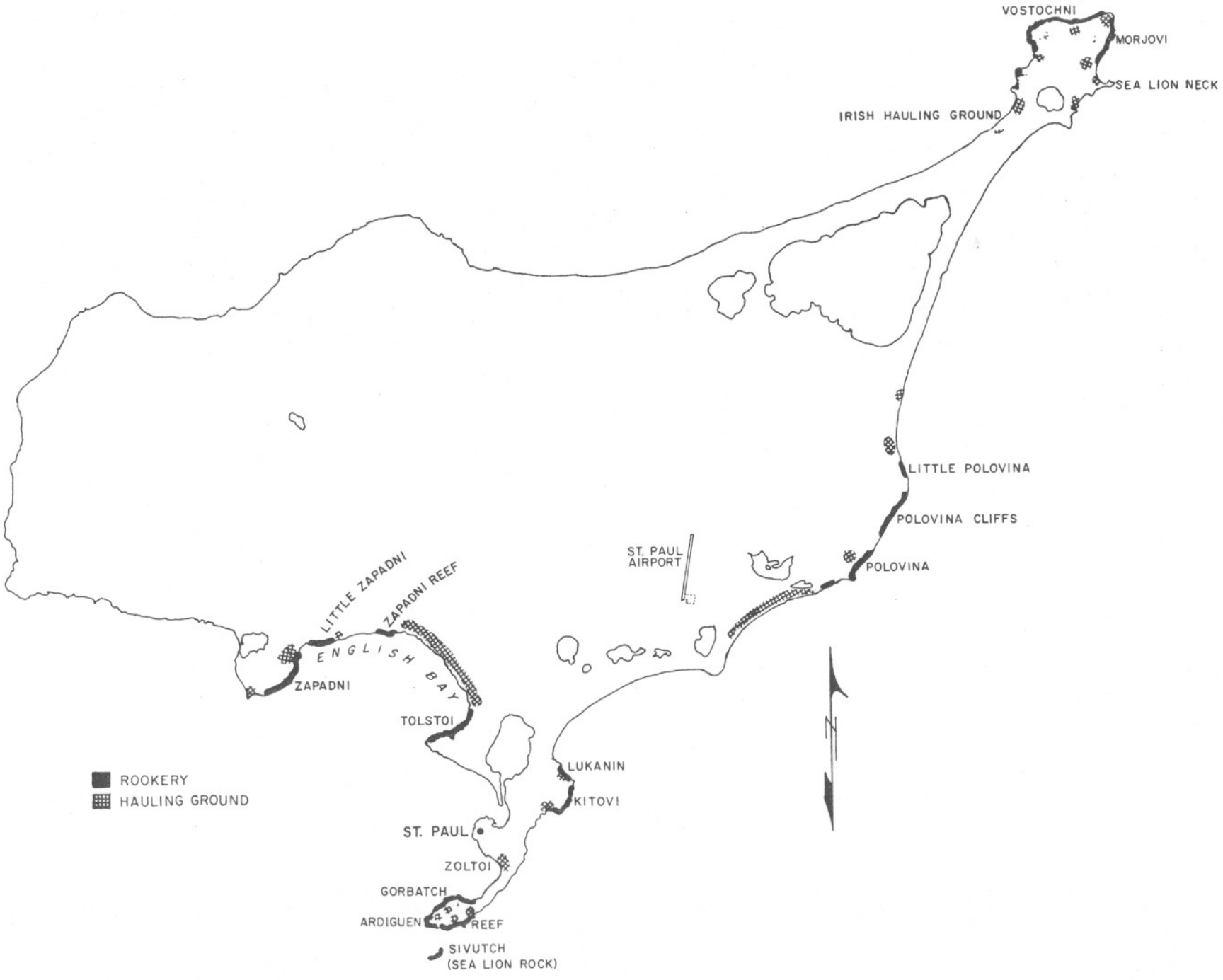


Figure 1.--Location of rookeries and hauling grounds, St. Paul Island.

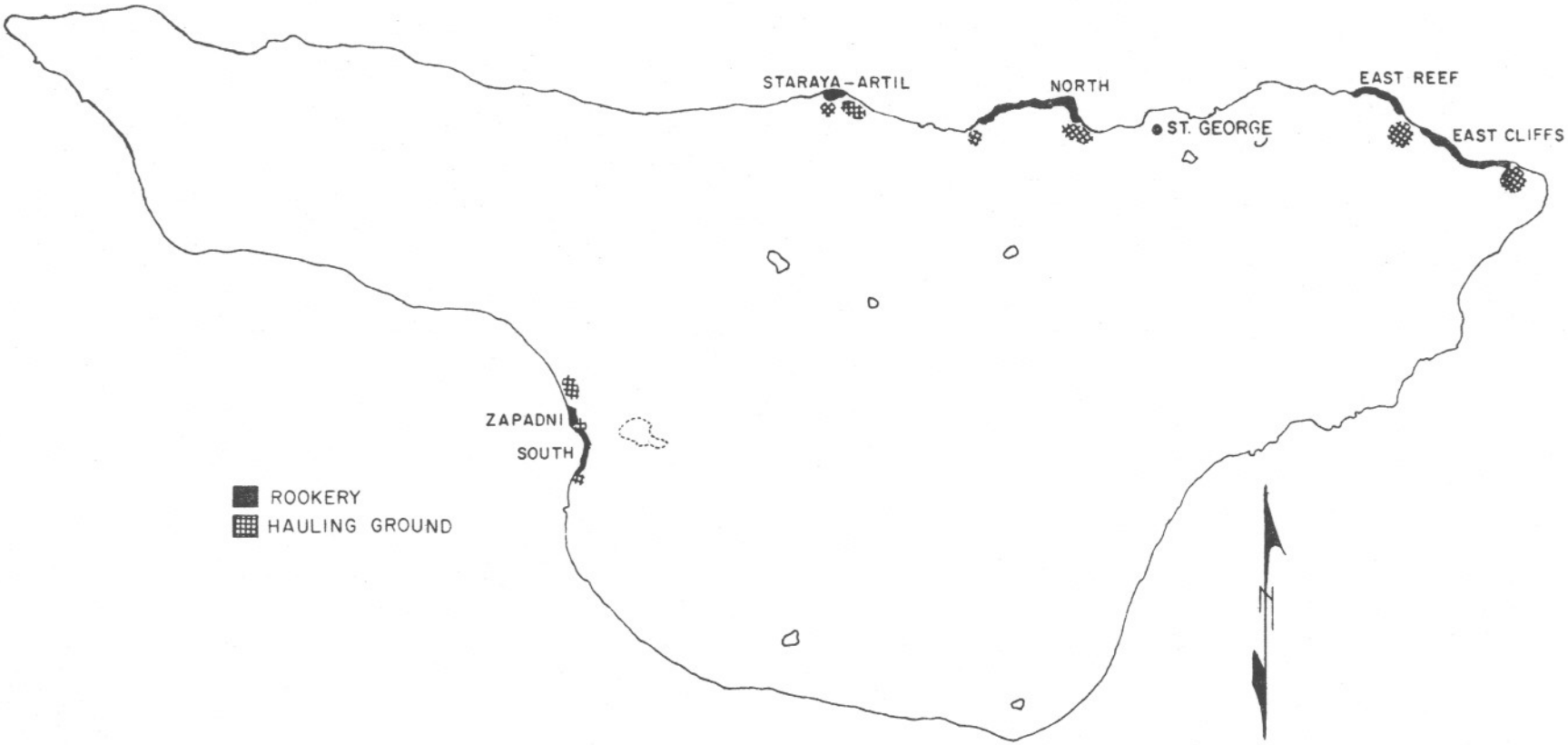


Figure 2.--Location of rookeries and hauling grounds, St. George Island.

Figures 3 and 4, show trends in the availability of 3- and 4-year-old males harvested on St. Paul and St. George Islands in 1972. Males killed on the Pribilof Islands from year classes 1947 to 1970 are given in figure 5, and from year classes 1954 to 1970 in table 1.

Patrick Kozloff

SURVEY DATA

Data collected in 1972 and evaluated as a way of measuring the reaction of the fur seal herd to management techniques included counts of living adult males and dead seals of both sexes and all ages.

Living Adult Male Seals Counted

Living adult males were counted on all rookeries of St. Paul and St. George Islands in June, but only on selected rookeries of both islands in July (tables A-5 to A-10).

Dead Seals Counted That Were Older Than Pups

In 1972, a total of 209 dead males and females were counted on St. Paul and St. George Islands. Canine teeth collected from most of the seals (some animals had lost their canines) will be used for age distribution and mortality studies. Table 2 gives the number of dead seals counted each year by sex and island since 1965.

Dead Pups Counted

In 1972, the number of dead pups counted from 21 August to 1 September on St. Paul and St. George Islands was 22,469 and 2,484, respectively (table A-11). Table A-12 gives the number of dead pups counted from 1963 to 1972 plus an estimated 5% addition for animals overlooked.

Patrick Kozloff and
Ancel Johnson

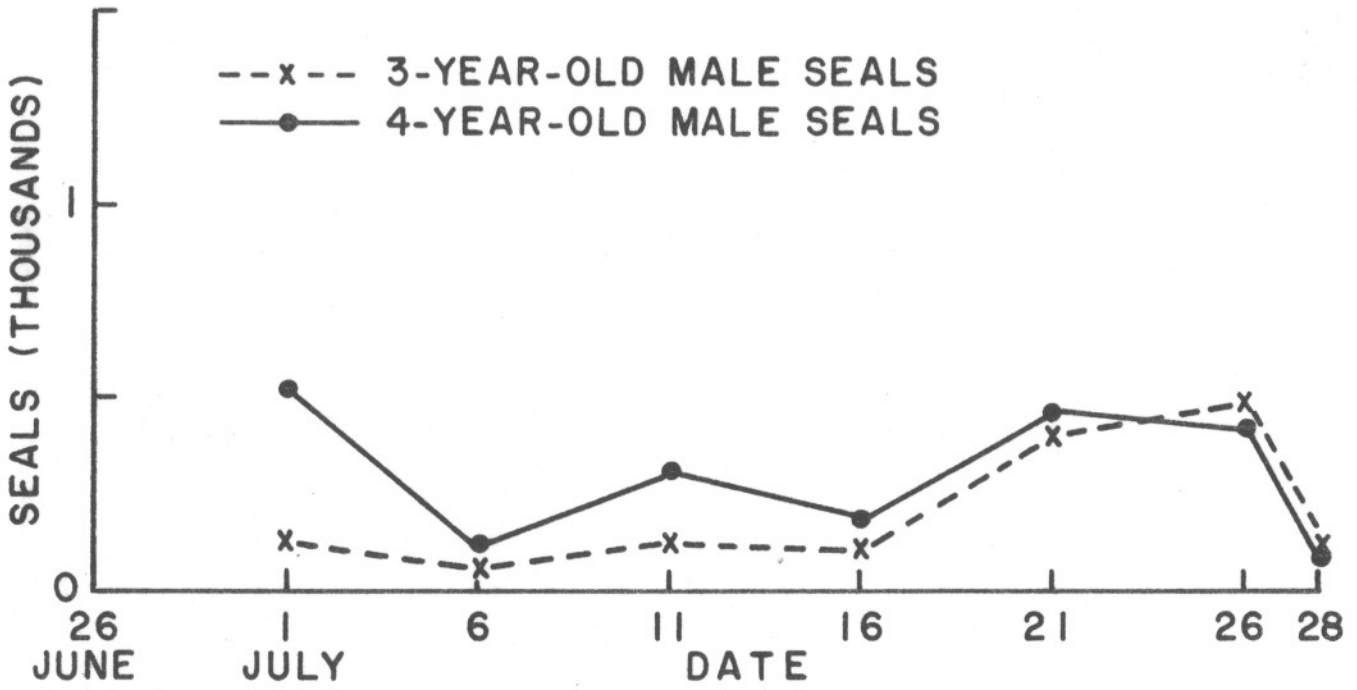


Figure 3. --Three- and four-year-old male seals killed, St. Paul Island, 26 June to 29 July 1972.

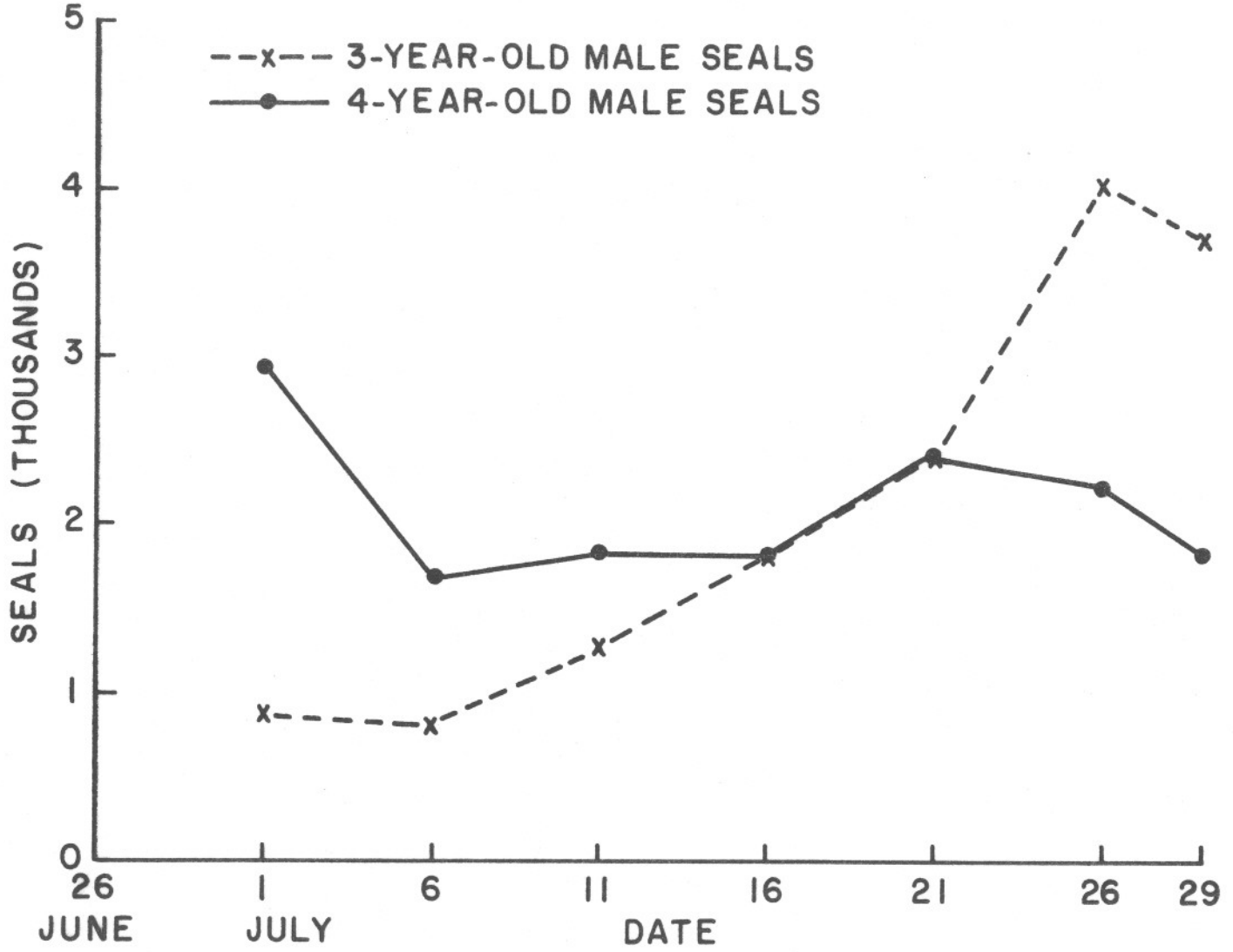


Figure 4. --Three- and four-year-old male seals killed, St. George Island, 26 June to 28 July 1972.

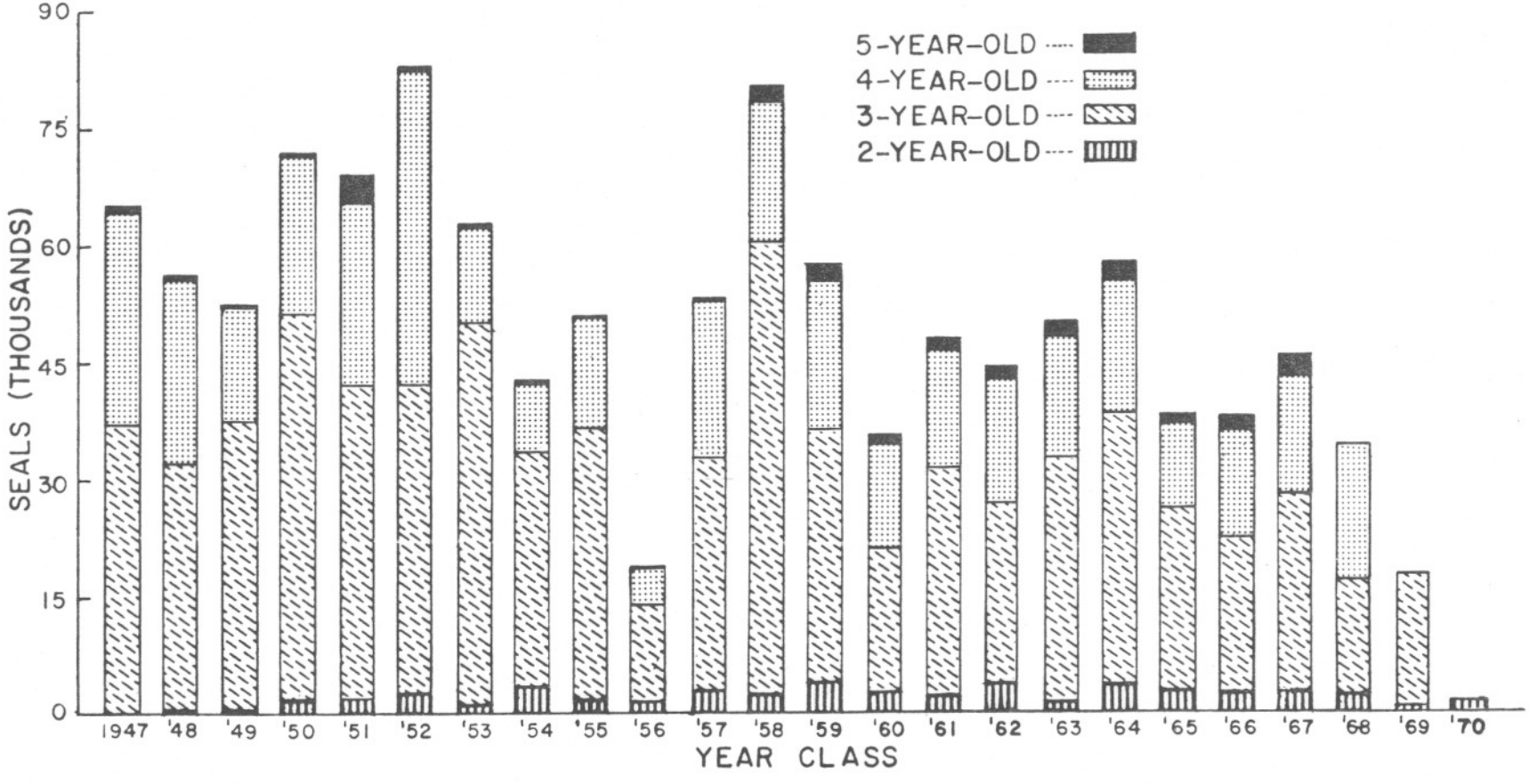


Figure 5.--Kill of male seals, by year class, Pribilof Islands, Alaska, 1947-70.

Table 1.--Kill of male seals, [1/] by year class, Pribilof Islands, Alaska, 1954-70

Year class	St. Paul Island					St. George Island					Grand total
	Age when killed					Age when killed					
	2	3	4	5	Total	2	3	4	5	Total	
	Number					Number					Number
1954	2,918	23.473	5,599	554	32,544	535	6,651	2,779	162	10,127	42,671
1955	1,015	27,863	10,555	115	39,548	555	7,246	2,825	260	10,886	50,434
1956	885	10,671	2,762	532	14,850	171	2,251	1,387	218	4,027	18,877
1957	2,590	24,283	15,344	773	42,990	242	5,098	4,492	244	10,076	53,066
1958	1,977	48,458	14,149	1,587	66,171	431	9,413	3,707	540	14,091	80,262
1959	2,820	26,456	14,184	1,764	45,224	891	5,890	4,690	492	11,963	57,187
1960	1,619	14,310	10,533	1,240	27,702	636	4,332	2,579	178	7,725	35,427
1961	1,098	22,468	12,046	1,270	36,882	921	6,948	2,592	502	10,963	47,845
1962	2,539	19,009	12,156	1,287	34,991	1,139	3,736	3,881	392	9,148	44,139
1963	1,264	25,535	11,785	1,542	40,126	167	5,586	3,738	406	9,897	50,023
1964	3,143	26,991	13,279	1,469	44,882	391	7,622	3,680	680	12,373	57,255
1965	2,200	18,706	10,565	731	32,202	740	4,443	2,204	547	7,934	40,136
1966	1,673	17,826	11,548	1,338	32,385	443	2,645	2,274	467	5,829	38,214
1967	2,640	22,176	12,503	2,185	39,504	411	2,916	2,517	559	6,403	45,907
1968[2/]	1,725	12,888	14,932	--	29,545	98	1,456	2,125	--	3,679	33,224
1969[2/]	323	15,024	--	--	15,347	32	1,442	--	--	1,474	16,821
1970[2/]	916	--	--	--	916	57	--	--	--	57	973
Total	31,345	356,137	171,940	16,387	575,809	7,860	77,675	45,470	5,647	136,652	712,461
Mean	1,844	22,259	11,463	1,171	[3/]37,857	462	4,855	3,031	403	[3/]9,389	[3/]47,246

1/ Includes only age 2- to 5-year-old seals taken during the kill of male seals on the Pribilof Islands. From 1956 to 1970, 131 1-year-olds and 945 6-year-olds were taken on St. Paul Island and 20 1-year-olds and 510 6-year-olds were taken on St. George Island. In addition, age was not determined for 4,919 males taken on St. Paul Island, nor for 1,522 taken on St. George Island.

2/ Incomplete returns.

3/ 1968, 1969, and 1970 year classes not included.

Table 2.--Dead seals counted that were older than pups, Pribilof Islands, Alaska, 1965-72

Year	St. Paul Island		St. George Island		Total	
	Males	Females	Males	Females	Males	Females
	-----Number-----		-----Number----		-----Number-----	
1965	158	No count	No count	No count	158	No count
1966	181	172	41	55	222	227
1967	108	157	41	28	149	185
1968	98	141	33	22	131	163
1969	94	141	22	29	116	170
1970	52	124	4	53	56	177
1971	39	91	5	37	44	128
1972	46	111	22	30	68	141

PATHOLOGY

Since 1964 we have monitored the magnitude and causes of mortality among newborn fur seals on a section of Reef Rookery designated as study area 1 (Marine Mammal Biological Laboratory, 1969) and two additional study areas since 1967 designated as study areas 2 and 3. [1/] The pups found dead on these areas in 1972 were counted but not necropsied. Counts through 15 August were: area 1, 73; area 2, 41; and area 3, 171. These data are similar to those recorded for these areas in 1969 and 1970.

Necropsies on all pups that died within the boundaries of these study areas from late June to mid-August from 1967 through 1971 has given us 5 years of comparative data during a period when the fur seal population has been held at an artificially low level.

In 1972 emphasis was placed on microbiological investigations of infectious disease agents in cooperation with a team of microbiologists from the Naval Biomedical Research Laboratory, Oakland, Calif. These investigations are still in progress and, when completed, will be reported on separately.

In conjunction with collecting specimens for microbiological examination, from 9 July to 15 August all dead pups within study area 3 were retrieved, tagged, and put back in place so that the rate of disappearance from decomposition and scavenging could be measured. Large tags, originally designed for sea lions, were placed through the bones and ligaments of one carpal joint to insure their retention as long as the carcass was recognizable as an individual seal.

On 21 August, during annual counts of dead pups, 135 pups with tags or tags were noted within the study area which had been freshly delineated with painted markers. A total of 162 pups had been tagged and left in place; therefore, 27 (17.2%) tagged pups had become obscure or disappeared. For the most part these apparently represented pups that died approximately 30 days or more before the annual count was made, judging by the pattern of tag recoveries. Most of the tags (71 of 95) put on after 25 July were recovered. In 1970, a similar test gave the following results; of 43 carcasses tagged on 1 August, all were counted 6 August and 41 were counted 13 August. It appears that the time lapse between death of the pup and when the count is made is a factor that contributes to variability of counts and decreases their accuracy.

Mark C. Keyes

1/ Marine Mammal Biological Laboratory. 1972. Fur seal investigations, 1971. National Marine Fisheries Service, Seattle, Wash. [Processed report, 132 p.]

MARKING

Estimates of year-class size and studies of growth, survival, mortality, distribution at sea, homing tendency, and behavior are based on mark-recapture data.

Application of Marks

Since 1941 several kinds of marks have been used on fur seals of both sexes and at various ages. Tables A-13 and A-14 give the number of pups marked by various methods since 1963, and table A-15 shows male seals marked with tags in estimated ages 1 and 2 years since 1961. Figures 6 and 7 illustrate examples of mark locations.

Pups

In 1972, pups were marked by removing the tip of the first digit from a hind flipper. The left hind flippers of 5,000 pups on St. George Island were marked in August, and in September 20,019 pups on St. Paul Island were marked on the right hind flipper. Marking quotas were distributed among the rookeries according to the distribution of class 3 males in mid-July of 1970.

Patrick Kozloff

Marking and Recapture

Recapture of Marked Seals

Marked seals recovered in 1972 are listed in tables A-16 to A-18. The incidence of tag loss based on recovery of animals given two tags or one tag and an additional mark are shown in tables 3 and 4.

The rate of tag loss appears to be greatest during the first year of life and then continues at a lower annual rate. If the time elapsed since tags were applied is considered, the rates of loss among tags applied to pups and to animals older than pups appear to differ little.

Ancel M. Johnson

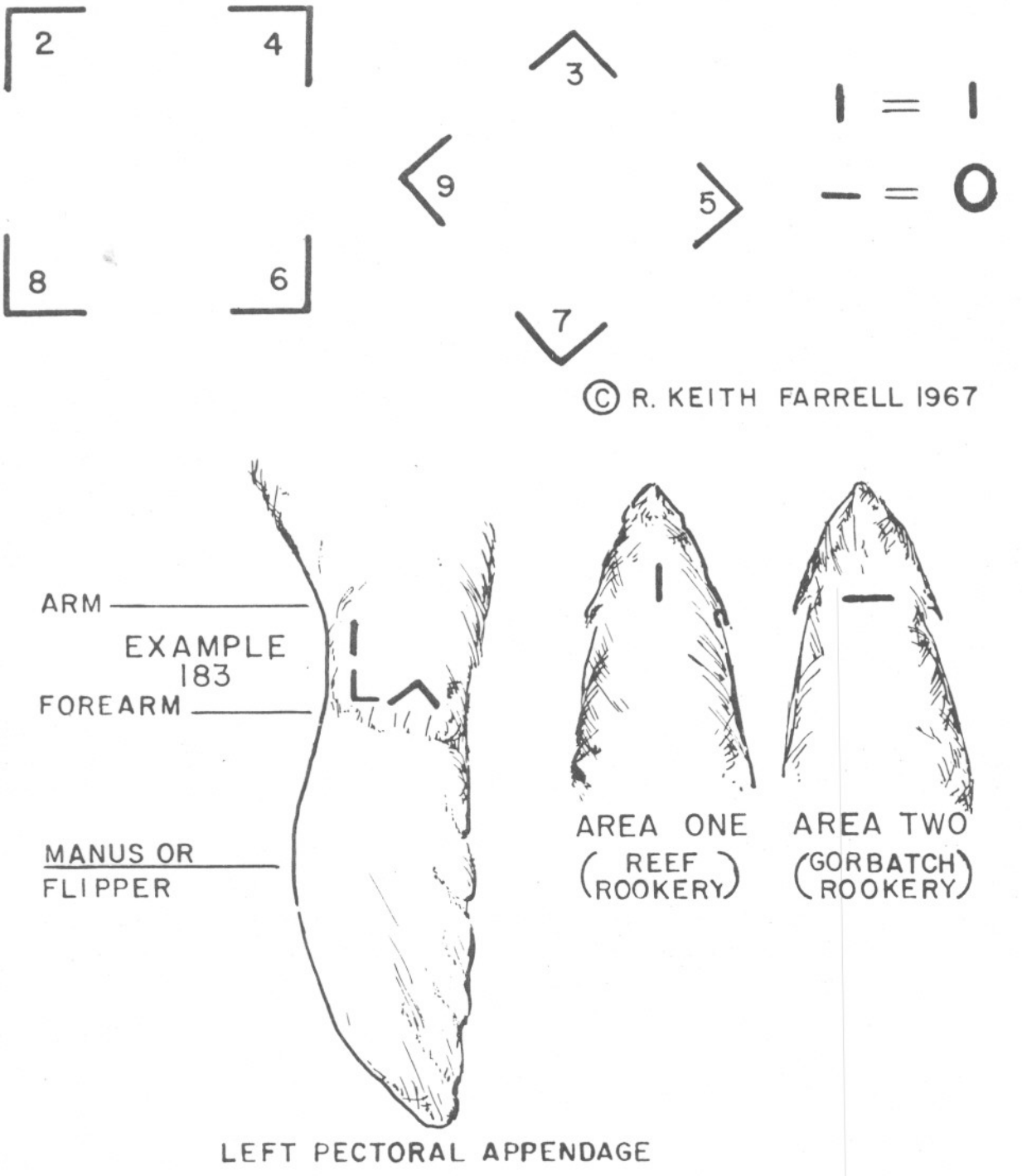
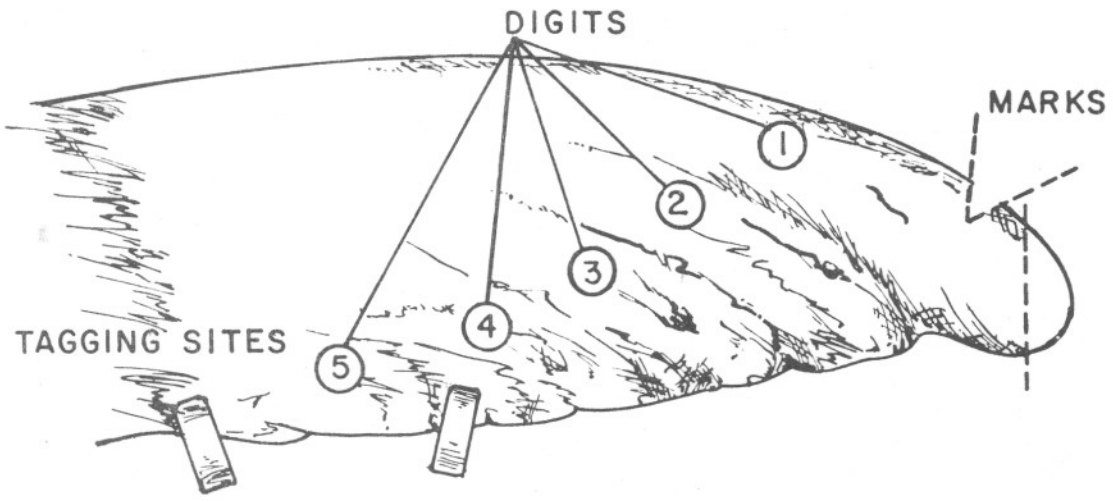
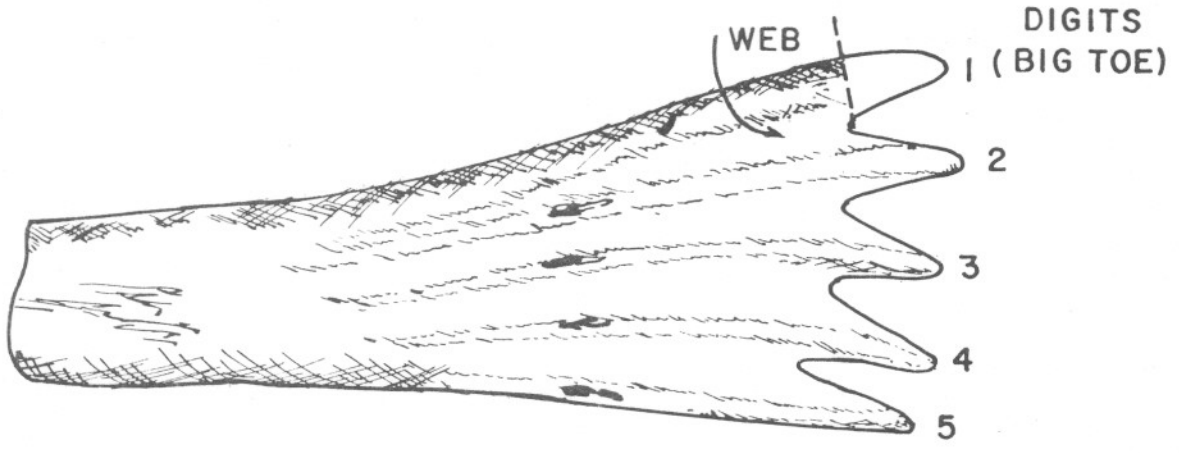


Figure 6.--System of identification symbols used as cryogenic brands applied to pups, Reef and Gorbatch Rookeries, St. Paul Island, Alaska.



FRONT FLIPPER
TAGS CLINCHED AT THE HAIRLINE AND BETWEEN THE FOURTH AND THE FIFTH DIGIT.
MARKS MADE BY CUTTING A V-NOTCH AND REMOVING THE TIP.



HIND FLIPPER
MARK MADE BY REMOVING THE TIP OF THE FIRST DIGIT.

Figure 7. --Examples of mark locations used on fur seals, Pribilof Islands, Alaska.

Table 3.--Summary of tag loss for male seals tagged as pups, tag series T through U, Pribilof Islands, Alaska

Year class and tag series	Age at recovery	St. Paul Island				St. George Island			
		Tagged seals (a)	Lost-tag seals (b)	Total (a)+(b)	Incidence of tag loss (b)/[(a)+(b)]	Tagged seals (a)	Lost-tag seals (b)	Total (a)+(b)	Incidence of tag loss (b)/[(a)+(b)]
	Years	Number				Number			
1967									
T	2	76	19	95	0.20	9	4	13	0.31
T	3	442	216	658	0.33	65	10	75	0.13
T	4	213	150	363	0.41	60	4	64	0.06
T	5	20	28	48	0.58	16	3	19	0.16
Total		751	413	1,164	0.35	150	21	171	0.12
1968									
U	2	31	13	44	0.30	0	1	1	1.00
U	3	169	103	272	0.38	20	11	31	0.35
U	4	184	179	363	0.49	13	22	35	0.63
Total		384	295	679	0.43	33	34	67	0.51

Table 4.--Summary of tag loss for male seals tagged at age 1 or older, Pribilof Islands, Alaska

Tag series	Time elapsed since tagging	Both tags recovered (n_2)	One tag lost (n_1)	Incidence of tag loss (p)[1/]
	Years	Number	Number	
2U	1	332	108	0.14
2U	2	240	146	0.23
2U	3	21	17	0.29
2U	4	2	0	0
Total		595	271	0.19
1U	1	59	12	0.09
1U	2	121	60	0.20
1U	3	20	23	0.36
1U	4	1	1	0.33
Total		201	96	0.19
1V	1	648	384	0.23
1V	2	257	263	0.34
1V	3	45	72	0.44
Total		950	719	0.27
1W	1	519	158	0.13
1W	2	630	254	0.17
Total		1,149	412	0.15
1Y	1	639	355	0.22

1/ $p = \frac{n_1}{2n_2+n_1}$; where n_1 = number recovered with one tag lost; n_2 = number recovered with no tag loss.

POPULATION ESTIMATES

Estimates of the number of pups born and the number of males ages 1, 2, and 3 years are made from mark-recapture data. Sufficient numbers of fur seal pups have been given permanent marks to estimate the number born, nearly every year since 1947. Pups have also been marked temporarily during each of several years by shearing, then sampled 1 to 2 weeks later for a marked-to-unmarked ratio. Since 1961, several hundred males 1, 2, and 3 years old have been marked by double tagging in late September or early October, and recovered in subsequent years to provide estimates of the number of males for these age groups.

Estimates of the number of pups living at the time of marking in 1966 through 1970, based on recoveries in the 1972 harvest, are shown in table 5. Estimates of the size of several recent year classes, based on pooled recoveries at ages 2 through 5, are compared with estimates based on shearing and sampling in table 6. Estimates based on shearing and sampling are consistently lower than those based on the recoveries of other marks.

Estimates of the number of pups on four rookeries at the time of shearing in 1972 are given in table 7. The estimates for three rookeries show moderate increases, slightly over 10% since 1970, however, the estimate for South Rookery was nearly double the estimate for that year.

Recoveries of double-tagged males in the 1972 harvest, when combined with recoveries from previous years, provide estimates of the number of males 1, 2, and 3 years old for year classes 1966 through 1969 (tables 8 and 9). These data were treated as usual before making the estimates; that is, the number of marks applied at each age was calculated from the age distribution observed among recovered animals and corrected for double-tag loss. In addition, the number of double-tagged seals recovered for which age could not be determined, was distributed on the basis of the distribution of animals for which age was determined for the tag series. Additional recoveries from year classes 1968 and 1969 will be made in future harvests.

Ancel M. Johnson

Table 5.--Estimates of the seal pup population, year classes 1966-70, at time of marking from recoveries in 1972 of marked male seals in ages 2 to 6, Pribilof Islands, Alaska

Year class	Age	Killed (C)	Marked (M)	Recovered (R)	Estimate of population at time of marking 1/ ($\hat{N}$) 2/
	Years		Number		
1966	6	74	3/ 12,499	17	52,083
1966	6	74	4/ 12,078	26	33,553
1966	6	74	5/ 24,577	43	41,894
1967	5	2,744	3/ 12,472	67	503,506
1968	4	17,057	3/ 11,675	398	499,171
1969	3	16,466	4/ 25,000	1,108	371,228
1970	2	973	4/ 25,030	35	677,228

1/ Estimates do not include counts of dead pups.

2/ $\hat{N} = \frac{(C+1)(M+1)}{(R+1)}$

3/ Marked by tagging

4/ Seals marked by removing the tip of a hind digit.

5/ All marked seals.

Table 6.--Estimates of the number of seal pups born, [1/] year classes 1961-70, from mark-recapture among males ages 2 through 5 and from shearing and sampling of live pups, Pribilof Islands, Alaska

Year class	Estimate from mark-recaptures ages 2 through 5	Estimate from shearing and sampling of live pups
	Number	Number
1961	544,000	438,000
1962	477,000	362,000
1963	443,000	343,000
1964	421,000	370,000
1965	387,000	347,000
1966	432,000	388,000
1967	446,000	--
1968	[2/]551,000	--
1969	[3/]377,000	304,000
1970	[4/]702,000	306,000

1/ Estimate includes counts of dead pups.

2/ Based on recoveries through age 4.

3/ Based on recoveries through age 3.

4/ Based on recoveries at age 2 only.

Table 7.--Number of pups on four sample rookeries estimated by shearing and sampling, Pribilof Islands, Alaska, 1972

Island and rookery	Number of pups sheared	Counted			Estimated number of pups at time of shearing 2/ $(\hat{N})$
		Sample 1/	Sheared	Total	
St. Paul Island					
Morjovi	2,112	79	256	1,975	16,294
Vostochni	4,746	160	487	4,000	38,982
St. George Island					
Zapadni	1,200	34	129	850	7,907
South	1,242	32	82	800	12,117

1/ Each sample contained 25 pups.

2/ $N = \frac{MC}{R}$; where M = number of pups sheared;
C = total number of pups counted in samples;
R = number of sheared pups counted in samples.

Table 8.--Summary of mark recapture data for year classes 1966-69, Pribilof Islands, Alaska

Year class	Statistics[1/]					
	i	M_i	C_i	R_{0i}	R_{1i}	R_{2i}	R_{3i}
1966	0	24,577	0	-	-	-	-
	1	726	0	-	-	-	-
	2	1,326	2,040	118	63	-	-
	3	86	20,471	1,158	198	405	-
	4	0	13,822	902	101	358	35
	5	0	1,805	136	12	35	11
1967	0	12,472	0	-	-	-	-
	1	489	0	-	-	-	-
	2	2,805	3,051	108	35	-	-
	3	[2/]162	25,092	733	132	963	-
	4	0	15,020	427	41	491	55
	5	0	2,744	67	2	85	22
1968	0	11,675	0	-	-	-	-
	1	269	0	-	-	-	-
	2	[2/]3,134	1,823	45	32	-	-
	3	[2/]701	14,344	303	75	674	-
	4	0	17,057	398	38	779	233
1969	0	25,000	0	-	-	-	-
	1	[2/]396	0	-	-	-	-
	2	[2/]3,011	355	56	10	-	-
	3	0	16,466	1,108	131	809	-

1/ Definition of symbols:
i = age in years
M_i = number effectively marked at age i. For i greater than 0 the number effectively marked has been corrected for double-tag loss.
C_i = number of males harvested at age i.
R_{0i}, R_{1i}, R_{2i}, R_{3i} = number of males marked at age 0, 1, 2, 3, respectively, recovered at age i.

2/ The effective number marked for tag series 1W and 1Y, series for which recoveries are not completed, have been corrected by appropriate factors observed for recoveries of tag series 1V.

Table 9 .--Number of male fur seals ages 0 to 3 years estimated from mark-recapture data, year classes[1/] 1966-69, Pribilof Islands, Alaska

Age	Year class			
	1966	1967	1968	1969
0[2/]	216,000	223,000	275,000	188,000
	194,000	--	--	152,000
1[3/]	74,033	106,898	61,636	47,242
2[3/]	59,982	78,110	67,729	61,284
3[3/]	29,216	37,374	51,317	

1/ All estimates not available for some year classes.

2/ Estimated number at time of marking from table 6 divided by 2, first value from mark-recapture estimate and second estimate from shearing and sampling.

3/ $\hat{N}_i = \frac{M_i C_i^*}{r_i^*}$; where $\hat{N}_i$ = estimated number of males at age i;
M_i = number of males effectively marked at age i;
C_i^* = total kill of males from year class after age i;
r_i^* = total number of recaptures of M_i.

ACKNOWLEDGMENTS

The research in 1972 was completed with the cooperation of William L. Peck, Program Director; Bertel W. Johnson, Management Staff Officer; and Harold A. Thayer, Program Construction Supervisor. Others who cooperated on St. Paul Island were Victor Misikin, Village Foreman; Alexander Melovidov, Sealer Foreman; and Lee Paola, Superintendent, Oregon-Alaska Marine Products. On St. George Island, the fur seal investigations were completed with the cooperation of Nicolai S. Merculief, Village Foreman, and Innokenty C. Lestenkof, Sealer Foreman.

GLOSSARY

The following terms used in fur seal research and management on the Pribilof Islands have special meanings or are not readily found in standard dictionaries.

Checkmark A notch, slit, hole, or other mark made on a seal flipper when a tag is applied, to ensure later recognition of an animal that has lost its tag. See mark and lost tag.

Drive The act of surrounding and moving groups of seals on land from one location to another.

Escapement Seals that were not killed because they were too old, too large, or were not available.

Flipper mark See mark.

Hauling Ground An area, usually near a rookery, on which nonbreeding seals congregate. See rookery.

Haul Out The act of seals moving from the sea to a rookery or hauling ground on shore.

Known-age Refers to a seal whose age is known because the animal bears an inscribed tag or has a certain combination of tag-scar and checkmark.

Lost-tag Refers to a seal known to have been tagged as a pup because it bears a checkmark.

Male Seals, Adult Class 1 Shoreline - Full-grown males about age 10 and older without females but apparently with established territories at the high-tide mark.

Class 2 Territorial without females - Full-grown males about age 10 and older without females but with established territories on the rookery.

Class 3 Territorial with females - Full-grown males about age 10 and older with females and established territories on the rookery.

Class 4 Back fringe - Full-grown and partly grown males about age 7 and older without females and territories that are along the inland fringe of the rookery.

Class 5 Hauling ground - Full-grown and partly grown males about age 7 and older without females that are on traditional hauling grounds.

Mark Examples of marks are the tip of a digit from a hind flipper removed, a V-notch cut into the leading edge of a front flipper near the tip, or the tip of a front flipper sliced off.

Rookery An area on which breeding seals congregate.

Round The sequence in which hauling grounds on St. Paul Island are visited to harvest seals. When used, a circuit or round of the hauling grounds is completed in 5 days and the procedure is repeated throughout the kill of males. The mean round of the kill is calculated by multiplying the round number by the number killed in that round and dividing the cumulative product by the cumulative kill.

Tagged Describes a seal having an inscribed metal tag or tags attached to one or more of its flippers.

Tag Recoveries Includes tags recovered, marked seals recovered, and seals identified from checkmarks as having lost their tags. See checkmark, marked, and lost tag.

Part I-A. FUR SEAL INVESTIGATIONS, SAN MIGUEL ISLAND, 1972

The populations of northern fur seals associated with San Miguel Island breed in two locations. One rookery is on the shore of San Miguel Island at Adams Cove and another on Castle Rock. Castle Rock is a small, rocky island located about 2 miles north of the west end of San Miguel Island. As used in this report, San Miguel Island includes both populations. The names Adams Cove and Castle Rock, when used, refer to the populations associated with each of these locations.

Adams Cove

An observational study of the small breeding colony of northern fur seals on San Miguel Island begun in 1969 was continued in 1972. Some of the more important observations of the population in Adams Cove are shown in table 10. The most interesting observation in 1971 was an increase in the number of females in late August and September at Adams Cove; the highest count was 274. In 1972, a corresponding increase in the number of pups born in Adams Cove occurred. Many of the late-arriving females observed in 1971 were young animals with dark whiskers (most or all females age 4 or younger have dark whiskers). Six of these seals, ages 3 to 17 years, had been tagged as pups on the Pribilof Islands.

Castle Rock

An additional breeding colony of northern fur seals was discovered in July of 1972 on Castle Rock. Castle Rock consists of a series of three narrow rocks rising abruptly to 180 feet and a low reef that is partially awash at high tide. The entire area is about 100 meters wide and 500 meters long. Castle Rock and San Miguel Island are separated by a shoal area that is dangerous to boat travel, even under the best sea conditions. Following a first attempt in July, a successful landing was made in September. Aerial photographs were taken 1 August, and counts of animals are presented in table 11. The large increase in females noted at Adams Cove in late 1971 may have come from the population on Castle Rock.

Table 10.--Summary of some observations of the northern fur seal colony at Adams Cove, San Miguel Island, California, 1969-72

Observation:	1969	1970	1971	1972
First male	16 May	29 May	24 May	16 May
First female	27 May	28 May	25 May	22 May
First birth	6 June	28 May	31 May	22 May
Mean birth date	24 June	21 June	26 June	22 June
Total births	28	33	45	70
Total pup deaths	2	14	15	21
Total males[1/]	12	11	16	23
Total females (maximum counted and date)[2/]	175 23 Aug.	179 23 Aug.	274 2 Sept.	310 16 Aug.

1/ Includes four each of large adult, small adult, and bachelor-size (about 104-127 cm in body length, tip of nose to tip of tail) males in 1969. In 1970, includes two large adult, four small adult, and five bachelor-size males. In 1971, includes four large adult, six small adult, and six bachelor-size males. In 1972, includes six large adult, seven small adult, and 10 bachelor-size males.

2/ A few 2-, 3-, and 4-year-old males may have been included because they are about the same size as adult females.

Table 11.--Counts of northern fur seals on Castle Rock, San Miguel Island, California, 1972[1/]

Date	Weather	Type of census	Male		Female[2/]	Pups
			Adult	Subadult (bachelors)		
17 July (1015 hours)	Hot, calm	From skiff	8	-	[3/]100+	[4/]44
18 July (0900 hours)	Hot, calm	From skiff	8	-	[3/]100+	[5/]43
1 Aug.	Cool, stormy	Aerial photos[6/]	10	-	223	95
8 Sept. (1600 hours)	Hot, calm	Land	8	4	166	53

1/ This breeding colony was discovered 17 July 1972.

2/ May include a few young males.

3/ Many females were in water due to high air temperature.

4/ Many pups were not visible due to rough physiography.

5/ Many pups observed in water and among kelp beds around Castle Rock.

6/ Counts made from aerial photographs.

The most complete information for the total fur seal population on San Miguel Island and Castle Rock was collected 1 August 1972. Combining the counts at Adams Cove and from aerial photographs gives minimum values by major segments of the population. Thus, minimum counts of 10 adult males, 466 adult females (which may include a few young males), and 139 pups were obtained. Additional counts show that at least 165 pups were born--that is, 95 on Castle Rock and 70 at Adams Cove.

Of 25 fur seals tagged elsewhere as pups and observed on San Miguel Island since 1968, 21 were from the Pribilof Islands (1-J, 1-M, 8-N, 2-O, 1-Q, 2-R, 5-T, and 1-U), 3 from the Commander Islands (BB1364, E 2818, T 19022) and 1 from Robben Island (Y 7104, with other tag missing).

Part II. PELAGIC FUR SEAL INVESTIGATIONS, 1972

Ocean research on fur seals is carried out each year by the Marine Mammal Division, Northwest Fisheries Center, NMFS, under the terms of the Interim Convention on Conservation of North Pacific Fur Seals (1957) and its amending Protocol (1963). Information was gathered on the pelagic life of the fur seal in 1972 as requested by the North Pacific Fur Seal Commission to provide information useful to the United States for managing the fur seal population that returns each year to the Pribilof Islands.

RESEARCH IN 1972

Ocean research was carried out off the coast of Washington between latitudes 46° and 49° N and from the coast west to about longitude 131° W, from 7 March to 25 May 1972 (research cruise 35) from the chartered vessel M/V Tonquin. 2/

Equipment and methods have been described in earlier reports (Fiscus, Baines, and Wilke, 1964; Fiscus and Kajimura, 1967). Use of the beam scale for weighing fetuses, which was first used in 1971, was continued this season. Field season participants are listed in Appendix C.

A number of special collections were made in addition to materials regularly taken (table B-19).

Distribution and Abundance

In 1972, 849 seals were sighted and 257 were collected. A total of 76 seals were collected during 14 days (12.50 BHD) 3/ in March, 65 during 15 days (14.00 BHD) in April, and 116 during 18 days (17.25 BHD) in May. The most seals seen on a single day were 169 on 27 March over the continental shelf off Grays Harbor, Wash. Sixty seals were collected 6-7 May in the general vicinity of the Cobb Seamount (279 miles off Cape Shoalwater, Wash.).

2/ Registered length 29.4 m (96.6 ft), 200 tons net, 350 horsepower, cruising speed 16.7 km per hour (9 knots).

3/ BHD = a boat-hunting day is a day in which a vessel is used for 8 hours or more; units of a boat-hunting day are: 0.25, 0.50, 0.75, and 1.00.

The distribution of fur seals seen and collected is shown in figures 8 to 10, as seals seen per hour of effort and in tables B-1 to B-3 by chart unit, time in unit, seals seen per hour, and the actual numbers of seals seen and collected in each unit.

Although we were ready to begin operations on 1 March, storms off the coast prevented getting out to sea until 7 March. Vessel time at sea and numbers of seals seen and collected by 10-day periods are given in tables B-4 and B-5. Tables B-6 and B-7 show the numbers of seals seen, shot, collected and lost since 1958. The number of seals seen per group is given in table B-8.

During March, April, and May, surface water temperatures taken when each seal was collected ranged from 8° to 11° C. Fifty-two percent of the seals taken were associated with water of 9° C, and 20% each were found in 8° and 10° C water.

The first (0600 to 0700) and last (1700 to 1800) hours of hunting were the least productive. Thirty-four percent of the seals were collected between 1100 and 1400 hours.

Age and Sex

The age and sex of seals collected are given in table 12. Twenty-five males ages 1 to 6 and 232 females ages 1 to 19 were taken.

Recoveries of Marked Seals

Table 13 lists the tagged or marked seals collected. No Soviet tagged seals were taken in 1972.

Lengths and Weights

Mean lengths and weights of pregnant and nonpregnant females are given in tables B-9 to B-12, and for males in tables B-13 and B-14. Mean lengths and weights of male and female fetuses, by 10-day periods, are shown in table B-15.

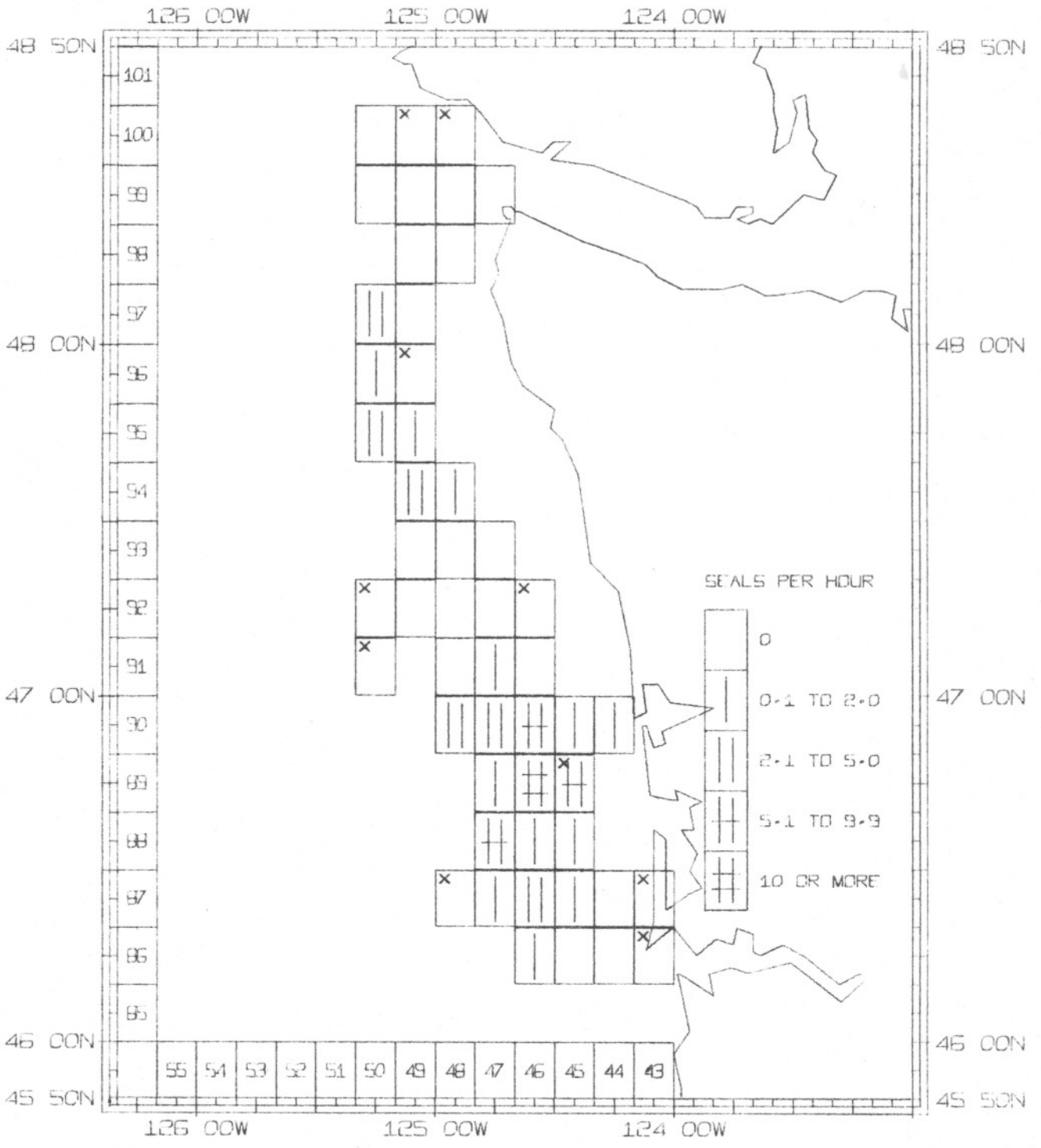


Figure 8.--Number of seals seen per hour of effort in each areal unit occupied by a research vessel in March 1972, off Washington. The sides of each unit measure 10 minutes of latitude by 10 minutes of longitude. Units occupied for less than 0.5 hour are marked "X." See table B-1 for data.

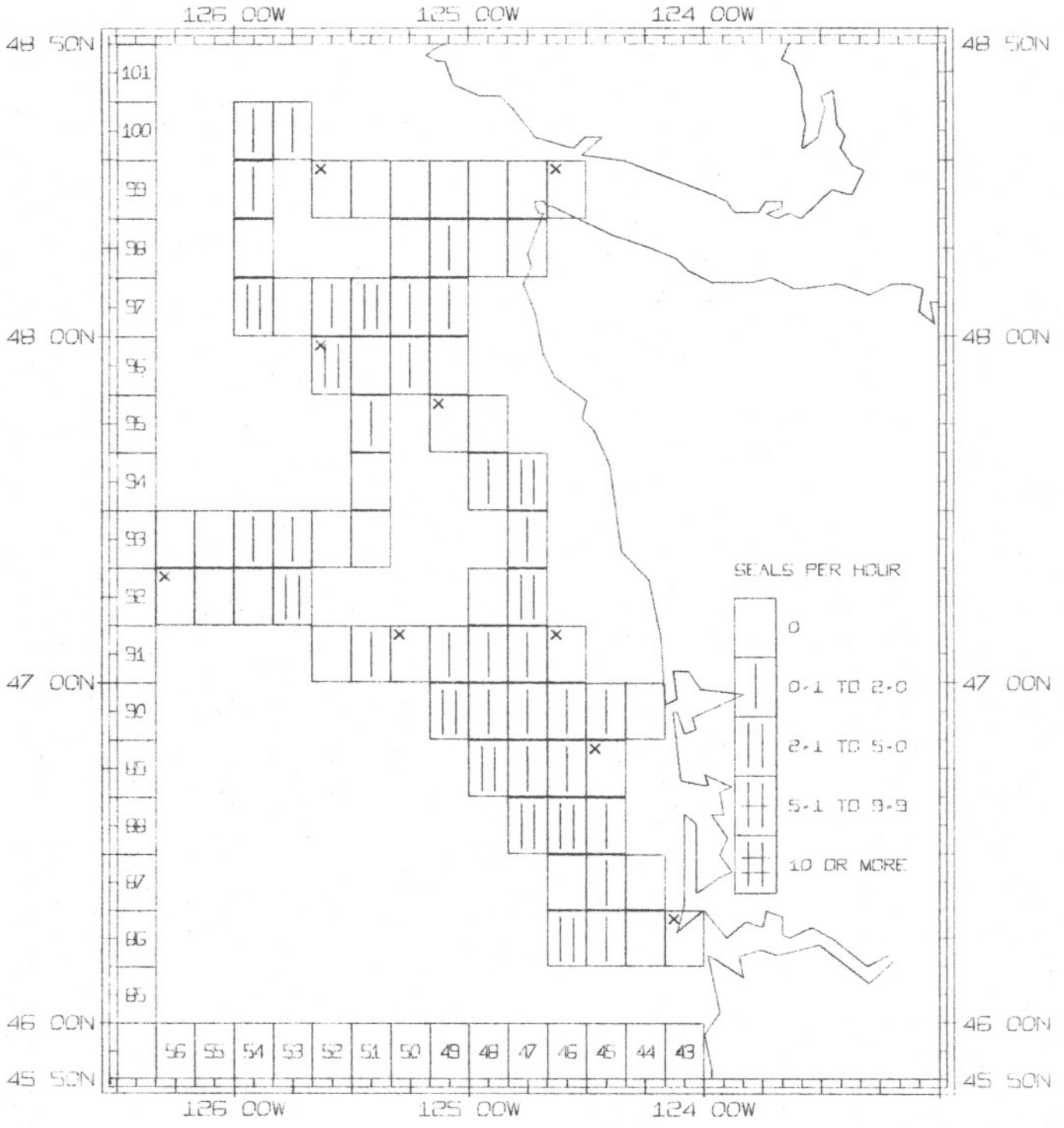


Figure 9. -- Number of seals seen per hour of effort in each areal unit occupied by a research vessel in April 1972, off Washington. The sides of each unit measure 10 minutes of latitude by 10 minutes of longitude. Units occupied for less than 0.5 hour are marked "X." See table B-2 for data.

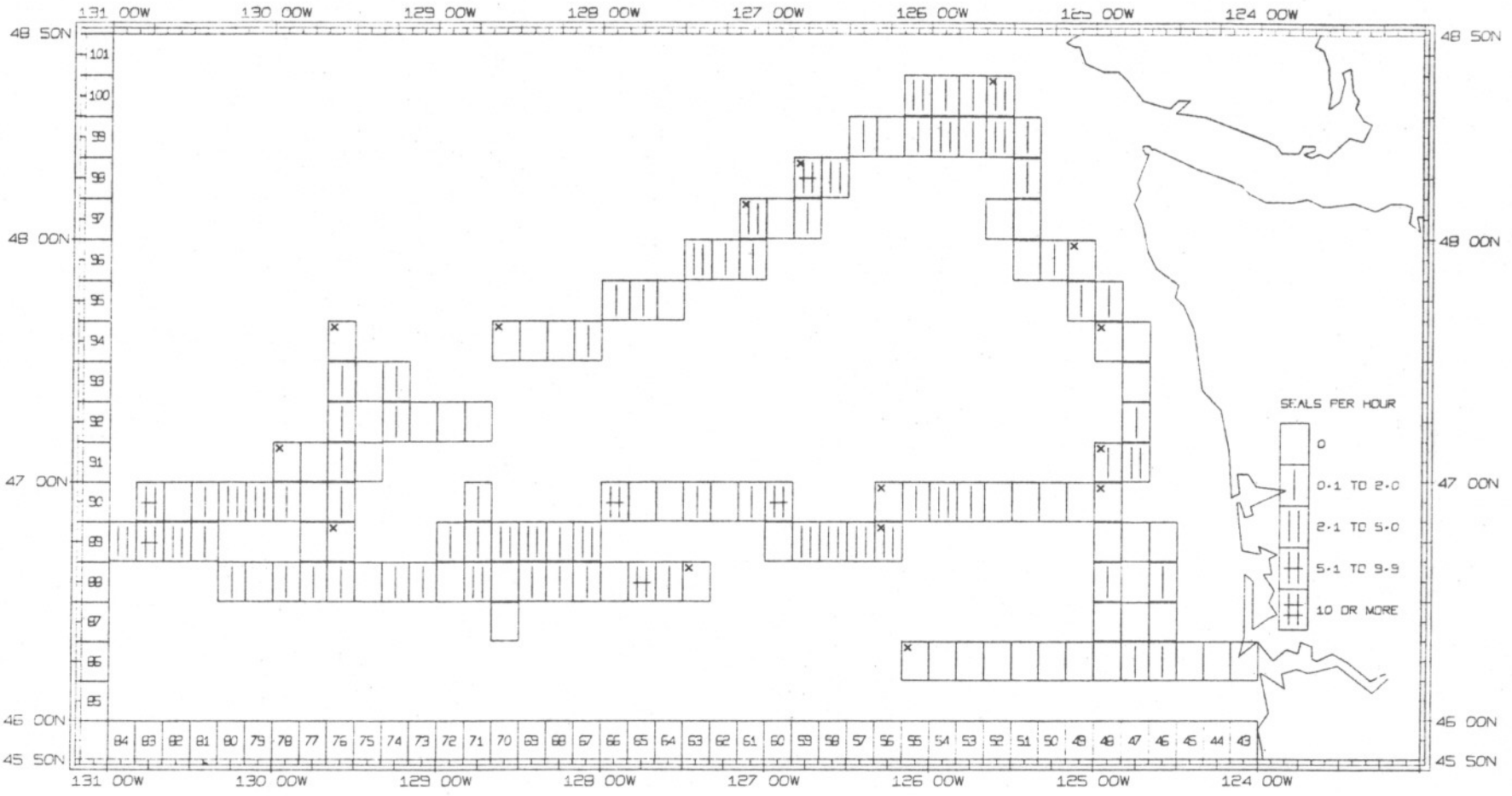


Figure 10. --Number of seals seen per hour of effort in each areal unit occupied by a research vessel in May 1972 off Washington. The sides of each unit measure 10 minutes of latitude by 10 minutes of longitude. Units occupied for less than 0.5 hour are marked "X." See table B-3 for data.

Table 12.--Age and sex, by month, of fur seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March				April				May				Total			
	Male		Female		Male		Female		Male		Female		Male		Female	
Years	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	2	40.0	5	7.0	-	-	1	1.7	1	6.7	2	2.0	3	12.0	8	3.4
2	1	20.0	-	-	1	20.0	2	3.3	4	26.7	9	8.9	6	24.0	11	4.7
3	-	-	4	5.6	2	40.0	3	5.0	7	46.7	8	7.9	9	36.0	15	6.5
4	2	40.0	4	5.6	1	20.0	7	11.7	2	13.3	6	5.9	5	20.0	17	7.3
5	-	-	10	14.1	1	20.0	8	13.3	-	-	18	17.8	1	4.0	36	15.5
6	-	-	7	9.9	-	-	6	10.0	1	6.7	13	12.9	1	4.0	26	11.2
7	-	-	5	7.0	-	-	4	6.7	-	-	11	10.9	-	-	20	8.6
8	-	-	7	9.9	-	-	7	11.7	-	-	6	5.9	-	-	20	8.6
9	-	-	4	5.6	-	-	5	8.3	-	-	4	4.0	-	-	13	5.6
10	-	-	7	9.9	-	-	5	8.3	-	-	5	5.0	-	-	17	7.3
11	-	-	7	9.9	-	-	2	3.3	-	-	6	5.9	-	-	15	6.5
12	-	-	3	4.2	-	-	1	1.7	-	-	4	4.0	-	-	8	3.4
13	-	-	4	5.6	-	-	3	5.0	-	-	1	1.0	-	-	8	3.4
14	-	-	3	4.2	-	-	1	1.7	-	-	1	1.0	-	-	5	2.2
15	-	-	1	1.4	-	-	2	3.3	-	-	3	3.0	-	-	6	2.6
16	-	-	-	-	-	-	1	1.7	-	-	2	2.0	-	-	3	1.3
17	-	-	-	-	-	-	1	1.7	-	-	1	1.0	-	-	2	0.9
18	-	-	-	-	-	-	1	1.7	-	-	-	-	-	-	1	0.4
19	-	-	-	-	-	-	-	-	-	-	1	1.0	-	-	1	0.4
Total	5		71		5		60		15		101		25		232	

Table 13.--Tag recoveries from fur seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

[Figures in parentheses indicate number of animals that had lost tags; they are included in the totals]

Age	Year of tagging	Tag series	Seals tagged or marked	Tag recovery ♂	Tag recovery ♀	Seals collected in each age group[1/] ♂	Seals collected in each age group[1/] ♀
Years			Number	Number		---Number----	
1	1971	Marked[2/]	24,995	-	1	3	8
3	1969	Marked[2/]	25,000	-	1	9	15
	1971	1Y[3/]	3,992	1	-	-	-
5	1967	T	12,472	-	1(1)	1	36
6	1966	S	24,580	-	[4/]2	1	26
8	1964	Q	24,991	-	1(1)	-	20
10	1962	O	49,908	-	[5/]3	-	17
13	1959	L	49,881	-	1	-	8
14	1958	K	54,917	-	1	-	5
15	1957	J	49,842	-	1(1)	-	6

1/ Table does not include seals born in years when seals were not tagged or marked, nor year classes from which no tagged or marked seals were taken.

2/ See table A-14, Seal pups tagged and marked, Pribilof Islands, Alaska, 1963-72.

3/ See table A-15, Record of tags applied to male seals selected as yearlings and as 2-year-olds on the basis of body length or size, St. Paul Island, 1961-63 and 1965-71.

4/ Includes one marked only seal.

5/ Includes one female tagged by R. Peterson (62-242).

Reproduction

Table B-16 gives the reproductive condition, by month, of female seals taken and table B-17 shows these same data in the standardized format requested by the Fur Seal Commission at its 15th annual meeting in Moscow in March 1972.

The pregnancy rates of female seals age 3 and older taken in 1972 are shown in table B-18 and those for all female seals age 3 and older taken pelagically by the United States in the eastern North Pacific Ocean since 1958 are given in table 14.

Feeding Habits

Of the 257 seals collected in 1972, the stomachs of 162 (63%) contained food and the remainder were empty. Five food species (Fig. 11) contributed 91% of the total food volume. Squids (representing 9 species) were the leading food item, contributing 34% of the total volume. Following in order were northern anchovy, Engraulis mordax (26%); Pacific herring, Clupea harengus pallasi (17%); rockfish, Sebastes spp. (8%); and American shad, Alosa sapidissima (6%).

The locations where principal food species were found, as indicated by the collection of fur seals from which the stomachs were taken, are shown in figures 12 to 18. The total stomach contents are given by species in table 15.

Relation of Food of Fur Seals to Commercial Fisheries

Salmonidae, probably salmon, Oncorhynchus spp. (15 occurrences; 3.7%) were the most valuable commercial fish eaten by fur seals collected off Washington in 1972. One sockeye, O. nerka, [4/] and one pink salmon, O. gorbuscha, [4/] were identified from scales taken from one of the stomachs.

Clifford H. Fiscus, Hiroshi Kajimura,
and Allen A. Wolman

4/ Salmon scales were identified by Kenneth H. Mosher, Northwest Fisheries Center, National Marine Fisheries Service, Seattle, Wash.

Table 14 --Number of female seals collected pelagically by the United States in the eastern Pacific Ocean and (in parentheses) percentage pregnant, 1958-72

Age	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1958-72 combined
Years									Number							
3	39	43	18	84	93	53	74	51	30	10	35	19	62	39	15	665
	(2.6)	(0.0)	(0.0)	(0.0)	(1.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.3)
4	42	93	36	96	140	113	62	73	68	9	95	32	66	56	17	998
	(2.4)	(6.4)	(2.8)	(1.0)	(2.9)	(7.1)	(1.6)	(0.0)	(1.5)	(0.0)	(5.3)	(3.1)	(0.0)	(0.0)	(0.0)	(2.9)
5	70	114	55	68	123	162	84	23	66	9	37	23	37	24	36	931
	(45.7)	(56.1)	(49.1)	(20.6)	(26.0)	(43.8)	(35.7)	(26.1)	(27.3)	(44.4)	(37.8)	(34.8)	(35.1)	(25.0)	(13.9)	(37.0)
6	99	118	45	62	72	90	81	37	35	20	47	23	41	26	26	822
	(80.8)	(77.1)	(80.0)	(75.8)	(54.2)	(74.4)	(75.3)	(56.8)	(71.4)	(60.0)	(76.6)	(56.5)	(63.4)	(69.2)	(50.0)	(71.2)
7	103	143	66	95	93	77	44	24	46	7	69	27	19	23	20	856
	(89.3)	(76.2)	(78.8)	(75.8)	(84.9)	(88.3)	(77.3)	(79.2)	(78.3)	(71.4)	(72.5)	(63.0)	(84.2)	(87.0)	(55.0)	(79.4)
8	102	164	105	107	98	87	46	33	43	7	38	22	23	15	20	910
	(89.2)	(86.6)	(85.7)	(79.4)	(89.8)	(97.7)	(84.8)	(84.8)	(79.1)	(85.7)	(78.9)	(72.7)	(82.6)	(80.0)	(80.0)	(85.7)
9	81	108	144	114	73	60	30	17	20	12	40	5	22	11	13	750
	(96.3)	(88.9)	(92.4)	(93.9)	(83.6)	(85.0)	(83.3)	(70.6)	(100.0)	(100.0)	(82.5)	(100.0)	(77.3)	(54.5)	(61.5)	(88.7)
10	97	96	129	112	100	72	49	10	13	11	40	21	13	18	17	798
	(87.6)	(85.4)	(91.5)	(93.8)	(89.0)	(93.1)	(87.8)	(90.0)	(84.6)	(90.9)	(77.5)	(81.0)	(61.5)	(77.8)	(82.4)	(88.1)
11	113	98	136	82	91	88	42	18	23	4	39	26	14	10	15	799
	(92.0)	(89.8)	(91.2)	(89.0)	(89.0)	(94.3)	(85.7)	(83.3)	(78.3)	(100.0)	(76.9)	(73.1)	(78.6)	(80.0)	(93.3)	(88.6)
12	134	76	106	71	97	92	51	15	16	3	40	24	13	16	8	762
	(82.0)	(88.2)	(90.6)	(93.0)	(89.7)	(92.4)	(84.3)	(73.3)	(100.0)	(66.7)	(90.0)	(83.3)	(69.2)	(81.2)	(87.5)	(87.7)
13	110	56	120	76	58	76	33	8	12	3	24	11	14	8	8	617
	(82.7)	(89.3)	(87.5)	(82.9)	(94.8)	(90.8)	(84.8)	(100.0)	(100.0)	(100.0)	(83.3)	(36.4)	(64.3)	(100.0)	(100.0)	(86.4)
14	92	70	107	67	65	57	38	10	14	1	26	7	1	3	5	563
	(81.5)	(84.3)	(80.4)	(92.5)	(87.7)	(80.7)	(76.3)	(80.0)	(85.7)	(100.0)	(80.8)	(71.4)	(100.0)	(66.7)	(80.0)	(83.1)
15	71	87	67	68	53	75	41	14	15	3	30	4	5	4	6	543
	(78.9)	(88.5)	(83.6)	(79.4)	(81.1)	(85.3)	(65.9)	(78.6)	(93.3)	(66.7)	(86.7)	(100.0)	(100.0)	(50.0)	(66.7)	(82.0)
16	56	69	53	55	50	45	22	12	5	6	26	5	3	3	3	413
	(78.6)	(75.4)	(71.7)	(85.5)	(82.0)	(82.2)	(72.7)	(83.3)	(80.0)	(100.0)	(96.2)	(60.0)	(100.0)	(66.7)	(66.7)	(79.9)
17	36	36	46	24	44	28	21	10	5	2	21	7	-	2	2	284
	(56.6)	(80.6)	(67.4)	(62.5)	(72.7)	(71.4)	(61.9)	(80.0)	(40.0)	(0.0)	(81.0)	(57.1)	-	(0.0)	(50.0)	(67.6)
18	22	27	23	25	25	12	20	8	-	-	11	4	6	3	1	187
	(59.1)	(85.2)	(82.6)	(64.0)	(72.0)	(58.3)	(60.0)	(37.5)	-	-	(72.7)	(75.0)	(16.7)	(100.0)	(100.0)	(67.9)
19	14	16	19	10	15	5	7	2	3	-	10	2	2	-	1	106
	(28.6)	(81.3)	(57.9)	(50.0)	(60.0)	(60.0)	(57.1)	(0.0)	(33.3)	-	(60.0)	(50.0)	(0.0)	-	(0.0)	(53.8)
20	3	5	6	7	11	11	10	2	1	1	7	-	-	1	-	65
	(33.3)	(40.0)	(16.7)	(100.0)	(72.7)	(45.5)	(20.0)	(0.0)	(0.0)	(0.0)	(71.4)	-	-	(100.0)	-	(49.2)
21	1	7	6	2	3	4	-	1	1	-	3	-	1	-	-	29
	(100.0)	(85.7)	(50.0)	(50.0)	(100.0)	(50.0)	-	(0.0)	(0.0)	-	(33.3)	-	(0.0)	-	-	(58.6)
22	1	5	-	-	3	-	-	-	-	1	3	-	-	1	-	14
	(0.0)	(40.0)	-	-	(66.7)	-	-	-	-	(0.0)	(0.0)	-	-	(100.0)	-	(35.7)
23	-	1	1	1	-	2	1	1	-	-	1	-	-	-	-	8
	-	(0.0)	(0.0)	(0.0)	-	(0.0)	(100.0)	(0.0)	-	-	(0.0)	-	-	-	-	(12.5)
24	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	4
	-	(0.0)	(0.0)	(0.0)	(0.0)	-	-	-	-	-	-	-	-	-	-	(0.0)
26	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	-	(0.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	(0.0)
Total	1,286	1,434	1,289	1,227	1,308	1,209	756	369	416	109	642	262	342	263	213	11,125
	(76.1)	(73.8)	(79.7)	(68.5)	(63.4)	(69.3)	(58.7)	(45.8)	(52.3)	(61.5)	(61.4)	(53.4)	(40.4)	(44.1)	(50.7)	(66.3)
6-26 years	1,135	1,184	1,180	979	952	881	536	222	252	81	475	188	177	144	145	8,531
	(83.3)	(83.4)	(84.4)	(84.3)	(83.2)	(86.0)	(77.0)	(73.4)	(81.3)	(77.8)	(78.9)	(69.7)	(70.6)	(76.4)	(71.0)	(82.0)

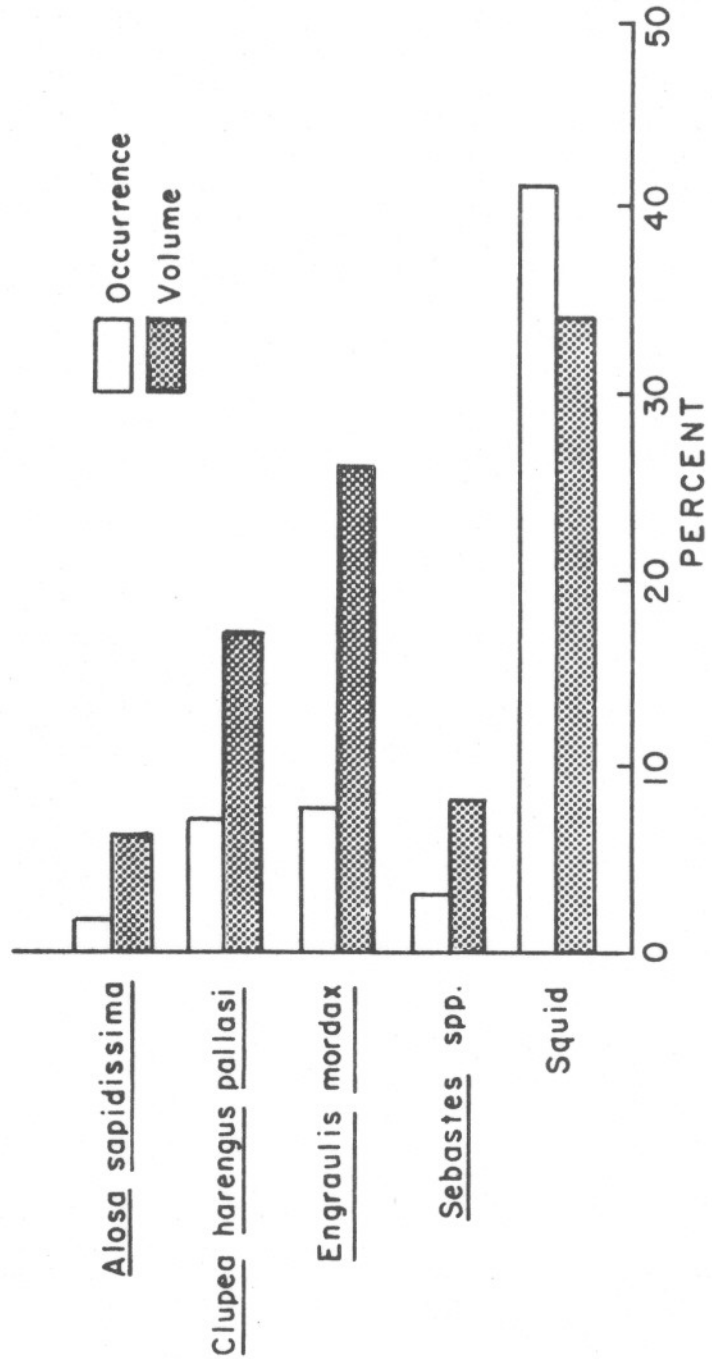


Figure 11. --Percentage of stomach content volume and percentage occurrence of principal food species in fur seal stomachs collected off Washington in 1972.

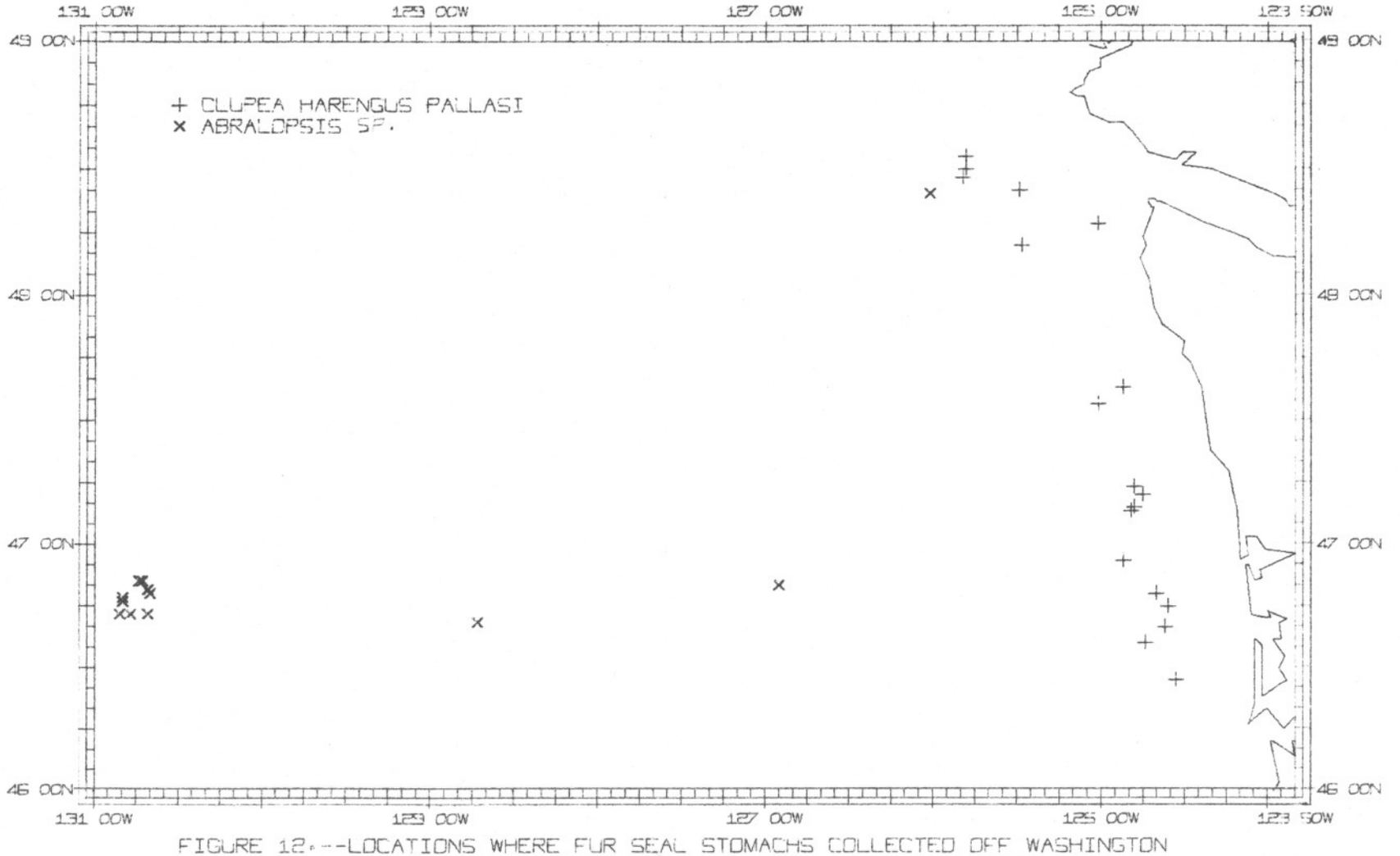


FIGURE 12.--LOCATIONS WHERE FUR SEAL STOMACHS COLLECTED OFF WASHINGTON IN 1972 CONTAINED CLUPEA HARENGUS PALLASI (18 OCCURRENCES) AND ABRALIOPSIS SP. (16 OCCURENCES).

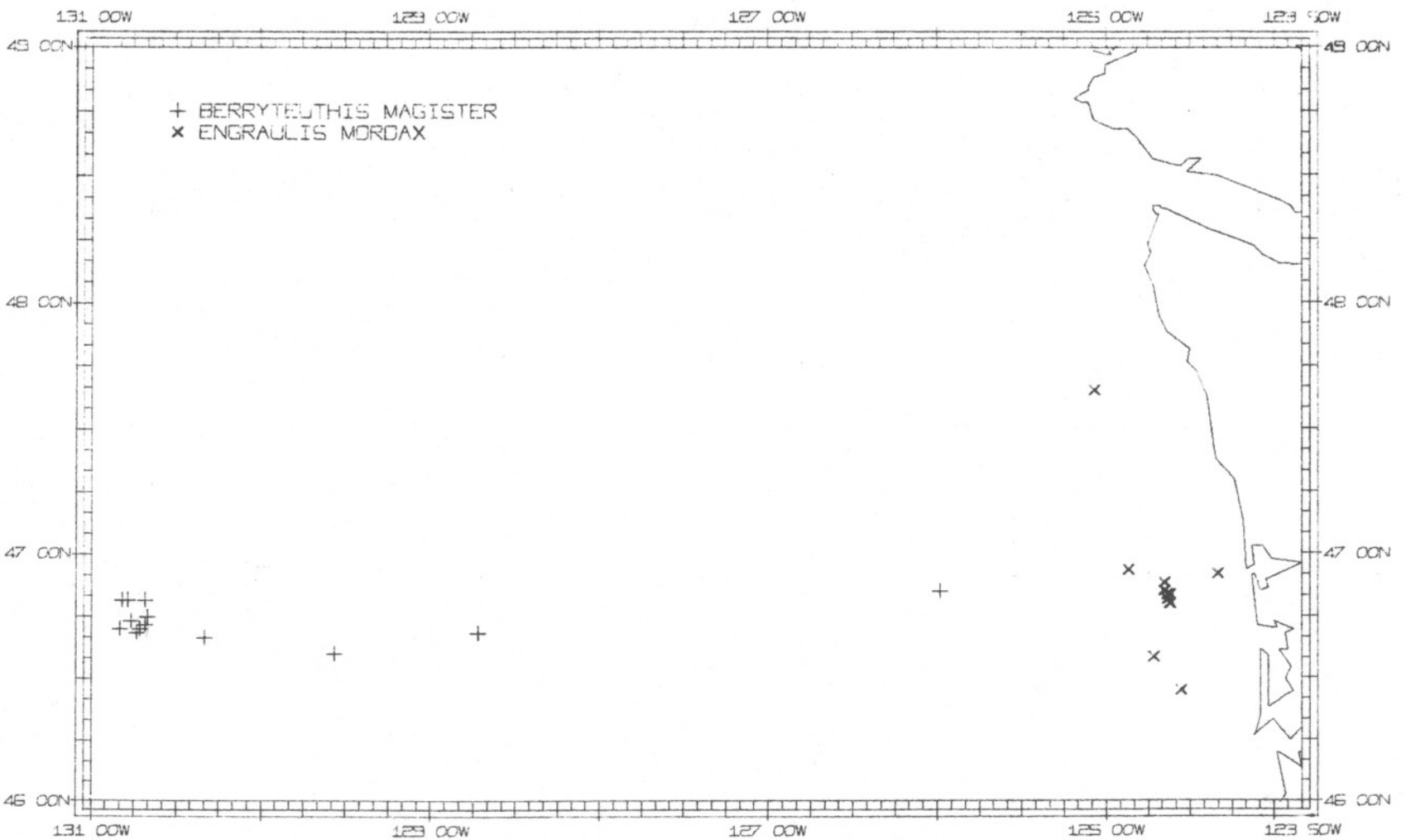


FIGURE 13.--LOCATIONS WHERE FUR SEAL STOMACHS COLLECTED OFF WASHINGTON IN 1972 CONTAINED BERRYTEUTHIS MAGISTER (14 OCCURRENCES) AND ENGRAULIS MORDAX (20 OCCURRENCES).

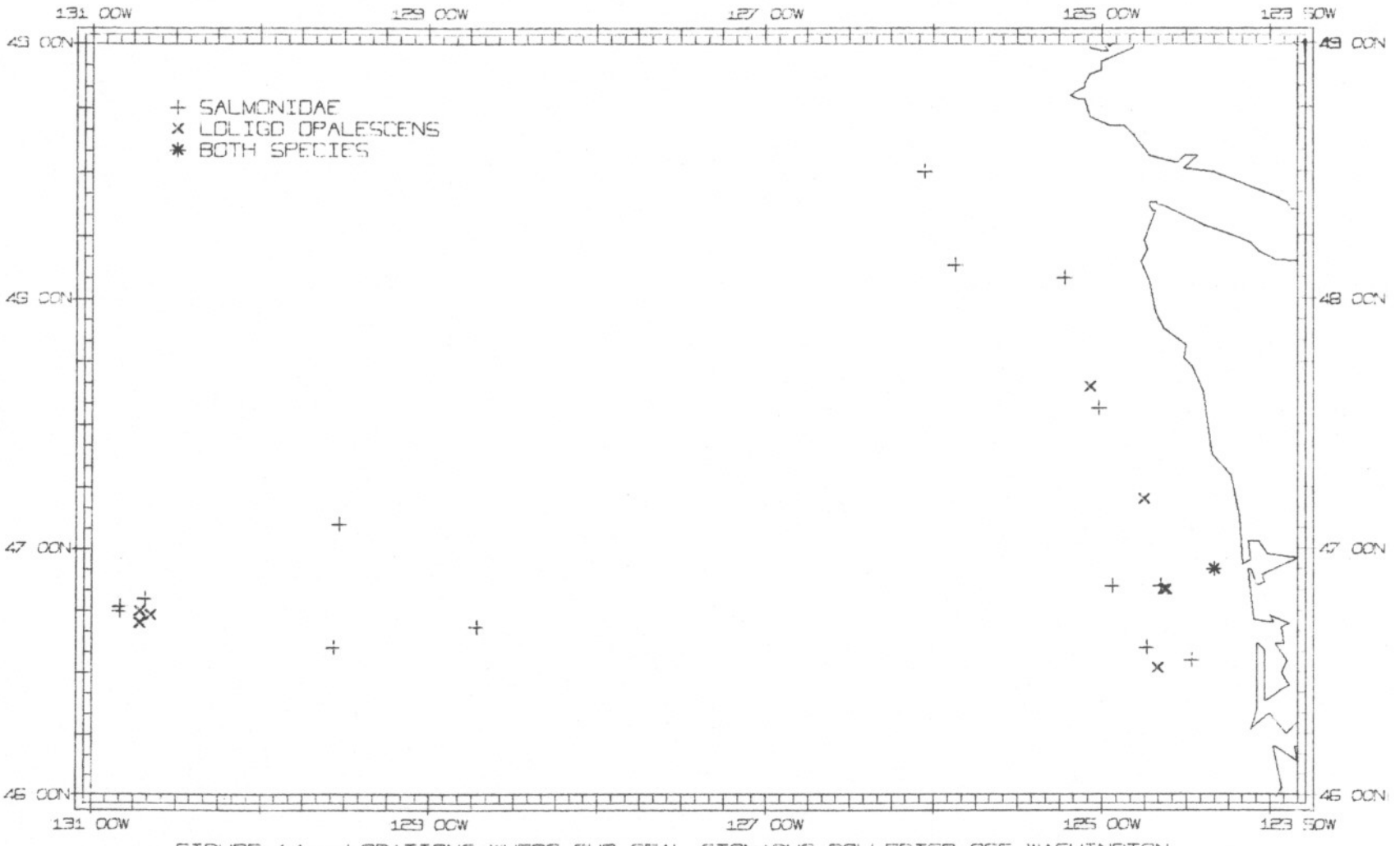


FIGURE 14.--LOCATIONS WHERE FUR SEAL STOMACHS COLLECTED OFF WASHINGTON IN 1972 CONTAINED SALMONIDAE (15 OCCURRENCES) AND LOLIGO OPALESCENS (11 OCCURRENCES).

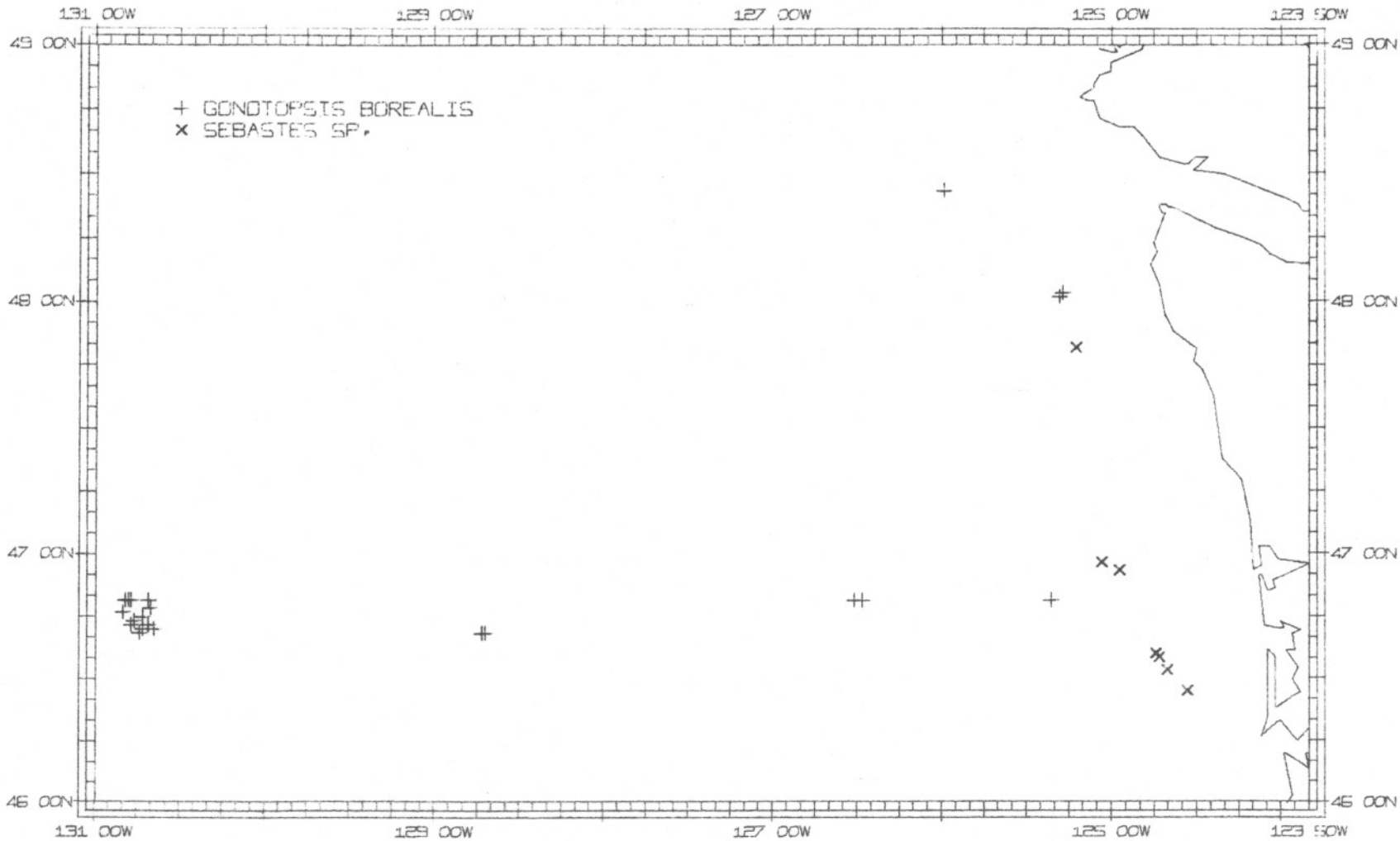


FIGURE 15.--LOCATIONS WHERE FUR SEAL STOMACHS COLLECTED OFF WASHINGTON IN 1972 CONTAINED GONATOPSIS BOREALIS (24 OCCURRENCES) AND SEBASTES SP. (8 OCCURRENCES).

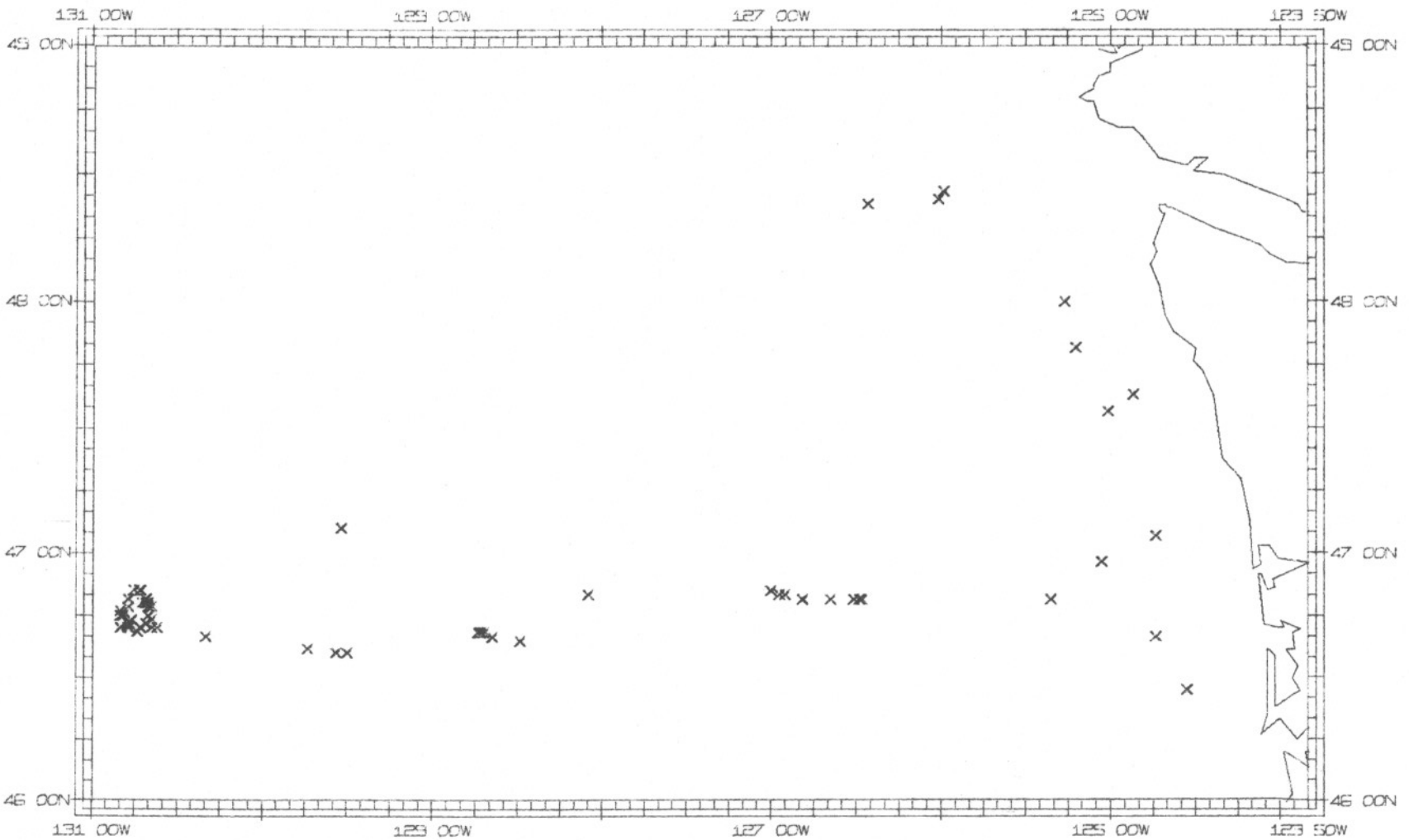


FIGURE 16.--LOCATIONS WHERE FUR SEAL STOMACHS COLLECTED OFF WASHINGTON IN 1972 CONTAINED ONYCHOTEUTHIS SP. (61 OCCURRENCES).

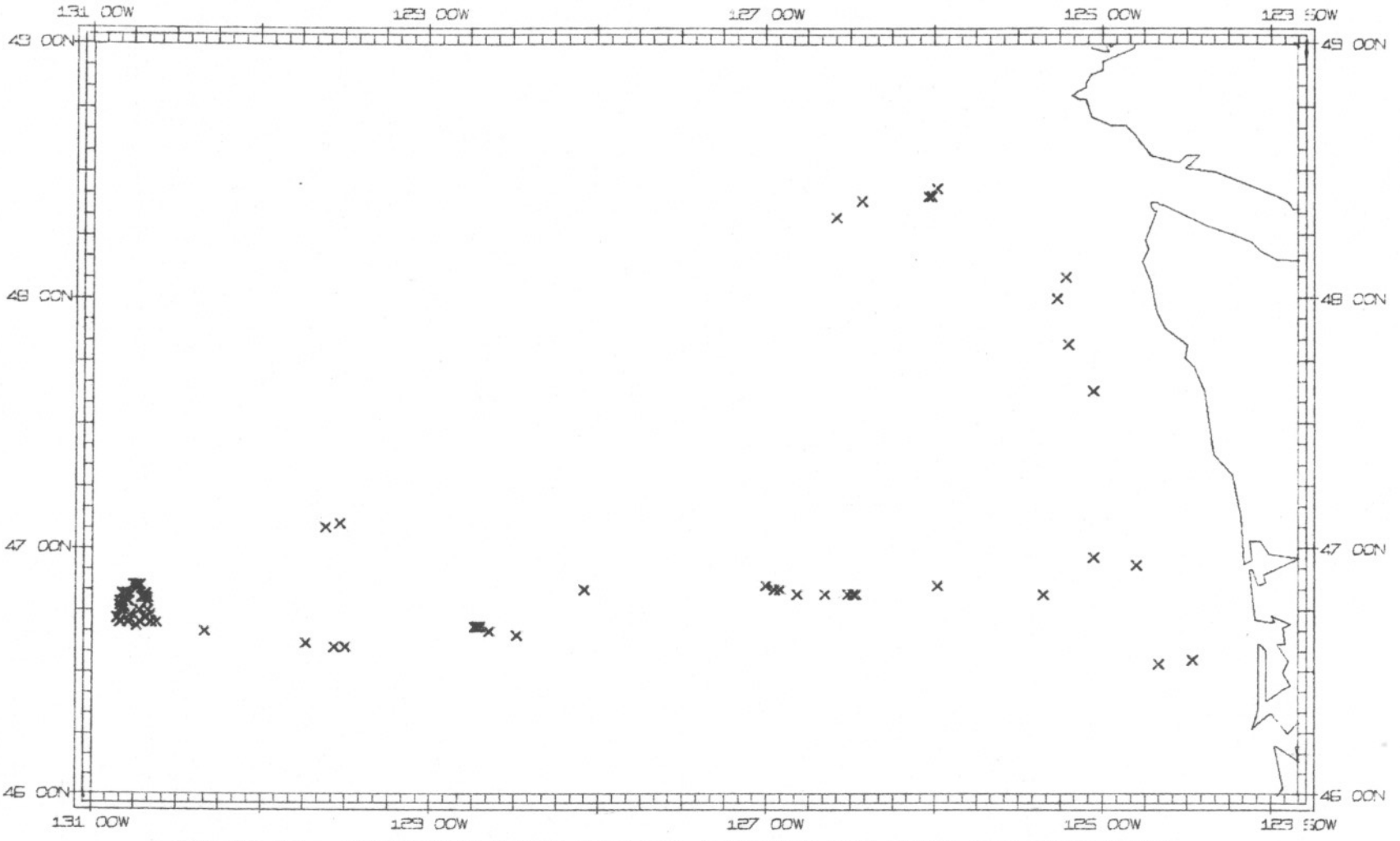


FIGURE 17.--LOCATIONS WHERE FUR SEAL STOMACHS COLLECTED OFF WASHINGTON IN 1972 CONTAINED GONATIDAE (87 OCCURRENCES).

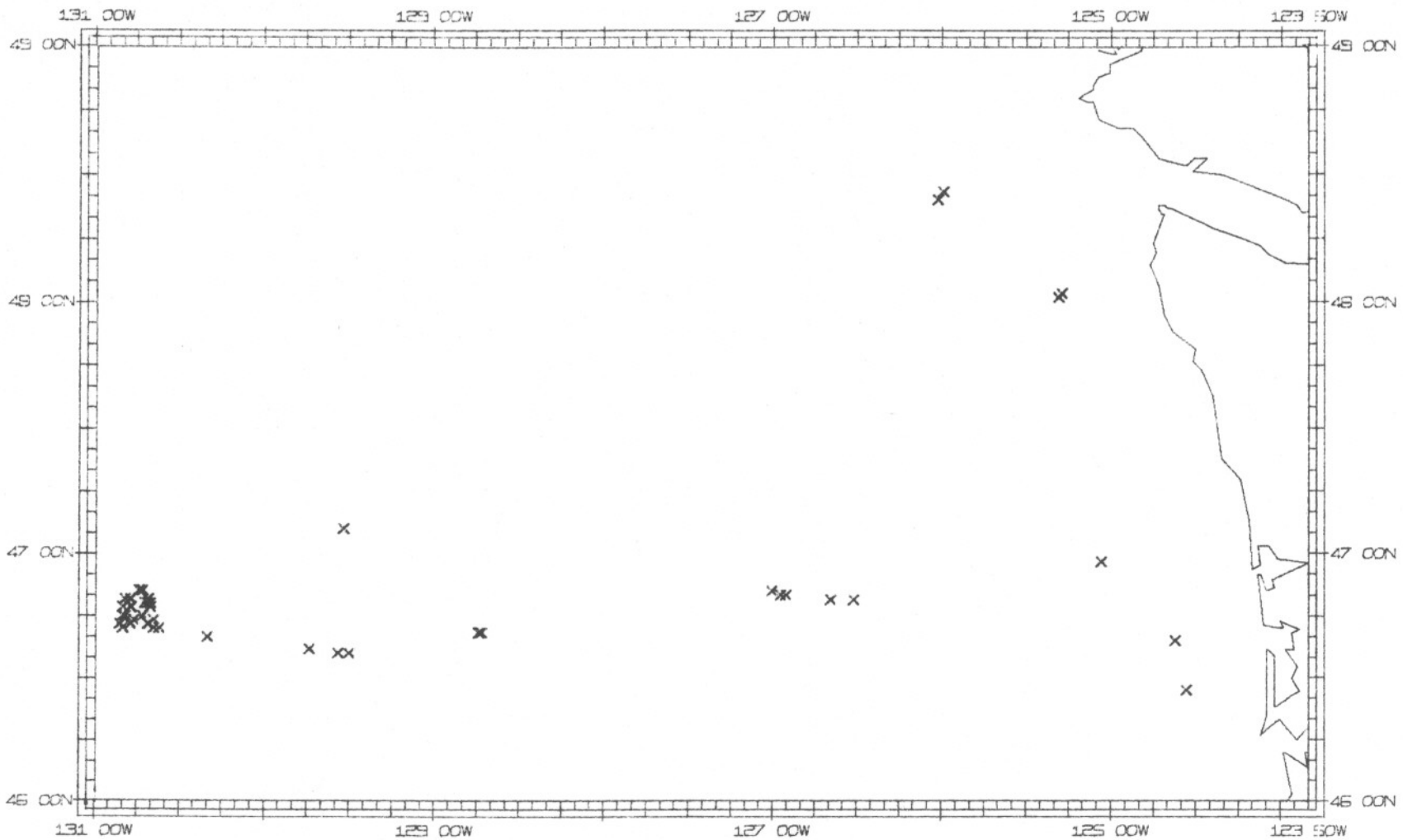


FIGURE 18.--LOCATIONS WHERE FUR SEAL STOMACHS COLLECTED OFF WASHINGTON IN 1972 CONTAINED GONATUS SP. (49 OCCURRENCES).

Table 15.--Stomach contents of fur seals collected pelagically by the United States off Washington, 7 March to 25 May 1972[1/]

Food	Spring March-May Volume Cc.	Volume Percent	Frequency Number
Fish			
Entosphenus tridentatus	250	0.7	3
Clupeidae	140	0.4	4
Alosa sapidissima	2,221	6.0	4
Clupea harengus pallasi	6,448	17.5	18
Engraulis mordax	9,542	26.0	20
Salmonidae	747	2.0	13
Oncorhynchus spp.	643	1.7	2
Osmeridae	5	0.0	1
Mallotus villosus	678	1.8	7
Thaleichthys pacificus	6	0.0	2
Bathylagidae	47	0.1	10
Myctophidae	T	0.0	1
Tarletonbeania crenularis	5	0.0	2
Merluccius productus	70	0.2	1
Sebastes spp.	3,137	8.5	8
Ammodytes hexapterus	245	0.7	1
Pleuronectidae	25	0.1	1
Unidentified	162	0.4	32
Squid			
Loligo opalescens	7	0.0	11
Onychoteuthis sp.	3,597	9.8	61
Moroteuthis robusta	T	0.0	1
Abrailopsis sp.	T	0.0	16
Octopoteuthis sicula	T	0.0	2
Gonatidae	868	2.4	87
Gonatus sp.	18	0.0	49
Berryteuthis magister	2,873	7.8	14
Gonatopsis borealis	5,049	13.7	24
Chiroteuthis veranyi	81	0.2	8
Unidentified	6	0.0	2
Pebbles	T	0.0	1
Parasitic copepods	T	0.0	1
Total	36,870		
Stomachs with food	162		
Stomachs empty	94		
Stomachs missing	1		

1/ T = trace (≤5 cc.). Trace counts are included in frequency counts.

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Table A-1.--Age classification of male seals killed on St. Paul Island, 26 June to 29 July 1972

Date	Rookery 1/	Males killed	Tooth sample	Seals in each age group of sample					Estimated seals killed from each age group				
				2	3	4	5	6	2	3	4	5	6
		Number	Number	Percent					Number				
June													
26	REEF	937	171	0.6	14.6	59.1	24.5	1.2	6	137	554	229	11
27	NEP(east)	310	61	-	8.2	62.3	27.9	1.6	-	25	193	87	5
27	NEP(west)	403	67	1.5	23.9	62.7	11.9	-	6	96	253	48	-
28	ZAP	905	157	-	25.5	60.5	14.0	-	-	231	547	127	-
28	TZR	328	72	-	26.4	65.3	8.3	-	-	87	214	27	-
29	POL	411	79	-	20.3	64.5	15.2	-	-	83	265	63	-
29	TZR	230	45	-	11.1	64.5	22.2	2.2	-	26	148	51	5
30	REEF	647	128	-	16.4	67.2	16.4	-	-	106	435	106	-
30	L-K	308	60	-	21.7	58.3	20.0	-	-	67	179	62	-
July													
1	NEP(east)	178	37	-	10.8	70.3	13.5	5.4	-	19	125	24	10
1	NEP(west)	78	17	-	11.8	70.6	17.6	-	-	9	55	14	-
3	ZAP	566	103	-	28.2	60.2	11.6	-	-	159	341	66	-
3	TZR	122	20	-	20.0	80.0	-	-	-	24	98	-	-
5	REEF	706	134	-	34.4	60.4	5.2	-	-	243	426	37	-
5	L-K	196	42	-	26.2	52.4	21.4	-	-	51	103	42	-
6	POL	365	68	-	17.7	67.6	14.7	-	-	64	247	54	-
6	TZR	852	163	0.6	33.8	58.3	6.7	0.6	5	288	497	57	5
7	NEP(east)	267	46	-	47.8	52.2	-	-	-	128	139	-	-
7	NEP(west)	477	99	-	40.3	58.6	1.1	-	-	192	280	5	-
8	ZAP	372	80	1.2	35.0	51.3	11.3	1.2	4	130	191	43	4
8	TZR	188	30	3.3	43.3	53.4	-	-	6	82	100	-	-
10	REEF	688	131	0.8	38.2	58.0	3.0	-	5	263	399	21	-
10	L-K	265	49	-	30.6	59.2	10.2	-	-	81	157	27	-
11	NEP(east)	374	74	-	37.8	56.8	5.4	-	-	141	213	20	-
11	NEP(west)	682	136	2.2	38.2	56.6	3.0	-	15	261	386	20	-
12	POL	454	82	1.2	39.0	51.2	8.6	-	5	177	233	39	-
12	TZR	808	161	1.9	45.3	50.3	2.5	-	15	366	407	20	-
13	ZAP	654	159	1.9	42.8	48.4	6.9	-	12	280	317	45	-
13	TZR	217	18	-	61.1	38.9	-	-	-	133	84	-	-
14	REEF	936	182	1.6	47.3	47.8	2.7	0.6	15	443	447	25	6
14	L-K	256	49	-	40.8	57.2	2.0	-	-	105	146	5	-
15	NEP(east)	269	43	4.7	58.1	37.2	-	-	13	156	100	-	-
15	NEP(west)	304	74	1.4	63.5	35.1	-	-	4	193	107	-	-
17	POL	374	74	-	27.0	63.5	9.5	-	-	101	237	36	-
17	TZR	734	142	-	45.8	48.6	5.6	-	-	336	358	40	-
18	ZAP	635	124	1.6	55.7	40.3	2.4	-	10	354	256	15	-
18	TZR	374	77	1.3	50.6	41.6	6.5	-	5	189	156	24	-
19	REEF	753	146	2.7	65.8	26.7	4.8	-	20	496	201	36	-
19	L-K	325	58	3.5	44.8	44.8	6.9	-	11	146	146	22	-
20	NEP(east)	676	128	0.8	44.5	45.3	9.4	-	5	301	306	64	-
20	NEP(west)	615	135	2.2	32.6	60.7	4.5	-	14	200	373	28	-
21	POL	359	72	-	34.7	51.4	13.9	-	-	125	184	50	-
21	TZR	403	77	-	42.9	54.5	2.6	-	-	173	220	10	-
22	ZAP	1,530	296	4.1	55.7	34.1	6.1	-	63	852	522	93	-
22	TZR	117	24	-	66.7	29.2	4.1	-	-	78	34	5	-
24	REEF	1,606	306	5.9	60.8	31.4	1.9	-	95	976	504	31	-
24	L-K	527	90	-	67.8	28.9	3.3	-	-	357	152	18	-
25	NEP(east)	1,412	186	3.8	66.1	25.8	3.8	0.5	54	933	364	54	7
25	NEP(west)	556	111	5.4	55.0	36.0	3.6	-	30	306	200	20	-
26	POL	731	128	3.1	50.0	44.5	2.4	-	23	366	325	17	-
26	TZR	351	77	1.3	50.6	45.5	2.6	-	4	178	160	9	-
27	ZAP	2,297	421	8.3	64.4	24.9	2.4	-	191	1,479	572	55	-
27	TZR	614	69	7.3	73.9	17.4	1.4	-	45	454	107	8	-
28	REEF	916	178	7.9	51.7	37.6	2.8	-	72	474	344	26	-
28	L-K	372	52	1.9	51.9	38.5	7.7	-	7	193	143	29	-
28	POL	291	56	5.4	39.3	53.5	1.8	-	16	114	156	5	-
29	NEP(east)	1,149	237	9.7	57.0	25.3	8.0	-	111	655	291	92	-
29	NEP(west)	640	131	4.6	53.4	36.7	5.3	-	29	342	235	34	-
Season total		33,110	6,232						916	15,024	14,932	2,185	53

1/ NEP(east) = east or Morjovi side of Northeast Point; NEP(west) = west or Vostochni side of Northeast Point; TZR = Tolstoi, Zapadni Reef, and Little Zapadni; POL = Polovina and Little Polovina; ZAP = Zapadni; REEF = Reef, Gorbatch, and Ardiguen; L-K = Lukanin and Kitovi.

Table A-2. --Cumulative age classification of male seals killed on St. Paul Island, 26 June to 29 July 1972

Date	Rookery[1/]	Estimated seals killed from each age group					Total kill	Seals killed from each age group				
		2	3	4	5	6		2	3	4	5	6
		Number						Percent				
June												
26	REEF	6	137	554	229	11	937	1	15	59	24	1
27	NEP(east)	6	162	747	316	16	1,247	1	13	60	25	1
27	NEP(west)	12	258	1,000	364	16	1,650	1	16	60	22	1
28	ZAP	12	489	1,547	491	16	2,555	-	19	61	19	1
28	TZR	12	576	1,761	518	16	2,883	-	20	61	18	1
29	POL	12	659	2,026	581	16	3,294	-	20	62	18	-
29	TZR	12	685	2,174	632	21	3,524	-	19	62	18	1
30	REEF	12	791	2,609	738	21	4,171	-	19	63	18	-
30	L-K	12	858	2,788	800	21	4,479	-	19	62	18	1
July												
1	NEP(east)	12	877	2,913	824	31	4,657	-	19	62	18	1
1	NEP(west)	12	886	2,968	838	31	4,735	-	19	63	18	-
3	ZAP	12	1,045	3,309	904	31	5,301	-	20	63	17	-
3	TZR	12	1,069	3,407	904	31	5,423	-	20	63	17	-
5	REEF	12	1,312	3,833	941	31	6,129	-	21	63	15	1
5	L-K	12	1,363	3,936	983	31	6,325	-	22	62	16	-
6	POL	12	1,427	4,183	1,037	31	6,690	-	21	63	16	-
6	TZR	17	1,715	4,680	1,094	36	7,542	-	23	62	15	-
7	NEP(east)	17	1,843	4,819	1,094	36	7,809	-	24	62	14	-
7	NEP(west)	17	2,035	5,099	1,099	36	8,286	-	25	62	13	-
8	ZAP	21	2,165	5,290	1,142	40	8,658	-	25	61	13	1
8	TZR	27	2,247	5,390	1,142	40	8,846	-	25	61	13	1
10	REEF	32	2,510	5,789	1,163	40	9,534	-	26	61	12	1
10	L-K	32	2,591	5,946	1,190	40	9,799	-	27	61	12	-
11	NEP(east)	32	2,732	6,159	1,210	40	10,173	-	27	61	12	-
11	NEP(west)	47	2,993	6,545	1,230	40	10,855	1	28	60	11	-
12	POL	52	3,170	6,778	1,269	40	11,309	1	28	60	11	-
12	TZR	67	3,536	7,185	1,289	40	12,117	1	29	59	11	-
13	ZAP	79	3,816	7,502	1,334	40	12,771	1	30	59	10	-
13	TZR	79	3,949	7,586	1,334	40	12,988	1	30	59	10	-
14	REEF	94	4,392	8,033	1,359	46	13,924	1	31	58	10	-
14	L-K	94	4,497	8,179	1,364	46	14,180	1	32	58	9	-
15	NEP(east)	107	4,653	8,279	1,364	46	14,449	1	32	57	10	-
15	NEP(west)	111	4,846	8,386	1,364	46	14,753	1	33	57	9	-
17	POL	111	4,947	8,623	1,400	46	15,127	1	33	57	9	-
17	TZR	111	5,283	8,981	1,440	46	15,861	1	33	57	9	-
18	ZAP	121	5,637	9,237	1,455	46	16,496	1	34	56	9	-
18	TZR	126	5,826	9,393	1,479	46	16,870	1	34	56	9	-
19	REEF	146	6,322	9,594	1,515	46	17,623	1	36	54	9	-
19	L-K	157	6,468	9,740	1,537	46	17,948	1	36	54	9	-
20	NEP(east)	162	6,769	10,046	1,601	46	18,624	1	36	54	9	-
20	NEP(west)	176	6,969	10,419	1,629	46	19,239	1	36	54	9	-
21	POL	176	7,094	10,603	1,679	46	19,598	1	36	54	9	-
21	TZR	176	7,267	10,823	1,689	46	20,001	1	36	54	9	-
22	ZAP	239	8,119	11,345	1,782	46	21,531	1	38	53	8	-
22	TZR	239	8,197	11,379	1,787	46	21,648	1	38	53	8	-
24	REEF	334	9,173	11,883	1,818	46	23,254	1	40	51	8	-
24	L-K	334	9,530	12,035	1,836	46	23,781	1	40	51	8	-
25	NEP(east)	388	10,463	12,399	1,890	53	25,193	2	42	49	7	-
25	NEP(west)	418	10,769	12,599	1,910	53	25,749	2	42	49	7	-
26	POL	441	11,135	12,924	1,927	53	26,480	2	42	49	7	-
26	TZR	445	11,313	13,084	1,936	53	26,831	2	42	49	7	-
27	ZAP	636	12,792	13,656	1,991	53	29,128	2	44	47	7	-
27	TZR	681	13,246	13,763	1,999	53	29,742	2	45	46	7	-
28	REEF	753	13,720	14,107	2,025	53	30,658	2	45	46	7	-
28	L-K	760	13,913	14,250	2,054	53	31,030	2	45	46	7	-
28	POL	776	14,027	14,406	2,059	53	31,321	2	45	46	7	-
29	NEP(east)	887	14,682	14,697	2,151	53	32,470	3	45	45	7	-
29	NEP(west)	916	15,024	14,932	2,185	53	33,110	3	45	45	7	-

1/ NEP(east) = east or Morjovi side of Northeast Point; NEP(west) = west or Vostochni side of Northeast Point; TZR = Tolstoi, Zapadni Reef, and Little Zapadni; POL = Polovina and Little Polovina; ZAP = Zapadni; REEF = Reef, Gorbatch, and Ardiguen; L-K = Lukanin and Kitovi.

Table A-3.--Age classification of male seals killed on St. George Island, 26 June to 28 July 1972

Date	Rookery[1]	Males killed	Tooth sample	Seals in each age group of sample					Estimated seals killed from each age group				
				2	3	4	5	6	2	3	4	5	6
		Number	Number	Percent					Number				
June													
26	EAST	96	39	-	18.0	25.6	53.8	2.6	-	17	24	52	3
26	NOR	215	40	-	17.5	60.0	20.0	2.5	-	38	129	43	5
28	ZAP	161	33	-	12.1	63.6	24.3	-	-	20	102	39	-
28	NOR	141	28	-	7.2	71.4	14.3	7.1	-	10	101	20	10
30	EAST	176	37	-	21.6	64.9	13.5	-	-	38	114	24	-
30	NOR	52	16	-	18.8	68.7	12.5	-	-	10	36	6	-
30	ZAP	38	35	-	5.7	62.9	28.6	2.8	-	2	24	11	1
July													
3	EAST	63	19	-	15.8	36.8	47.4	-	-	10	23	30	-
3	NOR	100	30	-	26.7	53.3	20.0	-	-	27	53	20	-
3	STAR	76	23	-	30.4	52.2	17.4	-	-	23	40	13	-
8	EAST	58	18	-	16.7	61.1	22.2	-	-	10	35	13	-
8	NOR	165	34	-	29.4	58.8	11.8	-	-	49	97	19	-
11	STAR	96	29	-	31.0	55.2	13.8	-	-	30	53	13	-
11	NOR	82	25	-	24.0	48.0	28.0	-	-	20	39	23	-
11	ZAP	142	29	-	17.2	62.1	20.7	-	-	25	88	29	-
12	EAST	11	10	-	10.0	80.0	10.0	-	-	1	9	1	-
12	NOR	81	24	-	45.8	45.8	8.4	-	-	37	37	7	-
12	ZAP	38	36	-	27.8	66.7	5.5	-	-	11	25	2	-
14	EAST	32	16	-	25.0	62.5	12.5	-	-	8	20	4	-
14	NOR	154	32	-	34.4	59.4	6.2	-	-	53	91	10	-
17	NOR	116	30	-	40.0	56.7	3.3	-	-	46	66	4	-
19	EAST	72	24	-	45.8	41.7	12.5	-	-	33	30	9	-
19	STAR	115	27	-	18.5	63.0	18.5	-	-	21	73	21	-
19	NOR	353	75	-	54.7	44.0	1.3	-	-	193	155	5	-
21	EAST	44	24	4.1	29.2	54.2	12.5	-	2	13	24	5	-
21	NOR	140	32	6.2	37.5	46.9	9.4	-	9	52	66	13	-
21	ZAP	120	35	2.9	40.0	45.7	11.4	-	3	48	55	14	-
24	EAST	170	23	-	30.4	65.2	4.4	-	-	52	111	7	-
24	STAR	68	37	5.4	56.8	35.1	2.7	-	4	38	24	2	-
24	NOR	290	62	4.8	53.2	33.9	8.1	-	14	154	98	24	-
26	EAST	114	29	-	44.8	48.3	6.9	-	-	51	55	8	-
26	NOR	236	51	5.9	39.2	39.2	15.7	-	13	93	93	37	-
26	STAR	90	28	3.6	46.4	46.4	3.6	-	3	42	42	3	-
26	ZAP	73	23	4.4	73.9	21.7	-	-	3	54	16	-	-
28	EAST	48	30	-	53.4	33.3	13.3	-	-	26	16	6	-
28	NOR	45	20	-	35.0	40.0	20.0	5.0	-	16	18	9	2
28	ZAP	133	43	4.6	53.5	32.6	9.3	-	6	71	43	13	-
Season total		4,204	1,146						57	1,442	2,125	559	21

1/ ZAP = Zapadni and South; EAST = East Reef and East Cliffs; NOR = North; STAR = Staraya Artil.

Table A-4. --Cumulative age classification of male seals killed on St. George Island, 26 June to 28 July 1972

Date	Rookery[1/]	Estimated seals killed from each age group					Total kill	Seals killed from each age group				
		2	3	4	5	6		2	3	4	5	6
		Number						Percent				
June												
26	EAST	-	17	24	52	3	96	-	18	25	54	3
26	NOR	-	55	153	95	8	311	-	18	49	30	3
28	ZAP	-	75	255	134	8	472	-	16	54	28	2
28	NOR	-	85	356	154	18	613	-	14	58	25	3
30	EAST	-	123	470	178	18	789	-	16	60	22	2
30	NOR	-	133	506	184	18	841	-	16	60	22	2
30	ZAP	-	135	530	195	19	879	-	16	60	22	2
July												
3	EAST	-	145	553	225	19	942	-	15	59	24	2
3	NOR	-	172	606	245	19	1,042	-	16	58	24	2
3	STAR	-	195	646	258	19	1,118	-	17	58	23	2
8	EAST	-	205	681	271	19	1,176	-	17	58	23	2
8	NOR	-	254	778	290	19	1,341	-	19	58	22	1
11	STAR	-	284	831	303	19	1,437	-	20	58	21	1
11	NOR	-	304	870	326	19	1,519	-	20	57	21	1
11	ZAP	-	329	958	355	19	1,661	-	20	58	21	1
12	EAST	-	330	967	356	19	1,672	-	20	58	21	1
12	NOR	-	367	1,004	363	19	1,753	-	21	57	21	1
12	ZAP	-	378	1,029	365	19	1,791	-	21	58	20	1
14	EAST	-	386	1,049	369	19	1,823	-	21	58	20	1
14	NOR	-	439	1,140	379	19	1,977	-	22	58	19	1
17	NOR	-	485	1,206	383	19	2,093	-	23	58	18	1
19	EAST	-	518	1,236	392	19	2,165	-	24	57	18	1
19	STAR	-	539	1,309	413	19	2,280	-	24	57	18	1
19	NOR	-	732	1,464	418	19	2,633	-	28	55	16	1
21	EAST	2	745	1,488	423	19	2,677	-	28	55	16	1
21	NOR	11	797	1,554	436	19	2,817	-	28	55	16	1
21	ZAP	14	845	1,609	450	19	2,937	-	29	55	15	1
24	EAST	14	897	1,720	457	19	3,107	-	29	55	15	1
24	STAR	18	935	1,744	459	19	3,175	1	29	55	14	1
24	NOR	32	1,089	1,842	483	19	3,465	1	31	53	14	1
26	EAST	32	1,140	1,897	491	19	3,579	1	32	53	14	-
26	NOR	45	1,233	1,990	528	19	3,815	1	32	52	14	1
26	STAR	48	1,275	2,032	531	19	3,905	1	33	52	14	-
26	ZAP	51	1,329	2,048	531	19	3,978	1	33	52	13	1
28	EAST	51	1,355	2,064	537	19	4,026	1	34	51	13	1
28	NOR	51	1,371	2,082	546	21	4,071	1	34	51	13	1
28	ZAP	57	1,442	2,125	559	21	4,204	1	34	51	13	1

1/ ZAP = Zapadni and South; EAST = East Reef and East Cliffs; NOR = North; STAR = Staraya Artil.

Table A-5. --Adult male seals counted, by class[1/] and rookery section, St. Paul Island, 20-23 June 1972

Rookery and class of male	Section														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
	Number														
Lukanin															
1	2	0	-	-	-	-	-	-	-	-	-	-	-	-	2
2	20	16	-	-	-	-	-	-	-	-	-	-	-	-	36
3	16	23	-	-	-	-	-	-	-	-	-	-	-	-	39
4	1	0	-	-	-	-	-	-	-	-	-	-	-	-	1
5	44	0	-	-	-	-	-	-	-	-	-	-	-	-	44
Kitovi[2/]															
1	2(1)	0	3	1	0	-	-	-	-	-	-	-	-	-	7
2	20(8)	3	16	28	20	-	-	-	-	-	-	-	-	-	95
3	17(13)	6	19	26	15	-	-	-	-	-	-	-	-	-	96
4	0(0)	0	0	0	0	-	-	-	-	-	-	-	-	-	0
5	0(0)	0	0	0	66	-	-	-	-	-	-	-	-	-	66
Reef															
1	1	5	0	1	1	3	0	2	2	1	0	-	-	-	16
2	40	70	50	27	46	33	40	35	45	26	19	-	-	-	431
3	15	20	8	8	13	15	2	20	11	18	12	-	-	-	142
4	0	0	0	1	0	0	0	0	0	3	0	-	-	-	4
5	0	0	0	0	217	0	0	8	0	0	22	-	-	-	239
Gorbatch															
1	8	5	1	0	0	0	-	-	-	-	-	-	-	-	14
2	44	42	32	18	24	45	-	-	-	-	-	-	-	-	205
3	19	21	11	6	12	19	-	-	-	-	-	-	-	-	88
4	0	0	0	0	0	1	-	-	-	-	-	-	-	-	1
5	28	0	0	80	0	1	-	-	-	-	-	-	-	-	109
Ardiguen[3/]															
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47
Morjovi[4/]															
1	1(0)	3	2	1	2	2	-	-	-	-	-	-	-	-	11
2	18(20)	11	12	21	20	27	-	-	-	-	-	-	-	-	129
3	14(3)	13	13	15	22	17	-	-	-	-	-	-	-	-	97
4	0(0)	0	0	0	0	0	-	-	-	-	-	-	-	-	0
5	66(3)	0	22	0	0	0	-	-	-	-	-	-	-	-	91
Vostochni															
1	4	0	2	1	0	2	0	1	1	2	0	1	1	0	15
2	27	22	24	15	17	50	28	33	39	19	13	24	46	16	373
3	12	13	11	13	7	19	11	19	16	13	9	16	22	6	187
4	0	0	0	0	0	0	0	1	4	0	0	0	0	0	5
5	17	0	0	21	0	67	0	0	0	0	0	45	4	33	187

Table A-5.--Adult male seals counted, by class[1/] and rookery section, St. Paul Island, 20-23 June 1972--Continued

Rookery and class of male	Section														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	Number														
Little Polovina															
1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	4
2	27	19	-	-	-	-	-	-	-	-	-	-	-	-	46
3	15	9	-	-	-	-	-	-	-	-	-	-	-	-	24
4	1	0	-	-	-	-	-	-	-	-	-	-	-	-	1
5	6	0	-	-	-	-	-	-	-	-	-	-	-	-	6
Polovina															
1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	3
2	19	16	-	-	-	-	-	-	-	-	-	-	-	-	35
3	9	4	-	-	-	-	-	-	-	-	-	-	-	-	13
4	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0
5	41	0	-	-	-	-	-	-	-	-	-	-	-	-	41
Polovina Cliffs															
1	0	1	4	3	5	5	1	-	-	-	-	-	-	-	19
2	13	14	23	19	31	25	61	-	-	-	-	-	-	-	186
3	8	7	12	11	13	7	12	-	-	-	-	-	-	-	70
4	0	1	0	0	0	1	1	-	-	-	-	-	-	-	3
5	0	0	0	0	1	65	1	-	-	-	-	-	-	-	67
Tolstoi															
1	2	1	2	1	1	6	0	2	-	-	-	-	-	-	15
2	25	27	19	16	49	50	42	45	-	-	-	-	-	-	273
3	22	21	12	26	31	39	22	14	-	-	-	-	-	-	187
4	0	3	0	0	0	0	0	0	-	-	-	-	-	-	3
5	0	0	0	0	0	0	0	96	-	-	-	-	-	-	96
Zapadni Reef															
1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0
2	43	16	-	-	-	-	-	-	-	-	-	-	-	-	59
3	20	13	-	-	-	-	-	-	-	-	-	-	-	-	33
4	3	0	-	-	-	-	-	-	-	-	-	-	-	-	3
5	6	18	-	-	-	-	-	-	-	-	-	-	-	-	24
Little Zapadni															
1	0	3	2	1	2	2	-	-	-	-	-	-	-	-	10
2	20	20	34	35	25	20	-	-	-	-	-	-	-	-	154
3	5	18	27	26	19	13	-	-	-	-	-	-	-	-	108
4	0	0	0	0	2	0	-	-	-	-	-	-	-	-	2
5	0	0	0	0	0	45	-	-	-	-	-	-	-	-	45
Zapadni[5/]															
1	0(0)	1	1	3	3	5	5	0	-	-	-	-	-	-	18
2	38(0)	47	44	60	47	28	44	7	-	-	-	-	-	-	315
3	16(0)	25	27	27	19	33	11	9	-	-	-	-	-	-	167
4	0(0)	1	3	0	0	0	3	0	-	-	-	-	-	-	7
5	0(107)	0	0	0	0	0	0	231	-	-	-	-	-	-	338

1/ Class 1 Shoreline - Full-grown males about age 10 and older without females but apparently with established territories at the high tide mark.

Class 2 Territorial without females - Full-grown males about age 10 and older without females but with established territories on the rookery.

Class 3 Territorial with females - Full-grown males about age 10 and older with females and established territories on the rookery.

Class 4 Back fringe - Full-grown and partly grown males about age 7 and older, without females and without territories, that are found along the inland fringe of the rookery.

Class 5 Hauling ground - Full-grown and partly grown males about age 7 and older, without females, that are found on traditional hauling grounds.

Class 3 males were formerly called harem bulls, and Classes 1, 2, 4, and 5 were collectively called idle bulls.

2/ Numbers in parentheses are the adult males counted in Kitovi Amphitheater.

3/ No numbered sections.

4/ Numbers in parentheses are the adult males counted on the second point south of Sea Lion Neck.

5/ Numbers in parentheses are the adult males counted on Zapadni Point Reef.

Table A-6.--Adult male seals counted, by class[1/] and rookery section, St. George Island, 20-22 June 1972

Rookery and class of male	Section 1	2	3	4	5	6	Total
	Number						
Zapadni							
1	5	3	4	-	-	-	12
2	53	30	14	-	-	-	97
3	31	7	9	-	-	-	47
4	0	0	5	-	-	-	5
5	60	0	0	-	-	-	60
South							
1	7	10	8	-	-	-	25
2	44	42	53	-	-	-	139
3	24	2	17	-	-	-	43
4	0	0	0	-	-	-	0
5	37	0	0	-	-	-	37
North							
1	11	6	8	5	6	9	45
2	5	18	21	32	15	27	118
3	29	35	29	28	12	32	165
4	2	5	0	0	1	4	12
5	27	0	0	0	0	49	76
East Cliffs[2/]							
1	14	20	-	-	-	-	34
2	68	16	-	-	-	-	84
3	41	28	-	-	-	-	69
4	0	0	-	-	-	-	0
5	56	0	-	-	-	-	56
Staraya Artil							
1	8	0	-	-	-	-	8
2	60	74	-	-	-	-	134
3	20	4	-	-	-	-	24
4	2	6	-	-	-	-	8
5	10	0	-	-	-	-	10

1/ See table A-5 or glossary for a description of the classes of adult males.

2/ Includes adult male seals counted on East Reef Rookery.

Table A-7 .--Adult male seals counted, by class[1/] and rookery section, Pribilof Islands, Alaska, 11 July 1972

Island, rookery,[2/] and class of male	Section 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
	Number														
St. Paul Island															
Morjovi[3/]															
1	3(3)	5	3	4	3	3	-	-	-	-	-	-	-	-	24
2	8(2)	6	2	3	7	7	-	-	-	-	-	-	-	-	35
3	37(23)	36	34	41	40	45	-	-	-	-	-	-	-	-	256
4	0(0)	1	0	0	3	2	-	-	-	-	-	-	-	-	6
5	44(8)	0	35	0	0	0	-	-	-	-	-	-	-	-	87
Vostochni															
1	1	1	1	0	1	3	3	2	2	2	0	4	7	1	28
2	4	4	1	0	1	3	4	6	12	1	1	9	7	6	59
3	44	32	31	28	27	65	43	50	54	32	51	54	58	39	608
4	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
5	56	0	0	24	0	0	3	0	0	0	0	44	7	30	164
St. George Island															
Zapadni															
1	22	3	4	-	-	-	-	-	-	-	-	-	-	-	29
2	7	0	7	-	-	-	-	-	-	-	-	-	-	-	14
3	85	61	54	-	-	-	-	-	-	-	-	-	-	-	200
4	0	0	2	-	-	-	-	-	-	-	-	-	-	-	2
5	28	0	0	-	-	-	-	-	-	-	-	-	-	-	28
South															
1	7	12	14	-	-	-	-	-	-	-	-	-	-	-	33
2	0	2	6	-	-	-	-	-	-	-	-	-	-	-	8
3	62	76	69	-	-	-	-	-	-	-	-	-	-	-	207
4	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0
5	29	0	0	-	-	-	-	-	-	-	-	-	-	-	29

1/ See table A-5 or glossary for a description of the classes of adult males.

2/ Adult males were counted on selected rookeries only.

3/ Numbers in parentheses are the adult males counted on the second point south of Sea Lion Neck.

Table A-8.--Adult male seals counted, by rookery, Pribilof Islands, Alaska, June 1972

Island and rookery	Date	Class of adult male[1/] 1	2	3	4	5	Total
		Number					
St. Paul Island	June						
Lukanin	21	2	36	39	1	44	122
Kitovi	21	7	95	96	0	66	264
Reef	20	16	431	142	4	239	832
Gorbatch	21	14	205	88	1	109	417
Ardiguen	21	6	44	38	0	47	135
Morjovi	21	11	129	97	0	91	328
Vostochni	21	15	373	187	5	187	767
Little Polovina	20	4	46	24	1	6	81
Polovina	20	3	35	13	0	41	92
Polovina Cliffs	20	19	186	70	3	67	345
Tolstoi	23	15	273	187	3	96	574
Zapadni Reef	23	0	59	33	3	24	119
Little Zapadni	23	10	154	108	2	45	319
Zapadni	23	18	315	167	7	338	845
Total		140	2,381	1,289	30	1,400	5,240
St. George Island							
Zapadni	21	12	97	47	5	60	221
South	21	25	139	43	0	37	244
North	22	45	118	165	12	76	416
East Cliffs[2/]	20	34	84	69	0	56	243
Staraya Artil	20	8	134	24	8	10	184
Total		124	572	348	25	239	1,308
Grand total		264	2,953	1,637	55	1,639	6,548

1/ See table A-5 or glossary for a description of the classes of adult male seals.

2/ Includes adult male seals counted on East Reef Rookery.

Table A-9 .--Adult male seals counted, by rookery, Pribilof Islands, Alaska, July 1972

Island and rookery	Date	Class of adult male[1/]					Total
		1	2	3	4	5	
		Number					
St. Paul Island[2/]	July						
Morjovi	11	24	35	256	6	87	408
Vostochni	11	28	59	608	2	164	861
Total		52	94	864	8	251	1,269
St. George Island[2/]							
Zapadni	11	29	14	200	2	28	273
South	11	33	8	207	0	29	277
Total		62	22	407	2	57	550
Grand total		114	116	1,271	10	308	1,819

1/ See table A-5 or glossary for a description of the classes of adult male seals.

2/ The adult male seals were counted on selected rookeries only.

Table A-10.--Harem and idle male seals counted in mid-July, Pribilof Islands, Alaska, 1961-72

Year	St. Paul Island		St. George Island		Both islands	
	Harem	Idle	Harem	Idle	Harem	Idle
	----Number-----		-----Number----		-----Number-----	
1961	11,163	11,791	2,843	2,489	14,006	14,280
1962	10,332	9,109	2,342	2,650	12,674	11,759
1963	9,212	7,650	2,071	1,890	11,283	9,540
1964	9,085	7,095	1,989	1,489	11,074	8,584
1965	8,553	5,616	1,917	1,113	10,470	6,729
1966	7,974	5,839	1,974	1,017	9,948	6,856
1967	1/7,230	1/4,439	1,646	1,268	8,876	5,707
1968	1/6,176	1/3,100	1,748	1,283	7,924	4,383
1969	2/5,928	2/2,535	1,457	677	7,385	3,212
1970	4,945	1,666	1,466	803	6,411	2,469
1971	3/4,200	3/1,900	1,235	534	5,435	2,434
1972 4/	3,738	2,384	1,153	328	4,891	2,712

1/ Harem and idle males on St. Paul Island were counted on Reef, Lukanin, Kitovi, Tolstoi, and Zapadni Reef Rookeries in 1967, and on Reef, Zapadni Reef, Vostochni, and Morjovi Rookeries in 1968, then extrapolated to produce counts representing all the rookeries.

2/ Includes harem and idle males counted on Sivutch Rookery (Sea Lion Rock).

3/ Harem and idle males on St. Paul Island were counted on Reef, Vostochni, Polovina Cliffs, and Zapadni Reef Rookeries in 1971. Estimates of total number were made based on these counts, the counts on all rookeries in June, and counts made on all rookeries in 1970.

4/ Values for St. Paul Island are extrapolated from July counts on Northeast Point rookeries in 1972 and counts on Northeast Point rookeries and total counts on St. Paul Island in 1970. Values for St. George Island are extrapolated from July counts on Zapadni and South rookeries and counts on Zapadni and South rookeries and the total count on St. George Island in 1971.

Table A-11.--Dead seal pups counted, by rookery sections, Pribilof Islands, Alaska, 21 August to 1 September 1972

Island and rookery	Section														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	Number														
St. Paul Island															
Morjovi	1/688	229	244	400	271	355	-	-	-	-	-	-	-	-	2,187
Vostochni	228	138	236	220	182	1,298	383	503	322	105	161	238	488	199	4,701
Little Polovina	119	253	-	-	-	-	-	-	-	-	-	-	-	-	372
Polovina Cliffs	195	137	202	154	348	223	307	-	-	-	-	-	-	-	1,566
Polovina	259	86	-	-	-	-	-	-	-	-	-	-	-	-	345
Ardiguen 2/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	161
Gorbatch	451	350	198	37	151	145	-	-	-	-	-	-	-	-	1,332
Reef	133	274	222	171	192	239	186	101	70	56	42	-	-	-	1,686
Kitovi	3/177	15	129	170	68	-	-	-	-	-	-	-	-	-	559
Lukanin	240	254	-	-	-	-	-	-	-	-	-	-	-	-	494
Tolstoi	189	242	258	150	452	648	731	870	-	-	-	-	-	-	3,540
Little Zapadni	125	178	340	460	289	294	-	-	-	-	-	-	-	-	1,686
Zapadni Reef	306	199	-	-	-	-	-	-	-	-	-	-	-	-	505
Zapadni	177	443	712	798	530	332	377	146	-	-	-	-	-	-	3,515
Total															22,649
St. George Island															
North	134	160	4/459	-	75	204	-	-	-	-	-	-	-	-	1,032
Zapadni	99	169	63	-	-	-	-	-	-	-	-	-	-	-	331
South	41	54	38	-	-	-	-	-	-	-	-	-	-	-	133
East Cliffs	5/372	-	-	-	-	-	-	-	-	-	-	-	-	-	372
Staraya Artil	450	166	-	-	-	-	-	-	-	-	-	-	-	-	616
Total															2,484
Grand total															25,133

1/ Includes 120 dead pups counted on point south of Sea Lion Neck.

2/ No numbered sections.

3/ Includes 43 dead pups counted in Kitovi Amphitheater.

4/ Includes dead pups counted in section 4.

5/ Includes dead pups counted on East Reef Rookery and in section 2 of East Cliffs Rookery.

Table A-12.--Dead seal pups counted,[1/] by rookery, Pribilof Islands, Alaska, 1963-72

Island and rookery	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
	Number									
St. Paul Island										
Morjovi	2,348	1,830	2,649	1,686	1,072	2,285	734	1,618	4,773	2,187
Vostochni	5,057	3,404	4,214	2,785	1,969	4,195	1,711	3,330	8,280	4,701
Little Polovina	923	631	1,132	449	233	509	200	337	1,207	372
Polovina Cliffs	2,160	1,097	2,856	809	825	1,616	836	1,636	5,445	1,566
Polovina	1,237	783	1,176	312	319	487	327	475	980	345
Ardiguen	141	102	459	160	90	118	112	75	373	161
Gorbatch	2,431	1,549	3,123	1,593	874	1,446	823	974	2,405	1,332
Reef	5,688	3,000	7,664	3,562	2,008	3,064	1,365	2,221	4,103	1,686
Kitovi	881	462	2,202	406	522	755	652	679	1,854	559
Lukanin	546	402	1,126	432	240	597	460	401	1,224	494
Tolstoi	3,274	2,614	3,955	3,425	2,251	3,315	2,778	3,580	5,147	3,540
Little Zapadni	2,580	1,101	2,461	1,634	1,098	1,781	798	1,386	3,223	1,686
Zapadni Reef	718	425	723	451	380	685	177	308	673	505
Zapadni	4,614	4,172	5,384	3,710	2,195	4,445	2,306	3,561	6,752	3,515
Counted total	32,598	21,572	39,124	21,414	14,076	25,298	13,279	20,581	46,439	22,649
Estimated oversight 5%	1,630	1,079	1,956	1,071	704	1,265	664	1,029	2,322	1,132
Total	34,228	22,651	41,080	22,485	14,780	26,563	13,943	21,610	48,761	23,781
St. George Island										
North	2,525	792	1,854	1,561	971	1,567	444	866	1,862	1,032
Zapadni	704	446	1,263	1,196	578	1,197	260	636	1,058	464
East	502	272	676	764	201	824	187	522	638	372
Staraya Artil	1,041	767	1,186	1,152	770	1,055	640	1,243	1,662	616
Counted total	4,772	2,277	4,979	4,673	2,520	4,643	1,531	3,267	5,220	2,484
Estimated oversight 5%	239	114	249	234	126	232	76	163	261	124
Total	5,011	2,391	5,228	4,907	2,646	4,875	1,607	3,430	5,481	2,608
Pribilof Islands counted total[2/]	37,370	23,849	44,103	26,087	16,596	29,941	14,810	23,848	51,659	25,133
Estimated oversight 5%	1,869	1,193	2,205	1,305	830	1,497	740	1,192	2,583	1,256
Total	39,239	25,042	46,308	27,392	17,426	31,438	15,550	25,040	54,242	26,389

1/ The dead pups are counted after 15 August each year; most mortality has occurred by that date.

2/ Not included in the total are 2,228 dead pups counted on Sea Lion Rock (Sivutch) in 1966.

Table A-13.--Seal pups marked by freeze branding, St. Paul Island, 1966-70

Year	Rookery	Marks or symbols used	Seals effectively marked	Location of marks
			---Number----	
1966	Zapadni Reef	S or ᔕ [1/]	40 (♂♂ and ♀♀)	Dorsal surface of front flipper (manus)
1966	Zapadni Reef	---do.---	40 (♂♂ and ♀♀)	Dorsal surface of forearm (antebrachium)
1967	Zapadni Reef	T, ⊣, ⊥, or ⊢ [2/]	115 (♂♂ and ♀♀) [3/]	Do.
1969	Reef	Bar (-) and angle (<) numbering system [4/]	192♂♂ and 183 ♀♀	Dorsal surface of left forearm (antebrachium) and head
1969	Gorbatch	------do.------	200♂♂ and 200 ♀♀	Do.
1970	Reef	------do.------	245♂♂ and 189 ♀♀	Dorsal surface of right forearm (antebrachium) and head
1970	Gorbatch	------do.------	246♂♂ and 218 ♀♀	Do.

1/ For photographs of branded animals, see Fur Seal Investigations, 1966, Marine Mammal Biological Laboratory, Seattle, Wash.

2/ For photograph of a branded animal, see Fur Seal Investigations, 1967, Marine Mammal Biological Laboratory, Seattle, Wash.

3/ In addition, 16 adult females were freeze branded on Kitovi Rookery with letter "U" and "S" instruments on the forearm, shoulder, chest, and rump.

4/ For system of identification symbols used, see Fur Seal Investigations, 1969, Marine Mammal Biological Laboratory, Seattle, Wash.

Table A-14.--Seal pups tagged and marked, Pribilof Islands, Alaska, 1963-72

Year	Series	St. Paul Island	St. George Island	Location of tag	Checkmarks or marks
		------Number-------			
1963	P 1-5000		4,993	Left front flipper	Tip of left front flipper sliced off
	P 5001-25000	19,978		------do.------	Do.
1964	Q 1-5000		4,993	Right front flipper	Tip of right front flipper sliced off
	Q 5001-25000	19,998		------do.------	Do.
1965	R 1-10000	10,000		Left front flipper	"V" notch near tip left front flipper
	Marked	10,007		Not tagged	"V" notch near tip right front flipper
	Marked	10,080		---do----	Tip of 1st digit (big toe) on right hind flipper sliced off
1966	S 1-2500		2,499	Left front flipper	Tip of left front flipper sliced off
	S 2501-12500	10,000		Right front flipper	Tip of 2d digit on right hind flipper sliced off
	Marked	9,578		Not tagged	Tip of 3d digit on right hind flipper sliced off
	Marked		2,503	---do.---	Tip of 2d digit on left hind flipper sliced off
1967	T 9-2500		2,492	Right front flipper	Tip of right front flipper sliced off
	T 5001-15000	9,980		------do.-------	Do.
1968	U 1-2500		2,475	Left front flipper	"V" notch near tip left front flipper
	U 2501-12500	9,200		------do.------	Do.
1969	Marked	20,000		Not tagged	Tip of 1st digit (big toe) on left hind flipper sliced off
	Marked		5,000	----do.---	Tip of 1st digit (big toe) on right hind flipper sliced off
1970	Marked	20,030		Not tagged	Tip of 2d digit on left hind flipper sliced off
	Marked		5,000	----do.---	Tip of 2d digit on right hind flipper sliced off
1971	Marked	19,995		Not tagged	Tip of 3d digit on left hind flipper sliced off
	Marked		5,000	---do.---	Tip of 3d digit on right hind flipper sliced off
1972	Marked	20,019		Not tagged	Tip of 1st digit (big toe) on right hind flipper sliced off
	Marked		5,000	---do.---	Tip of 1st digit (big toe) on left hind flipper sliced off

Table A-15. --Record of tags applied[1/] to male seals selected as yearlings and as 2-year-olds on the basis of body length or size, St. Paul Island, 1961-63 and 1965-71

Age category and year	Tag series	Tag number	Effective tags[2/]
			Number
Yearlings[3/]			
1961	M	1-2000	754
1962	N	50001-51000	929
1963	O	50001-51000	799
1965	1R	1-1000	991
1966	1S	20001-21500	1,495
1967	1T	1-1500	835
1968	1U	20001-21500	714
Age 2			
1966	2S	30001-31500	1,483
1967	2T	1-1500	1,220
1968	2U	30001-31500	1,495
Ages 1-2			
1969	1V	1-3431	3,419
1970	1W	1-4000	3,779
1971	1Y	1-4000	3,992

1/ Each seal was double tagged; one tag was attached at the hairline of each front flipper. Before 1971, seals with tags that had been attached at ages 3-4 months or at ages 1-2 years were given an additional tag.

2/ Total number of seals tagged within the series.

3/ Male and female seals were intentionally tagged in 1961, 1962, 1963, and 1965. From 1966 to 1971, only male seals were selected for tagging.

Table A-16. --Marked, tagged and lost-tag male seals recovered, by age, Pribilof Islands, Alaska, 26 June to 29 July 1972

Mark or tag series	Age	Marks or tags			Lost tags[1]			Grand total
		St. Paul Island	St. George Island	Total	St. Paul Island	St. George Island	Total	
	Years	Number			Number			Number
Hind flipper (LH2)[2]	2	29	-	29	-	-	-	29
Hind flipper (RH2)[2]	2	5	1	6	-	-	-	6
Hind flipper (RH1)[2]	3	96	71	167	-	-	-	167
Hind flipper (LH1)[2]	3	897	44	941	-	-	-	941
U	4	184	13	197	179	22	201	398
T	5	20	16	36	28	3	31	67
S	6	2	-	2	13	2	15	17
Hind flipper (LH2)[2]	6	9	4	13	-	-	-	13
Hind flipper (RH3)[2]	6	10	3	13	-	-	-	13

1/ Seals that had lost their tags but were recognized by a marked flipper.

2/ Seals not tagged but marked by removing part of a flipper--tip of second digit left and right hind flipper (LH2, RH2), tip of first digit left and right hind flipper (LH1, RH1), and tip of third digit right hind flipper (RH3).

Table A-17.--Tag recoveries[1/] from male seals that had been selected and tagged as yearlings and at age 2 or older in previous years, Pribilof Islands, Alaska, 1972

Year tagged and tag series	Age when: Tagged	Age when: Recovered	Total both islands
	Years	Years	Number
1968			
1U	1	5	2
1969			
1V	1	4	36
1V	2	5	80
1V	3	6	1
		[2/] Unknown	7
1970			
1W	1	3	124
1W	2	4	739
1W	3	5	21
		[2/] Unknown	48
1971			
1Y	1	2	7
1Y	2	3	771
1Y	3	4	212
1Y	4	5	4
		[2/] Unknown	49
1968			
2U	2	6	2
		[2/] Unknown	1

1/ In addition to the seals listed, 220 males on St. Paul Island and 22 on St. George Island that had lost both tags were taken.

2/ The tags were recovered but age could not be determined because the flippers or the heads were separated from the carcasses during the skin-stripping process.

Table A-18.--Soviet tags recovered in the United States kill of fur seals, Pribilof Islands, Alaska, 26 June to 29 July 1972

Island and date	Tag number	Age	Sex	Island of tagging	Rookery of recovery
		Years			
St. Paul Island					
29 July	CM-6876	2	M	Medny	Northeast Point
14 July	BB-4528	3	M	Bering	Reef
25 July	BB-5626, BB5635	3	M	Bering	Northeast Point
15 July	BB-7404, BB7450	3	M	Bering	Northeast Point
27 July	BB-8053	3	M	Bering	Zapadni
28 July	BM-2979	3	M	Medny	Reef
18 July	BM-3290	3	M	Medny	Tolstoi-Zapadni Reef
22 July	BM-4600	3	M	Medny	Zapadni
27 July	BM-6377	3	M	Medny	Zapadni
27 July	BM-6739	3	M	Medny	Zapadni
20 July	BM-9863	3	M	Medny	Northeast Point
26 June	AB-2455	4	M	Bering	Reef
21 July	AB-3899	4	M	Bering	Tolstoi-Zapadni Reef
27 July	AB-9262, AB-9292	4	M	Bering	Zapadni
6 July	AB-9631, AB-9679	4	M	Bering	Tolstoi-Zapadni Reef
22 July	AM-3019	4	M	Medny	Zapadni
17 July	AM-3261	4	M	Medny	Tolstoi-Zapadni Reef
24 July	AM-4697	4	M	Medny	Reef
28 June	AM-5581	4	M	Medny	Zapadni
21 July	AM-5586	4	M	Medny	Tolstoi-Zapadni Reef
29 July	AM-6444, AM-6446	4	M	Medny	Northeast Point
18 July	AM-6610	4	M	Medny	Tolstoi-Zapadni Reef
19 July	AM-7116	4	M	Medny	Reef
26 July	AM-9171, AM-9180	4	M	Medny	Polovina
29 June	X-18533	5	M	Bering	Polovina
1 July	X-20961	5	M	Bering	Northeast Point
11 July	X-24963, X-24995	5	M	Bering	Northeast Point
6 July	X-32272, IU-20127	5	M	Medny	Tolstoi-Zapadni Reef
St. George Island					
8 July	AM-465	4	M	Medny	North
26 June	AM-6707	4	M	Medny	North
24 July	X-31205	5	M	Medny	East
26 July	X-35559	5	M	Medny	East

Table B-1.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 7-31 March 1972

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H86-V43	0.2	0.0	0	0
H86-V44	3.3	0.0	0	0
H86-V45	1.6	0.0	0	0
H86-V46	1.3	1.5	2	0
H87-V43	0.1	0.0	0	0
H87-V44	1.5	0.0	0	0
H87-V45	2.9	0.6	2	1
H87-V46	4.6	2.6	12	3
H87-V47	1.5	0.6	1	0
H87-V48	0.2	0.0	0	0
H88-V45	3.6	0.5	2	0
H88-V46	5.0	1.8	9	3
H88-V47	2.1	8.0	17	3
H89-V45	0.3	6.6	2	0
H89-V46	11.2	10.0	113	17
H89-V47	3.6	1.9	7	0
H90-V44	3.1	0.3	1	1
H90-V45	4.8	0.2	1	1
H90-V46	16.8	5.5	94	12
H90-V47	16.1	3.7	60	16
H90-V48	4.2	3.3	14	4
H91-V46	1.2	0.0	0	0
H91-V47	2.0	1.0	2	1
H91-V48	0.9	0.0	0	0
H91-V50	0.3	0.0	0	0
H92-V46	0.1	0.0	0	0
H92-V47	1.2	0.0	0	0
H92-V49	1.0	0.0	0	0
H92-V50	0.3	0.0	0	0
H93-V47	0.9	0.0	0	0
H93-V48	1.0	0.0	0	0
H93-V49	1.1	0.0	0	0

1/ See footnote at end of table.

Table B-1.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 7-31 March 1972--Continued

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H94-V48	0.7	1.4	1	0
H94-V49	3.3	2.4	8	5
H95-V49	2.7	1.4	4	3
H95-V50	0.7	4.2	3	2
H96-V49	0.5	0.0	0	0
H96-V50	3.3	0.9	3	0
H97-V49	1.4	0.0	0	0
H97-V50	3.1	3.2	10	4
H98-V48	1.2	0.0	0	0
H98-V49	1.1	0.0	0	0
H99-V47	1.6	0.0	0	0
H99-V48	1.2	0.0	0	0
H99-V49	0.9	0.0	0	0
H99-V50	1.4	0.0	0	0
H100-V48	0.1	0.0	0	0
H100-V49	0.5	0.0	0	0
H100-V50	1.8	0.0	0	0

1/ The base chart is USCGS No. 5052. The sides of each unit are 10 minutes of latitude by 10 minutes of longitude. The units are located by a system of vertical column and horizontal row numbers. Vertical column numbering begins at the lower right corner of chart (fig. 8) and horizontal row numbering begins at the lower left corner.

Table B-2.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 1-30 April 1972

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H86-V43	0.1	0.0	0	0
H86-V44	3.1	0.0	0	0
H86-V45	0.9	1.1	1	0
H86-V46	1.6	3.1	5	0
H87-V44	1.3	0.0	0	0
H87-V45	4.9	1.8	9	1
H87-V46	2.9	0.0	0	0
H88-V45	1.5	2.0	3	1
H88-V46	7.3	2.6	19	7
H88-V47	7.4	3.1	23	9
H89-V45	0.5	0.0	0	0
H89-V46	3.3	1.8	6	3
H89-V47	7.7	1.5	12	5
H89-V48	5.0	3.4	17	7
H90-V44	2.1	0.0	0	0
H90-V45	2.5	0.8	2	0
H90-V46	2.6	1.1	3	1
H90-V47	8.5	0.9	8	3
H90-V48	8.5	1.8	16	4
H90-V49	2.5	2.4	6	2
H91-V46	0.5	0.0	0	0
H91-V47	1.7	0.5	1	1
H91-V48	4.8	0.8	4	0
H91-V49	1.3	0.7	1	0
H91-V50	0.3	0.0	0	0
H91-V51	1.0	1.0	1	1
H91-V52	1.0	0.0	0	0
H92-V47	1.7	2.9	5	2
H92-V48	1.4	0.0	0	0
H92-V53	1.2	2.5	3	1
H92-V54	0.8	0.0	0	0
H92-V55	0.9	0.0	0	0
H92-V56	0.2	0.0	0	0

1/ See footnote at end of table.

Table B-2.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 1-30 April 1972--Continued

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H93-V47	1.5	0.6	1	0
H93-V51	0.7	0.0	0	0
H93-V52	0.8	0.0	0	0
H93-V53	0.8	1.2	1	0
H93-V54	2.2	1.8	4	0
H93-V55	0.8	0.0	0	0
H93-V56	1.1	0.0	0	0
H94-V47	1.3	3.0	4	1
H94-V48	1.0	1.0	1	1
H94-V51	0.8	0.0	0	0
H95-V48	1.1	0.0	0	0
H95-V49	0.5	0.0	0	0
H95-V51	1.6	1.2	2	1
H96-V49	0.7	0.0	0	0
H96-V50	1.8	0.5	1	0
H96-V51	1.7	0.0	0	0
H96-V52	0.3	3.3	1	0
H97-V49	2.3	1.3	3	0
H97-V50	3.7	1.0	4	1
H97-V51	2.0	2.5	5	3
H97-V52	2.0	0.5	1	0
H97-V53	1.0	0.0	0	0
H97-V54	1.2	2.5	3	2
H98-V47	0.8	0.0	0	0
H98-V48	1.7	0.0	0	0
H98-V49	3.8	0.5	2	1
H98-V50	0.7	0.0	0	0
H98-V54	1.2	0.0	0	0
H99-V46	0.5	0.0	0	0
H99-V47	1.9	0.0	0	0
H99-V48	1.7	0.0	0	0
H99-V49	0.8	0.0	0	0
H99-V50	0.8	0.0	0	0
H99-V51	0.8	0.0	0	0
H99-V52	0.3	0.0	0	0
H99-V54	3.5	1.4	5	5
H100-V53	1.5	0.6	1	1
H100-V54	1.5	0.6	1	1

1/ The base chart is USCGS No. 5052. The sides of each unit are 10 minutes of latitude by 10 minutes of longitude. The units are located by a system of vertical column and horizontal row numbers. Vertical column numbering begins at the lower right corner of chart (fig. 9) and horizontal row numbering begins at the lower left corner.

Table B-3.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 1-25 May 1972

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H86-V43	1.9	0.0	0	0
H86-V44	3.6	0.0	0	0
H86-V45	3.6	0.0	0	0
H86-V46	4.7	0.2	1	0
H86-V47	2.4	0.4	1	0
H86-V48	2.7	0.0	0	0
H86-V49	0.9	0.0	0	0
H86-V50	0.8	0.0	0	0
H86-V51	0.9	0.0	0	0
H86-V52	0.9	0.0	0	0
H86-V53	0.8	0.0	0	0
H86-V54	0.8	0.0	0	0
H86-V55	0.2	0.0	0	0
H87-V46	1.4	0.0	0	0
H87-V47	1.3	0.0	0	0
H87-V48	1.2	0.0	0	0
H87-V70	1.0	0.0	0	0
H88-V46	1.4	0.7	1	0
H88-V48	3.1	0.3	1	0
H88-V63	0.1	0.0	0	0
H88-V64	0.8	1.2	1	0
H88-V65	1.1	6.3	7	0
H88-V66	1.1	0.0	0	0
H88-V67	0.8	1.2	1	0
H88-V68	1.2	0.8	1	0
H88-V69	1.3	1.5	2	1
H88-V70	0.7	0.0	0	0
H88-V71	0.8	2.5	2	0
H88-V72	1.4	0.0	0	0
H88-V73	2.0	1.0	2	0
H88-V74	1.6	1.2	2	0
H88-V75	2.0	0.0	0	0
H88-V76	1.7	1.1	2	2
H88-V77	2.2	1.3	3	1
H88-V78	1.0	2.0	2	0
H88-V79	0.8	0.0	0	0

1/ See footnote at end of table.

Table B-3.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 1-25 May 1972--Continued

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H88-V80	1.2	0.8	1	0
H89-V46	1.2	0.0	0	0
H89-V47	1.1	0.0	0	0
H89-V48	0.8	0.0	0	0
H89-V56	0.5	4.0	2	0
H89-V57	1.2	4.1	5	3
H89-V58	1.1	3.6	4	2
H89-V59	1.4	4.2	6	3
H89-V60	0.8	0.0	0	0
H89-V67	1.2	2.5	3	1
H89-V68	0.9	1.1	1	0
H89-V69	0.8	2.5	2	1
H89-V70	1.5	3.3	5	1
H89-V71	2.9	2.0	6	5
H89-V72	1.2	0.8	1	0
H89-V76	0.3	0.0	0	0
H89-V77	2.8	0.0	0	0
H89-V81	1.0	1.0	1	1
H89-V82	3.5	4.2	15	7
H89-V83	12.8	5.4	70	40
H89-V84	1.5	2.6	4	3
H90-V48	0.5	0.0	0	0
H90-V49	1.1	0.0	0	0
H90-V50	0.8	0.0	0	0
H90-V51	0.9	0.0	0	0
H90-V52	1.4	0.0	0	0
H90-V53	1.3	0.7	1	0
H90-V54	1.2	2.5	3	1
H90-V55	1.0	1.0	1	0
H90-V56	0.5	0.0	0	0
H90-V60	1.1	7.2	8	7
H90-V61	1.2	0.8	1	1
H90-V62	1.2	0.0	0	0
H90-V63	1.2	0.8	1	0
H90-V64	0.8	0.0	0	0

1/ See footnote at end of table.

Table B-3.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 1-25 May 1972--Continued

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H90-V65	0.8	0.0	0	0
H90-V66	0.8	6.2	5	0
H90-V71	1.3	0.7	1	0
H90-V76	2.7	0.3	1	0
H90-V77	0.8	0.0	0	0
H90-V78	0.7	1.4	1	0
H90-V79	1.2	2.5	3	0
H90-V80	1.2	4.1	5	0
H90-V81	1.1	1.8	2	0
H90-V82	0.9	0.0	0	0
H90-V83	3.0	8.0	24	10
H91-V47	0.8	3.7	3	2
H91-V48	0.5	2.0	1	0
H91-V75	0.8	0.0	0	0
H91-V76	2.6	1.1	3	2
H91-V77	1.0	0.0	0	0
H91-V78	0.2	0.0	0	0
H92-V47	1.7	1.7	3	1
H92-V71	0.7	0.0	0	0
H92-V72	0.9	0.0	0	0
H92-V73	1.1	0.0	0	0
H92-V74	1.8	1.6	3	0
H92-V76	1.4	0.7	1	0
H93-V47	1.4	0.0	0	0
H93-V74	0.9	1.1	1	0
H93-V75	1.3	0.0	0	0
H93-V76	3.3	0.9	3	0
H94-V47	1.0	0.0	0	0
H94-V48	0.4	0.0	0	0
H94-V67	1.0	1.0	1	0
H94-V68	1.0	0.0	0	0
H94-V69	0.8	0.0	0	0
H94-V70	0.2	0.0	0	0
H94-V76	0.2	0.0	0	0

1/ See footnote at end of table.

Table B-3.--List of chart units occupied by a research vessel, showing hours in unit, seals seen per hour, and number of seals seen and collected[1/] off Washington, 1-25 May 1972--Continued

Square	Hours in unit	Seals seen per hour	Seals	
			Seen	Collected
	Number	Number	Number	Number
H95-V48	0.9	1.1	1	0
H95-V49	1.1	1.8	2	0
H95-V64	0.8	0.0	0	0
H95-V65	1.2	1.6	2	0
H95-V66	1.0	1.0	1	0
H96-V49	0.4	0.0	0	0
H96-V50	1.1	0.9	1	0
H96-V51	0.7	0.0	0	0
H96-V61	0.6	1.6	1	0
H96-V62	1.3	0.7	1	0
H96-V63	0.8	3.7	3	0
H97-V51	0.8	0.0	0	0
H97-V52	0.8	0.0	0	0
H97-V59	1.0	1.0	1	0
H97-V60	1.0	0.0	0	0
H97-V61	0.2	5.0	1	0
H98-V51	2.2	1.8	4	1
H98-V58	1.5	3.3	5	2
H98-V59	0.5	6.0	3	0
H99-V51	1.0	1.0	1	1
H99-V52	0.8	2.5	2	1
H99-V53	0.9	1.1	1	1
H99-V54	2.4	5.0	12	3
H99-V55	3.5	2.0	7	4
H99-V56	1.0	0.0	0	0
H99-V57	1.5	2.0	3	2
H100-V52	0.3	3.3	1	1
H100-V53	2.5	2.0	5	2
H100-V54	2.4	2.0	5	2
H100-V55	0.9	2.2	2	1

1/ The base chart is USCGS No. 5052. The sides of each unit are 10 minutes of latitude by 10 minutes of longitude. The units are located by a system of vertical column and horizontal row numbers. Vertical column numbering begins at the lower right corner of chart (fig. 10) and horizontal row numbering begins at the lower left corner.

Table B-4. --Number of seals seen, and number seen per boat-hunting day, by 10-day periods, 1/ off Washington, 7 March to 25 May 1972

Period	Boat-hunting days 2/	Total seals seen	Seals seen per boat-hunting day	Seals seen per 10-day interval
	Number	Number	Number	Percent
7-10 Mar.	2.00	36	18.0	4.2
11-20 Mar.	3.75	28	7.5	3.3
21-31 Mar.	6.75	304	45.0	35.8
1-10 Apr.	3.00	54	18.0	6.4
11-20 Apr.	5.50	82	14.9	9.7
21-30 Apr.	5.50	49	8.9	5.8
1-10 May	9.50	233	24.5	27.4
11-20 May	6.00	62	10.3	7.3
21-25 May	1.75	1	0.6	0.1
Total	43.75	849	19.4	100.0

1/ The first and last periods were less than 10 days.

2/ A boat-hunting day is one in which a vessel is used for 8 hours or more; units of boat-hunting days are 0.25, 0.50, 0.75, and 1.00.

Table B-5. --Number of seals collected, and number collected per boat-hunting day, by 10-day periods, 1/ off Washington 7 March to 25 May 1972

Period	Boat hunting days 2/	Seals collected			Seals collected per boat-hunting day	
		Males	Females	Total		
	----------	Number	----------		Number	Percent
7-10 Mar.	2.00	2	10	12	6.0	4.7
11-20 Mar.	3.75	0	6	6	1.6	2.3
21-31 Mar.	6.75	3	55	58	8.6	22.6
1-10 Apr.	3.00	3	13	16	5.3	6.2
11-20 Apr.	5.50	0	32	32	5.8	12.5
21-30 Apr.	5.50	2	15	17	3.1	6.6
1-10 May	9.50	13	84	97	10.2	37.7
11-20 May	6.00	2	17	19	3.2	7.4
21-25 May	1.75	0	0	0	0	0
Total	43.75	25	232	257	5.9	100.0

1/ The first and last periods were less than 10 days.

2/ A boat-hunting day is a day in which a vessel is used for 8 hours or more; units of boat-hunting days are 0.25, 0.50, 0.75, and 1.00.

Table B-6. --Total seals sighted, collected, wounded and lost, and killed and lost between California and the Bering Sea, 1958-72

Year	Total seals sighted[1]	Sighted seals					
		Collected		Wounded and lost		Killed and lost	
	Number	Number	Percent	Number	Percent	Number	Percent
1958	7,024	1,503	21.4	302	4.3	255	3.6
1959	5,919	1,548	26.2	316	5.3	286	4.8
1960	6,287	1,495	23.8	271	4.3	241	3.8
1961	3,415	1,352	40.0	176	5.2	124	3.6
1962	6,111	1,483	24.3	178	2.9	133	2.2
1963	5,790	1,355	23.4	202	3.5	143	2.5
1964	2,864	883	30.8	97	3.4	68	2.4
1965	1,627	419	27.8	50	3.1	45	2.8
1966	2,704	444	16.4	78	2.9	67	2.5
1967[2]	897	132	14.7	27	3.0	22	2.5
1968[3]	2,587	830	32.1	66	2.6	104	4.0
1969	1,136	334	29.4	41	3.6	42	3.7
1970	1,983	405	20.4	78	3.9	69	3.5
1971	1,323	353	26.7	44	3.3	63	4.8
1972	849	257	30.3	19	2.2	44	5.2
Total	50,516	12,793	25.3	1,945	3.8	1,706	3.4

1/ Not all seals sighted are hunted.

2/ Includes 16 days during November and December 1966.

3/ Includes 25 days during November and December 1967.

Table B-7. --Total seals shot, percentage collected, wounded and lost, and killed and lost between California and the Bering Sea, 1958-72

Year	Total seals shot	Seals shot					
		Collected		Wounded and lost		Killed and lost	
	Number	Number	Percent	Number	Percent	Number	Percent
1958	2,060	1,503	73.0	302	14.6	255	12.4
1959	2,150	1,548	72.0	316	14.7	286	13.3
1960	2,007	1,495	74.5	271	13.5	241	12.0
1961	1,652	1,352	81.8	176	10.7	124	7.5
1962	1,794	1,483	82.7	178	9.9	133	7.4
1963	1,700	1,355	79.7	202	11.9	143	8.4
1964	1,048	883	84.3	97	9.3	68	6.4
1965	514	419	81.5	50	9.7	45	8.8
1966	589	444	75.4	78	13.2	67	11.4
1967[1/]	181	132	72.9	27	14.9	22	12.2
1968[2/]	1,000	830	83.0	66	6.6	104	10.4
1969	417	334	80.1	41	9.8	42	10.1
1970	552	405	73.4	78	14.1	69	12.5
1971	460	353	76.7	44	9.6	63	13.7
1972	320	257	80.3	19	5.9	44	13.8
Total	16,444	12,793	77.8	1,945	11.8	1,706	10.4

1/ Includes 16 days during November and December 1966.

2/ Includes 25 days during November and December 1967.

Table B-8. --Number of seals per group among 849 seals sighted off Washington, 7 March to 25 May 1972

Number of seals in group	Group	Seals	
	Number	Number	Percent
1	322	322	37.9
2	124	248	29.2
3	33	99	11.7
4	19	76	9.0
5	7	35	4.1
6	2	12	1.4
7	4	28	3.3
8	2	16	1.9
13	1	13	1.5
Total	514	849	100.0

Table B-9 . --Monthly mean lengths of pregnant female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March		April		May		Combined length		
	Seals	Mean length	Seals	Mean length	Seals	Mean length	Seals	Mean	Standard deviation
Years	Number	Cm.	Number	Cm.	Number	Cm.	Number	Cm.	Cm.
5	-	-	2	116.0	3	121.3	5	119.2	3.35
6	6	119.5	-	-	7	122.6	13	121.2	4.65
7	4	124.5	-	-	7	124.9	11	124.7	4.82
8	6	122.5	5	122.8	5	129.2	16	124.7	6.48
9	2	125.0	3	129.3	3	126.7	8	127.2	4.71
10	5	125.4	5	132.0	4	133.2	14	130.0	5.95
11	6	130.3	2	127.5	6	127.5	14	128.7	4.08
12	2	132.5	1	126.0	4	129.2	7	129.7	4.96
13	4	128.2	3	129.3	1	125.0	8	128.2	2.82
14	2	126.5	1	136.0	1	128.0	4	129.2	-
15	1	127.0	-	-	3	129.0	4	128.5	-
16	-	-	-	-	2	127.5	2	127.5	-
17	-	-	-	-	1	130.0	1	130.0	-
18	-	-	1	128.0	-	-	1	128.0	-
Total	38		23		47		108		

Table B-10. --Monthly mean weights of pregnant female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March		April		May 1/		Combined weight		
	Seals	Mean weight	Seals	Mean weight	Seals	Mean weight	Seals	Mean	Standard deviation
Years	Number	Kg.	Number	Kg.	Number	Kg.	Number	Kg.	Kg.
5	-	-	2	27.0	3	30.7	5	29.2	2.77
6	6	30.5	-	-	7	33.6	13	32.2	2.91
7	4	34.0	-	-	7	35.9	11	35.2	3.16
8	6	31.7	5	34.6	5	35.4	16	33.8	3.80
9	2	33.5	3	38.3	2	37.5	7	36.7	4.19
10	5	36.4	5	43.2	4	40.2	14	39.9	5.80
11	6	40.3	2	39.5	6	40.0	14	40.1	3.71
12	2	42.5	1	35.0	4	40.0	7	40.0	3.56
13	4	38.8	3	40.0	1	38.0	8	39.1	1.55
14	2	40.0	1	49.0	1	42.0	4	42.7	-
15	1	33.0	-	-	3	42.7	4	40.2	-
16	-	-	-	-	2	41.0	2	41.0	-
17	-	-	-	-	1	42.0	1	42.0	-
18	-	-	1	43.0	-	-	1	43.0	-
Total	38		23		46		107		

1/ Weight of one 9-year-old seal missing.

Table B-11. --Monthly mean lengths of nonpregnant female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March		April		May		Combined length		
	Seals	Mean length	Seals	Mean length	Seals	Mean length	Seals	Mean	Standard deviation
Years	Number	Cm.	Number	Cm.	Number	Cm.	Number	Cm.	Cm.
1	5	75.4	1	72.0	2	77.0	8	75.4	4.27
2	-	-	2	89.0	9	93.4	11	92.6	2.98
3	4	96.7	3	102.7	8	101.7	15	100.6	4.88
4	4	107.5	7	109.1	6	108.3	17	108.5	6.00
5	10	114.4	6	115.8	15	115.3	31	115.1	3.80
6	1	123.0	6	115.0	6	120.5	13	118.2	4.41
7	1	115.0	4	117.2	4	127.0	9	121.3	5.70
8	1	136.0	2	130.0	1	129.0	4	131.3	-
9	2	116.5	2	125.0	1	120.0	5	120.6	5.68
10	2	120.5	-	-	1	117.0	3	119.3	-
11	1	132.0	-	-	-	-	1	132.0	-
12	1	128.0	-	-	-	-	1	128.0	-
14	1	127.0	-	-	-	-	1	127.0	-
15	-	-	2	131.0	-	-	2	131.0	-
16	-	-	1	135.0	-	-	1	135.0	-
17	-	-	1	133.0	-	-	1	133.0	-
19	-	-	-	-	1	133.0	1	133.0	-
Total	33		37		54		124		

Table B-12.--Monthly mean weights of nonpregnant female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March 1/		April		May		Combined weight		
	Seals	Mean length	Seals	Mean length	Seals	Mean length	Seals	Mean	Standard deviation
Years	Number	Kg.	Number	Kg.	Number	Kg.	Number	Kg.	Kg.
1	5	8.0	1	5.5	2	8.5	8	7.8	1.46
2	-	-	2	13.5	9	12.9	11	13.0	0.77
3	4	15.5	3	18.0	8	16.6	15	16.6	1.68
4	4	20.7	7	20.4	6	19.7	17	20.2	2.19
5	10	24.0	6	23.7	15	24.4	31	24.1	2.47
6	1	25.0	6	24.2	6	26.0	13	25.1	2.43
7	1	27.0	4	25.7	4	31.7	9	28.6	3.84
8	1	35.0	2	33.5	1	32.0	4	33.5	-
9	2	28.0	2	31.5	1	26.0	5	29.0	3.54
10	1	32.0	-	-	1	23.0	2	27.5	-
11	1	39.0	-	-	-	-	1	39.0	-
12	1	38.0	-	-	-	-	1	38.0	-
14	1	36.0	-	-	-	-	1	36.0	-
15	-	-	2	40.0	-	-	2	40.0	-
16	-	-	1	48.0	-	-	1	48.0	-
17	-	-	1	44.0	-	-	1	44.0	-
19	-	-	-	-	1	36.0	1	36.0	-
Total	32		37		54		123		

1/ Weight of one 10-year-old seal missing.

Table B-13.--Monthly mean lengths of male seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March		April		May		Combined length		
	Seals	Mean length	Seals	Mean length	Seals	Mean length	Seals	Mean	Standard deviation
Years	Number	Cm.	Number	Cm.	Number	Cm.	Number	Cm.	Cm.
1	2	79.5	-	-	1	82.0	3	80.3	-
2	1	88.0	1	100.0	4	100.5	6	98.3	5.61
3	-	-	2	109.0	7	106.1	9	106.8	4.38
4	2	115.5	1	114.0	2	117.5	5	116.0	9.97
5	-	-	1	127.0	-	-	1	127.0	-
6	-	-	-	-	1	140.0	1	140.0	-
Total	5		5		15		25		

Table B-14. --Monthly mean weights of male seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March		April		May		Combined weight		
	Seals	Mean length	Seals	Mean length	Seals	Mean length	Seals	Mean	Standard deviation
Years	Number	Kg.	Number	Kg.	Number	Kg.	Number	Kg.	Kg.
1	2	9.0	-	-	1	9.0	3	9.0	-
2	1	13.0	1	17.0	4	16.0	6	15.7	1.51
3	-	-	2	22.0	7	20.6	9	20.9	2.32
4	2	28.5	1	24.0	2	26.5	5	26.8	4.32
5	-	-	1	33.0	-	-	1	33.0	-
6	-	-	-	-	1	42.0	1	42.0	-
Total	5		5		15		25		

Table B-15.--Monthly mean lengths and weights of fur seal fetuses collected pelagically by the United States off Washington, 7 March to 25 May 1972

Period	Male			Female		
	Fetuses	Mean length	Mean weight	Fetuses	Mean length	Mean weight
	Number	Cm.	Kg.	Number	Cm.	Kg.
7-10 Mar.	2	34.5	1.1	2	35.0	0.9
11-20 Mar.	-	-	-	4	35.5	1.1
21-31 Mar.	18	41.0	1.6	12	41.3	1.6
1-10 Apr.	3	44.5	2.0	4	43.0	1.7
11-20 Apr.	8	50.3	2.6	5	45.9	2.1
21-30 Apr.	-	-	-	3	48.7	2.6
1-10 May	23	52.2	3.3	18	50.3	3.0
11-20 May	4	55.2	3.6	2	54.0	3.0
21-25 May	-	-	-	-	-	-

Table B-16.--Reproductive condition of female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	Nulliparous			Primiparous				Multiparous				Total
				Nonpregnant			Pregnant	Nonpregnant			Pregnant	
	Ovulated			Ovulated				Ovulated				
	Yes	No	Total	Yes 1/	No	Total		Yes 1/	No	Total		
Years	Number											
March												
1	-	5	5	-	-	-	-	-	-	-	-	5
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	4	4	-	-	-	-	-	-	-	-	4
4	-	4	4	-	-	-	-	-	-	-	-	4
5	3	6	9	1[1-R]	-	1	-	-	-	-	-	10
6	-	1	1	-	-	-	1	-	-	-	5	7
7	-	-	-	1	-	1	-	-	-	-	4	5
8	1	-	1	-	-	-	-	-	-	-	6	7
9	-	-	-	-	-	-	-	2	-	2	2	4
10	-	-	-	-	-	-	-	2	-	2	5	7
11	-	-	-	-	-	-	-	1	-	1	6	7
12	-	-	-	-	-	-	-	1	-	1	2	3
13	-	-	-	-	-	-	-	-	-	-	4	4
14	-	-	-	-	-	-	-	1	-	1	2	3
15	-	-	-	-	-	-	-	-	-	-	1	1
Total	4	20	24	2[1-R]	-	2	1	7	-	7	37	71
April												
1	-	1	1	-	-	-	-	-	-	-	-	1
2	-	2	2	-	-	-	-	-	-	-	-	2
3	-	3	3	-	-	-	-	-	-	-	-	3
4	-	7	7	-	-	-	-	-	-	-	-	7
5	-	5	5	1[1-R]	-	1	1	-	-	-	1	8
6	2	3	5	-	1	1	-	-	-	-	-	6
7	3	1	4	-	-	-	-	-	-	-	-	4
8	-	-	-	1	-	1	-	1	-	1	5	7
9	-	1	1	-	-	-	-	-	1	1	3	5
10	-	-	-	-	-	-	-	-	-	-	5	5
11	-	-	-	-	-	-	-	-	-	-	2	2
12	-	-	-	-	-	-	-	-	-	-	1	1
13	-	-	-	-	-	-	-	-	-	-	3	3
14	-	-	-	-	-	-	-	-	-	-	1	1
15	-	-	-	-	-	-	-	2	-	2	-	2
16	-	-	-	-	-	-	-	1	-	1	-	1
17	-	-	-	-	-	-	-	1	-	1	-	1
18	-	-	-	-	-	-	-	-	-	-	1	1
Total	5	23	28	2[1-R]	1	3	1	5	1	6	22	60
May												
1		2	2	-	-	-	-	-	-	-	-	2
2	-	9	9	-	-	-	-	-	-	-	-	9
3	-	8	8	-	-	-	-	-	-	-	-	8
4	-	6	6	-	-	-	-	-	-	-	-	6
5	2	13	15	-	-	-	1	-	-	-	2	18
6	2	2	4	1	-	1	3	1	-	1	4	13
7	2	2	4	-	-	-	1	-	-	-	6	11
8	1	-	1	-	-	-	-	-	-	-	5	6
9	-	-	-	-	-	-	-	-	1	1	3	4
10	-	-	-	-	-	-	-	-	1	1	4	5
11	-	-	-	-	-	-	-	-	-	-	6	6
12	-	-	-	-	-	-	-	-	-	-	4	4
13	-	-	-	-	-	-	-	-	-	-	1	1
14	-	-	-	-	-	-	-	-	-	-	1	1
15	-	-	-	-	-	-	-	-	-	-	3	3
16	-	-	-	-	-	-	-	-	-	-	2	2
17	-	-	-	-	-	-	-	-	-	-	1	1
19	-	-	-	-	-	-	-	1	-	1	-	1
Total	7	42	49	1	-	1	5	2	2	4	42	101

1/ The nonpregnant ovulated columns include seals that resorbed a conceptus (indicated [number-R] thus).

Table B-17.--Reproductive condition of female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972 (Standardized Commission table)

Age	Sample size	Immature	Mature: Ovulated: Pregnant	Mature: Ovulated: Nonpregnant 1/	Mature: Not ovulated
			March		
1	5	5	-	-	-
2	-	-	-	-	-
3	4	4	-	-	-
4	4	4	-	-	-
5	10	9	-	1 [1-R]	-
6	7	1	6	-	-
7	5	-	4	1	-
8	7	1	6	-	-
9	4	-	2	2	-
10	7	-	5	2	-
11	7	-	6	1	-
12	3	-	2	1	-
13	4	-	4	-	-
14	3	-	2	1	-
15	1	-	1	-	-
Total	71	24	38	9 [1-R]	-
			April		
1	1	1	-	-	-
2	2	2	-	-	-
3	3	3	-	-	-
4	7	7	-	-	-
5	8	5	2	1 [1-R]	-
6	6	5	-	-	1
7	4	4	-	-	-
8	7	-	5	2	-
9	5	1	3	-	1
10	5	-	5	-	-
11	2	-	2	-	-
12	1	-	1	-	-
13	3	-	3	-	-
14	1	-	1	-	-
15	2	-	-	2	-
16	1	-	-	1	-
17	1	-	-	1	-
18	1	-	1	-	-
Total	60	28	23	7 [1-R]	2

1/ See footnote at end of table.

Table B-17.--Reproductive condition of female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972--Continued
(Standardized Commission table)

Age	Sample size	Immature	Mature: Ovulated: Pregnant	Mature: Ovulated: Nonpregnant 1/	Mature: Not ovulated
			May		
1	2	2	-	-	-
2	9	9	-	-	-
3	8	8	-	-	-
4	6	6	-	-	-
5	18	15	3	-	-
6	13	4	7	2	-
7	11	4	7	-	-
8	6	1	5	-	-
9	4	-	3	-	1
10	5	-	4	-	1
11	6	-	6	-	-
12	4	-	4	-	-
13	1	-	1	-	-
14	1	-	1	-	-
15	3	-	3	-	-
16	2	-	2	-	-
17	1	-	1	-	-
19	1	-	-	1	-
Total	101	49	47	3	2
			March-May		
1	8	8	-	-	-
2	11	11	-	-	-
3	15	15	-	-	-
4	17	17	-	-	-
5	36	29	5	2 [2-R]	-
6	26	10	13	2	1
7	20	8	11	1	-
8	20	2	16	2	-
9	13	1	8	2	2
10	17	-	14	2	1
11	15	-	14	1	-
12	8	-	7	1	-
13	8	-	8	-	-
14	5	-	4	1	-
15	6	-	4	2	-
16	3	-	2	1	-
17	2	-	1	1	-
18	1	-	1	-	-
19	1	-	-	1	-
Total	232	101	108	19 [2-R]	4

1/ The nonpregnant ovulated columns include seals that resorbed a conceptus (indicated [number-R] thus).

Table B-18.--Pregnancy rates of female seals collected pelagically by the United States off Washington, 7 March to 25 May 1972

Age	March			April			May			Combined data	
	Seals	Pregnant		Seals	Pregnant		Seals	Pregnant		Mar.-May Pregnant	1958-72 pelagic collections Pregnant
Years	Number	Number	Percent	Number	Number	Percent	Number	Number	Percent	Percent	Percent
3	4	-	0.0	3	-	0.0	8	-	0.0	0.0	0.3
4	4	-	0.0	7	-	0.0	6	-	0.0	0.0	2.9
5	10	-	0.0	8	2	25.0	18	3	16.7	13.9	37.0
6	7	6	85.7	6	-	0.0	13	7	53.8	50.0	71.2
7	5	4	80.0	4	-	0.0	11	7	63.6	55.0	79.4
8	7	6	85.7	7	5	71.4	6	5	83.3	80.0	85.7
9	4	2	50.0	5	3	60.0	4	3	75.0	61.5	88.7
10	7	5	71.4	5	5	100.0	5	4	80.0	82.4	88.1
11	7	6	85.7	2	2	100.0	6	6	100.0	93.3	88.6
12	3	2	66.7	1	1	100.0	4	4	100.0	87.5	87.7
13	4	4	100.0	3	3	100.0	1	1	100.0	100.0	86.4
14	3	2	66.7	1	1	100.0	1	1	100.0	80.0	83.1
15	1	1	100.0	2	-	0.0	3	3	100.0	66.7	82.0
16	-	-	-	1	-	0.0	2	2	100.0	66.7	79.9
17	-	-	-	1	-	0.0	1	1	100.0	50.0	67.6
18	-	-	-	1	1	100.0	-	-	-	100.0	67.6
19	-	-	-	-	-	-	1	-	0.0	0.0	53.8

Table B-19.--Special collections (cruise 35) made off Washington in 1972

Specimens or materials	Requester	Use
3 fur seal carcasses (skinned, frozen)	Arthur W. English Dept. of Anatomy College of Medicine University of Illinois Medical Center, Chicago	Anatomy-morphology of forelimb of pinnipeds
28 male, 25 female fur seal fetuses	Marine Mammal Div.	To fill requests for fetal material
Tissue samples from 6 seals (muscle, kidney, liver, brain, blubber)	Dr. Robert Ting Puerto Rico Nuclear Center, University of Puerto Rico Mayaguez, P. R.	Mercury analysis in tissues
5 fur seal yearlings frozen in the round	Dr. Mark C. Keyes Marine Mammal Div.	Demonstration and classroom dissection
Blubber (fat) samples frozen--special instructions, 29 pregnant females, 26 nonpregnant females	Raymond E. Anas Environmental Conservation Div. NWFC	Pesticide and heavy metal analysis
6 fur seal heads with neck attached--frozen	Pribilof Islands Program Director, Northwest Region, NMFS	Battelle Laboratory humane killing project
Samples of fur seal meat, blubber (fat), and liver	Angustine Tu Seattle, WA	To use in developing market for fur seal products
1 Pacific-striped dolphin	Marine Mammal Div.	Tissue samples for pesticide and heavy metal studies, food studies, and skeleton for collection.

Appendix C

PERSONS ENGAGED IN FUR SEAL RESEARCH IN 1972

Name	Field work schedule Start	Finish	Affiliation	Work
		Pribilof Islands		
		Permanent employees		
Ancel M. Johnson	2 June	9 June	Marine Mammal Division	Seal research, general
Patrick Kozloff	9 June	28 Sept.	-----do.------	Do.
Alton Y. Roppel	23 June	8 July	-----do.------	Do.
	5 Sept.	12 Sept.		
Hiroshi Kajimura	30 June	8 July	-----do.------	Do.
Mark C. Keyes	7 July	29 July	-----do.------	Seal research, mortality
George Y. Harry, Jr.	21 Oct.	31 Oct.	-----do.------	Director
Lavrenty Stepetin	When needed		St. Paul Island resident	Seal research general
		Temporary employees		
Richard Larson	2 June	12 Sept.	Student, U. of Wash.	Seal research, general
Dionsey Bourdukofsky	19 June	28 Sept.	St. Paul Island resident	Do.
Ronald G. Pletnikoff	26 June	5 Sept.	Student, Southwestern College, Winfield	Do.
Anthony Philemonoff	26 June	19 Sept.	Student, Alaska Methodist U.	Do.
Perfenia Pletnikoff, Jr.	26 June	28 Sept.	Student, Seattle Community College	Do.
Thomas R. Wilson	6 July	15 Aug.	Student, U. of Wash.	Seal research, mortality
		Pelagic Investigations		
		Permanent employees		
Hiroshi Kajimura	1 Mar.	3 Apr.	Marine Mammal Division	Seal research, general
Clifford H. Fiscus	4 Apr.	27 Apr.	-----do.------	Do.
Allen Wolman	28 Apr.	26 May	-----do.------	Do.
		Temporary employees		
Richard O. Larson	1 Mar.	26 May	Marine Mammal Division	Seal research, general

Field work schedule

Name	Start	Finish	Affiliation	Work
		San Miguel Island		
		Permanent employees		
Ancel M. Johnson	15 May	24 May	Marine Mammal	Fur seal
	22 June	26 June	Division	biology
		Temporary employees		
Robert L. DeLong	15 May	7 Sept.	Marine Mammal Division	Fur seal biology