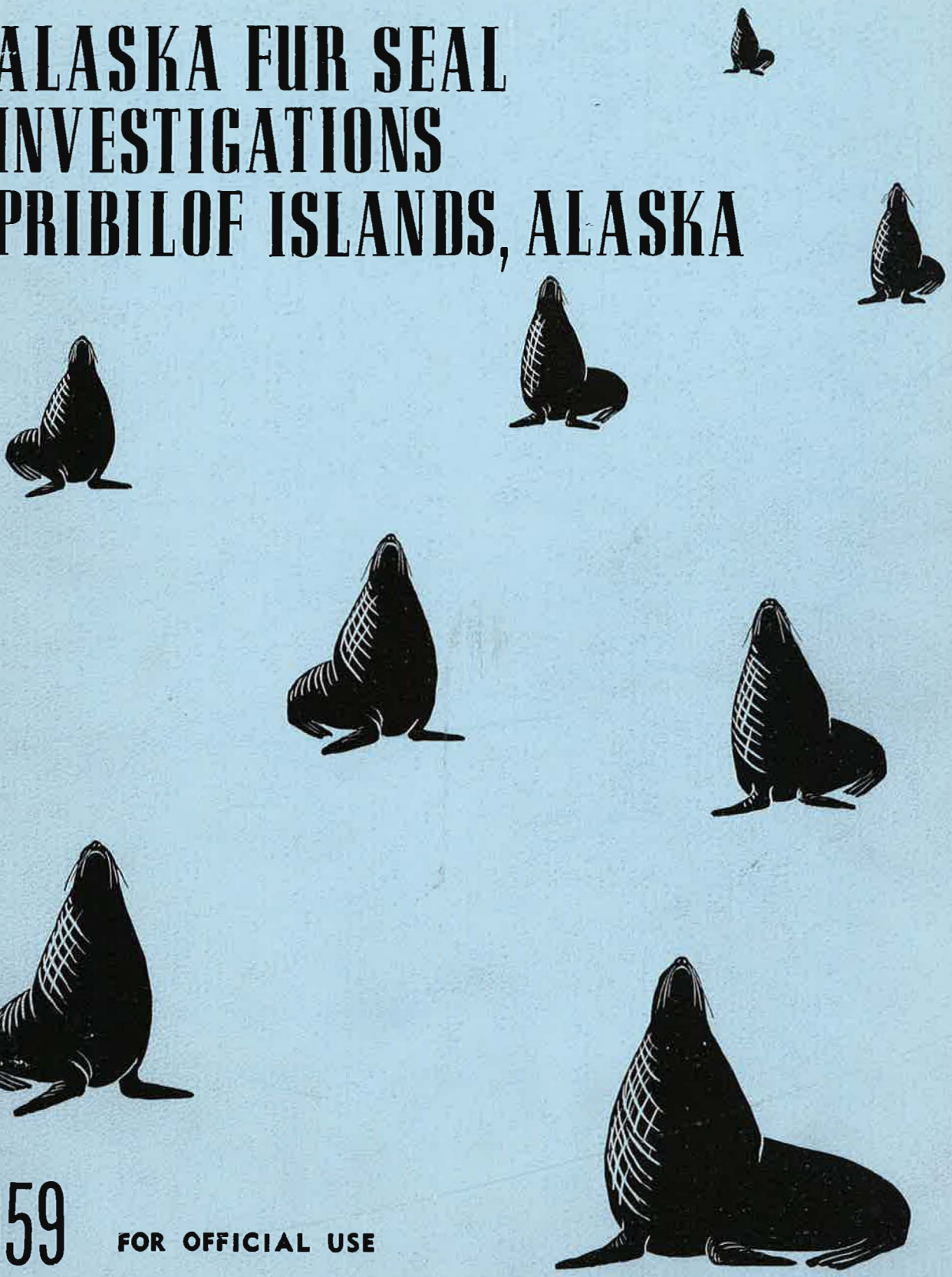
# ALASKA FUR SEAL INVESTIGATIONS PRIBILOF ISLANDS, ALASKA



1959

FOR OFFICIAL USE

# ALASKA FUR SEAL INVESTIGATIONS

# PRIBILOF ISLANDS, ALASKA

Report of Field Activities

June - September 1959

United States Fish and Wildlife Service
Bureau of Commercial Fisheries
Marine Mammal Research
Seattle, Washington

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## INTRODUCTION

### The Problem

Reaching the objective of fur-seal research and management, maximum sustained productivity from the Pribilof seal herd, is now complicated by acute fluctuations in the size of year classes. When the experimental approach to the calculated point of maximum yield began in 1956, year-class fluctuations were moderate, as they apparently had been since commercial sealing resumed after the Convention of 1911. These sharp fluctuations stimulated renewed emphasis on ways to forecast year-class success and, consequently, the probable size of the kill. Island seal-pup mortality, number of 2-year-old seals taken, and early season kills of 3-year-old seals have shown some promise as indicators for making kill-size predictions. Measurements of condition or growth may be supplementary information indicative of the relative success of a year class. Recent studies suggest an inverse relationship between the return of bachelors and year-class size.

The 1959 harvest fell to levels experienced in the late 1920's. Explanations were sought since, after four years of purposely including females in the kill, a smaller rather than a larger harvest was being taken. The reasons for the year-class fluctuations are only partly understood at present. Understanding of fur-seal biology and population dynamics has much improved in the past four years but, frequently, additional knowledge only reveals the intricacy of the problem and suggests a need for more investigation.

Adequate methods of sampling are difficult to devise and apply. At various times, fur seals are segregated by age, sex, and reproductive function. The distance of separation may be a few hundred yards or several thousand miles. As analysis of samples produced inconsistencies, the trend has been to take larger samples. The current program of tagging 50,000 seal pups annually on the Pribilof Islands was put into effect in order to study mixing of populations at sea, but it appears not to be unnecessarily large for island population research.

Research is intended to supply information needed for management of the seal herd with consideration given to basic research useful as a starting point for management research and to information needed by the North Pacific Fur Seal Commission. Generally, the applied research provided for management is also the information needed by the Fur Seal Commission.

## Personnel

Field season studies began 20 June with the arrival of biologists, Alton Roppel and Gary Baines, and Thomas Juelson, fishery aid, on St. Paul Island. Roppel went to St. George Island on 22 June and remained there, except for the bull-counting period spent on St. Paul Island, until his return to Seattle on the vessel "Penguin" in October. Baines went to St. George in early June and remained until 28 August, returning to St. Paul Island on the supply ship. Biologist-in-charge Carl Abegglen and David Reilly, fishery aid, arrived on St. Paul Island, 10 July, remaining until 4 September. Ford Wilke, Chief, Marine Mammal Research, arrived on St. Paul Island 25 July, departed 2 August on M/V "John N. Cobb" for Chukchi Sea as observer for marine mammals. Biologist Thomas O'Brien and fishery aid Terence O'Brien arrived on St. Paul Island 31 July; Terence O'Brien remained until 11 September and Thomas O'Brien departed on 19 October.

Dr. D. G. Chapman, Laboratory of Statistical Research, University of Washington, analyzed population statistics under a contract with the University of Washington.

The Branch of Marine Mammal Research contracted with the University of Colorado for that institution to do research on the biology of the hookworm. Dr. O. Wilford Olsen, University of Colorado, is in charge of the study. Dr. Olsen and his assistant, Dale Masters, arrived on St. Paul Island 10 July. Dr. Olsen departed on 1 August and Masters departed approximately 24 November.

Mr. Arne Suomela, Commissioner, U. S. Fish and Wildlife Service; Mr. Ralph Baker, Chief, Division Resource Management, Bureau of Commercial Fisheries; and Mr. Roger Hager, Canadian member of the North Pacific Fisheries Commission, examined research operations on St. Paul Island.

The research staff appreciates the considerable assistance and cooperation given to them throughout the season by Mr. Clarence L. Olson, General Manager; Mr. Roy Hurd, St. Paul Island Manager; and Mr. Dan Benson, St. George Island Manager.

# POPULATION

## Males

### Age Classification

The kill of 30,195 males during the 1959 season was the lowest since 1957 when 24,942 were killed. This is less than half the average male kill since 1939.

The high mortality of 1956, when 120,000 dead seal pups were recorded, is apparently correlated with the low 1959 kill. Such years of high land mortality may also contribute to considerable ocean mortality through general weakening of the pup class with hookworm infestations and assorted injuries. Other effects of peak populations, such as years of poor food supply, also must have affected the 1956 year class but observations and measurements were not made. Approximately 27,000 females were killed in 1956. Fifty-six percent of them had been pregnant that season but it is not known how many successfully bore living pups (56 percent x 27,000 females = 15,120 pups). About 20 percent of the pups died on the islands (15,120 pups minus 20 percent [3,024] = 12,096 surviving pups). Ocean mortality is doubtless variable but returns of tagged seals suggest that usually not more than 25 percent survive to age 3. This loss includes land pup mortality (25 percent x 15,120 pups = 3,780 pups surviving at age 3). One half of these are females so the possible reduction in the male kill is $\frac{3,780}{2}$ = 1,890. Plainly, female killing in 1956 could not have made an appreciable difference in the 1959 male harvest.

Sampling of the commercial male kill followed the procedure established in 1956 (1956 report). On St. Paul Island, 2,466 upper right male canine teeth were taken as samples for age determination and 565 were taken on St. George Island.

The season began with a normal distribution of 3- and 4-year-old seals. By the end of the season, nearly equal numbers of these two year classes had been taken (figs. 1 and 2). This balance resulted from a combination of the moderately successful 1955 and the weak 1956 year classes. In 1958, the 1955 year class dominated the kill as 3-year-old seals because they were combined with the weak year class of 1954, appearing as 4-year-olds. However, the 1959 kill of 4-year-olds was increased somewhat by an extension of the killable size limit by one inch. Tables 1 and 2 show age composition and cumulative number of males killed on St. Paul Island, 1954-59.

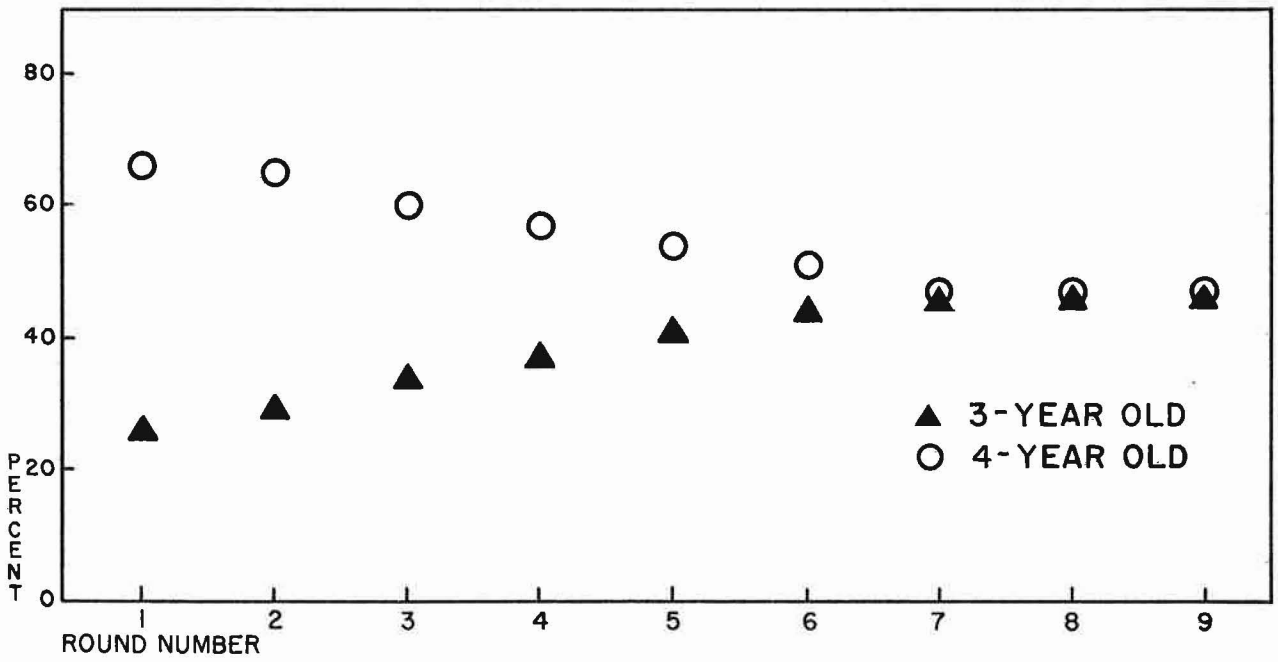


Figure 1. -- Percent 3- and 4-year-old male seals in cumulative commercial kill, by round, St. Paul Island, 1959.

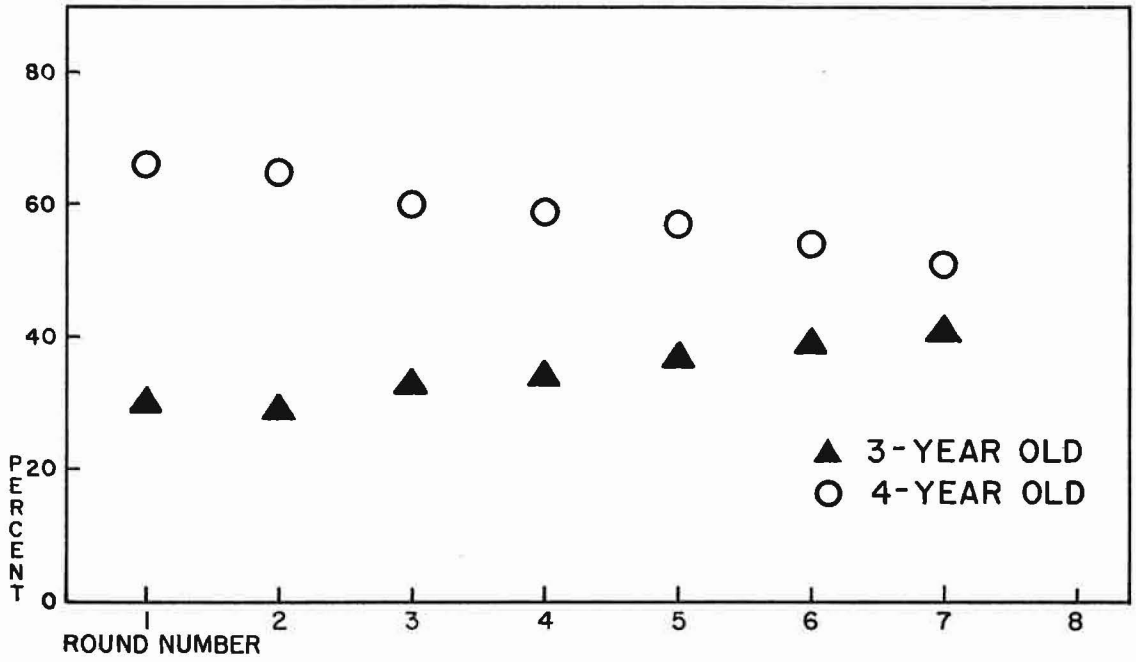


Figure 2. --Percent 3- and 4-year-old male seals in cumulative commercial kill, by round, St. George Island, 1959.

Table 1. --Percent age composition of male kill at various levels, St. Paul Island, 1954 - 1959

| Date | Kill level | Age | |
|---|---|---|---|
| | | 3 | 4 |
| | | Percent | Percent |
| 1954 4 July | 10,000 | 44 | 54 |
| 11 | 20,000 | 49 | 49 |
| 18 | 30,000 | 56 | 41 |
| 27 | 50,000 | 65 | 31 |
| 1955 9 July | 10,000 | 50 | 48 |
| 16 | 20,000 | 54 | 44 |
| 22 | 30,000 | 56 | 42 |
| 31 | 50,000 | 62 | 36 |
| 1956 6 July | 10,000 | 24 | 64 |
| 11 | 20,000 | 30 | 62 |
| 16 | 30,000 | 33 | 60 |
| 26 | 50,000 | 41 | 52 |
| 1957 13 July | 10,000 | 53 | 41 |
| 24 | 20,000 | 63 | 33 |
| 6 August | 30,000 | 68 | 27 |
| 10 | 34,055 | 69 | 26 |
| 1958 10 July | 10,000 | 74 | 26 |
| 18 | 20,000 | 78 | 22 |
| 28 | 30,000 | 80 | 19 |
| 31 | 33,325 | 82 | 17 |
| 1959 14 July | 10,000 | 38 | 57 |
| 26 | 20,000 | 44 | 51 |
| 20 August | 24,495 | 44 | 44 |

Table 2. -- Cumulative number of male seals killed, St. Paul Island, 1954-1959

| | 1954 | | 1955 | | 1956 | | 1957 | | 1958 | | 1959 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Age | | | | | | | |
| Date | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 |
| July | | | | | | | | | | | | |
| 1 | 3367 | 3952 | 1574 | 1962 | 1079 | 3056 | 1360 | 1071 | 1991 | 732 | 483 | 1466 |
| 6 | 5075 | 6258 | 3341 | 3643 | 2671 | 7060 | 2994 | 2161 | 3988 | 1383 | 1359 | 3018 |
| 11 | 9643 | 9667 | 5929 | 6248 | 6145 | 12677 | 4507 | 3296 | 8038 | 2658 | 2621 | 4655 |
| 16 | 15106 | 11461 | 10416 | 8999 | 9808 | 17954 | 6777 | 4651 | 12917 | 3912 | 4188 | 6417 |
| 21 | 22198 | 13301 | 15358 | 11648 | 14589 | 22159 | 9380 | 5602 | 17688 | 4839 | 6095 | 7941 |
| 26 | 30598 | 14995 | 21707 | 15638 | 20726 | 25999 | 13350 | 6784 | 22661 | 5279 | 8326 | 9713 |
| 31 | 32352 | 15365 | 30733 | 18083 | 26590 | 28560 | 16804 | 7547 | 27216 | 5556 | 10202 | 10438 |
| August | | | | | | | | | | | | |
| 10 | | | | | 35502 | 30663 | 23473 | 8855 | | | 10325 | 10474 |
| 15 | | | | | 38290 | 31448 | | | | | 10494 | 10520 |

1954 sealing ended 27 July
1955 " " 31 "
1956 " " 15 August
1957 " " 20 "
1958 " " 20 "
1959 " " 20 "

A comparison of the 1959 3-year-old male kill, St. Paul Island by round, with the average 3-year-old male kill, by round, of the preceeding four years (fig. 3) shows no difference in timing. It can be assumed that factors which influenced the small return of 3-year-old males were applicable to the entire year class and not to any particular segment of it. The 1959 3-year-old male kill was 40 percent of the average kill at the end of round one and 38 percent of the average kill at round 6, the period during which the peak usually occurs. At the same cut-off date, the end of round 7, the 1959 total was 42 percent of the average total. Such uniformity is interpreted to mean a failure of the year class. Little can be expected for the 1960 4-year-old kill.

Instructions governing the 1959 sealing operation again ended the male kill on 31 July. Except for 1956 and 1957, the end of July has been the traditional ending date for male kills. The arbitrary date has as its purpose protection of a male breeding reserve.

The killable size range for 1959 was extended from the usual 41 to 45-3/4 inches to 41 to 46-3/4 inches in length. This change reduced the recruitment of 4-year-old males into the breeding reserve during the period prior to 1 August. The killable size range for females was expressed as "as large a proportion as possible of females less than 46 inches." The 1958 operation gave proof that inadvertent killing of some males was inevitable when trying to take small females with dark vibrissae. As a result, the total male kill during August 1959 was 3,419 animals; 2,209 of these were killed on St. Paul Island and 210 were killed on St. George Island.

## Forecasts

A preliminary report, by Douglas G. Chapman, on forecasting the kill of male seals on St. Paul Island for 1959 is given in appendix A.

Consideration has been given to the value of using the number of 2- and 3-year-old males killed during one season as an indicator of the possible kill of 3- and 4-year-old males the following season. Forecasts to date, based on 2-year-old males, are apparently unreliable as they are not consistent with forecasts made later with more data.

Figures 4 and 5 depict the kill of 2- and 3-year-old males and the resulting kill the following year. Specific year classes are traced in both charts and a predicted figure is given for the 1960 3- and 4-year-old male kill. Both figures were based on data through 31 July.

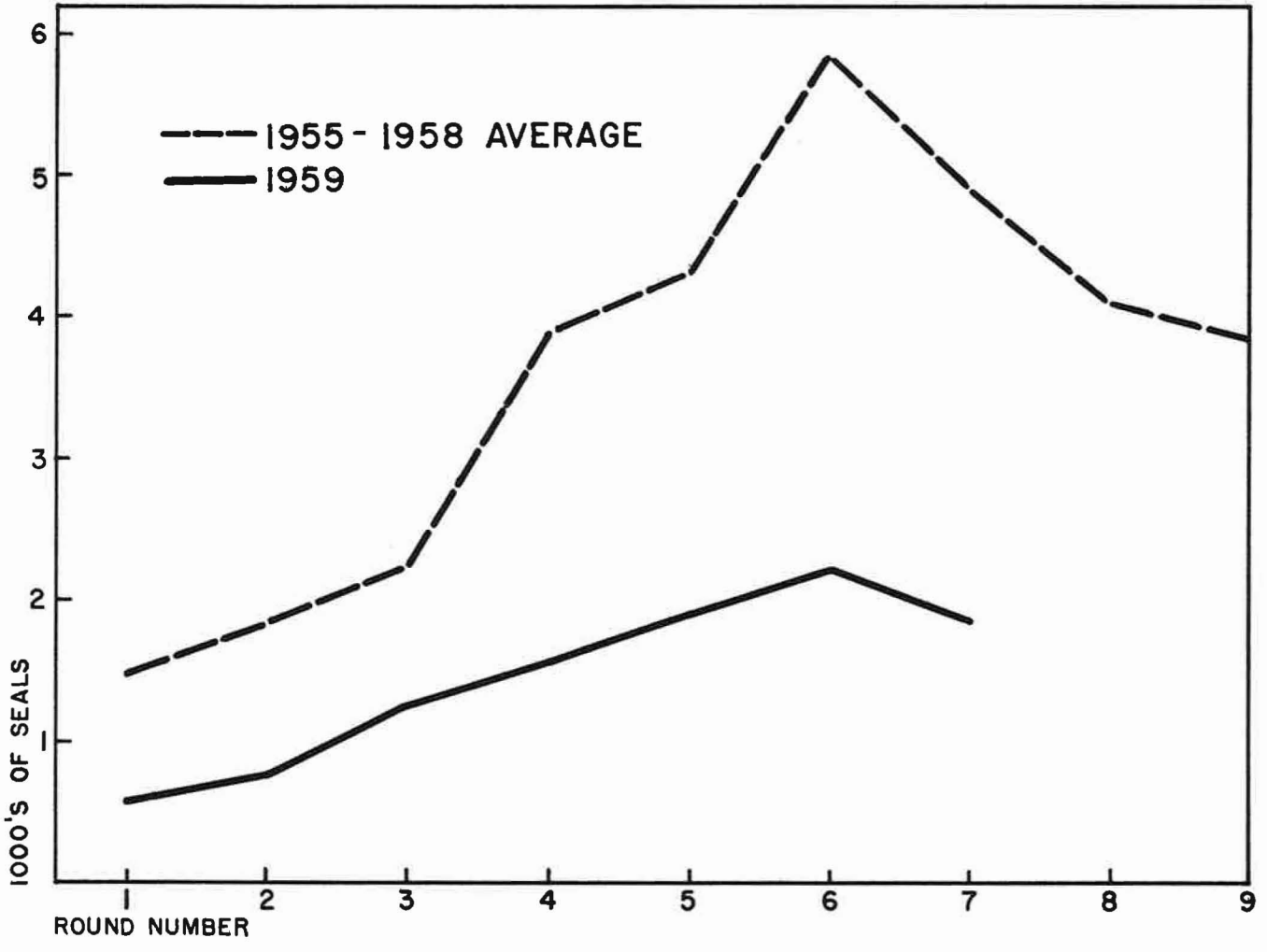


Figure 3. --St. Paul Island 3-year-old male kill, by round

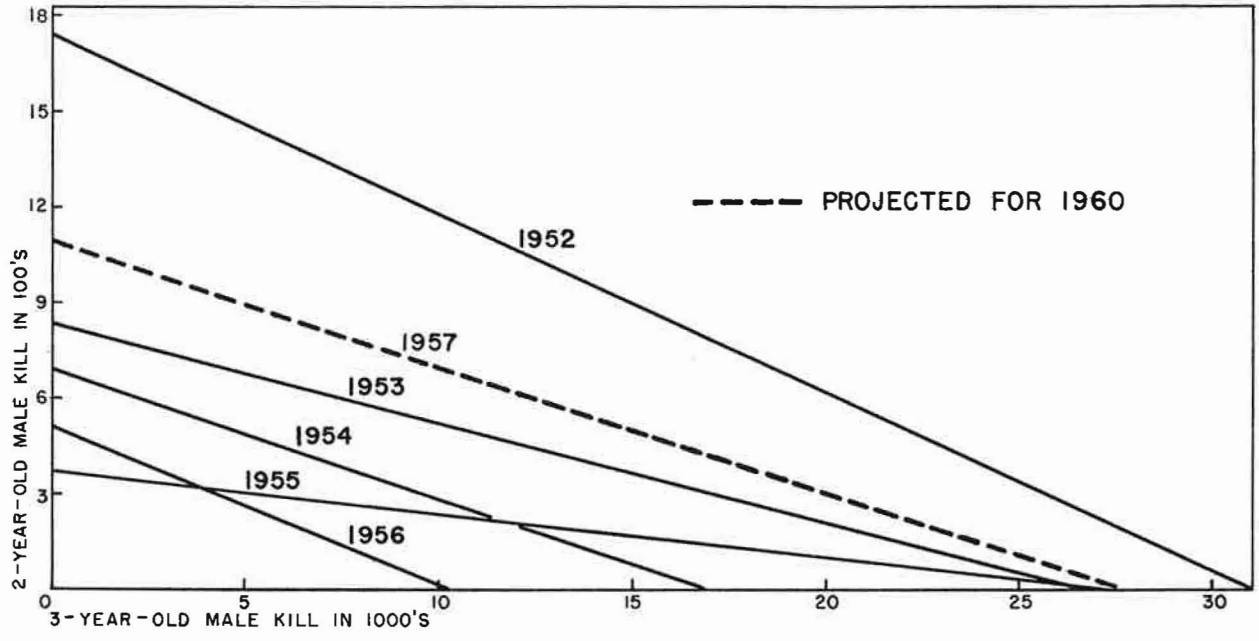


Figure 4. --St. Paul Island males, by year class, age 3, projected for 1960.

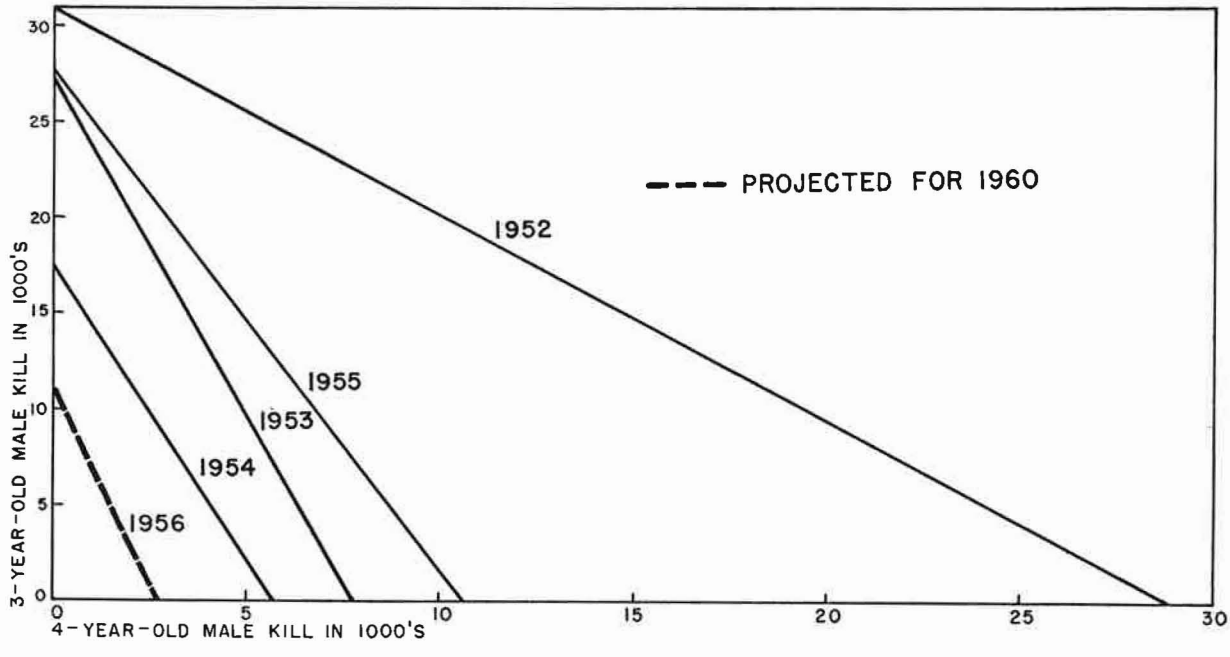


Figure 5. --St. Paul Island males, by year class, age 4, projected for 1960.

## Yearlings

More yearling males were recorded in the 1959 commercial kill than in previous years. The age of the animals was determined by reading growth ridges on teeth, since there were no tagged K-series animals in the group.

The reason for their early appearance at a size which could approach commercial standards is not clear. Evidence of a significant increase in weight of the 1958 pup crop over the 1957 pup crop was shown (1957-1958 reports) by live-pup weights taken in early September. It is not possible to state now that relatively large size in September of the year of birth would indicate early appearance and continued rapid growth. This is an aspect that will be watched closely through weights of live pups and weights of the same year class returning as 3- and 4-year-old seals.

## Bull Counts

Following two seasons' training under Mr. C. L. Olson, General Manager of the Pribilof Islands, the biological staff assumed responsibility for the bull counting in 1959. The counts were made 10-14 July on St. Paul and 15-17 July on St. George. Table 3 lists the counts by island and by rookery. All bull counts since 1910 are presented in appendix table 38.

Overall, harem bulls decreased by 1.5 percent of the 1958 count. The loss, offset in part by a slight increase on St. Paul, was sustained by St. George with a drop of 3.5 percent. However, the combined count for the two islands was still well above the 1939-1958 average of 12,025.

The idle bulls continued their sharp rate of increase with a gain of 13 percent over 1958. St. Paul idle bulls rose 21 percent while St. George experienced a loss of 11 percent. The 20-year average for this element of the herd is 5,774.

It is not yet understood how many idle bulls are needed for replacement. According to the best available evidence, relatively few harem bulls are replaced or displaced during the organized breeding season. Presumably, their most important function is to breed females arriving after the harem organization is dissolved. Also, they replace those harem bulls that have died between seasons or those

Table 3.--Harem and idle bull count, by rookery, Pribilof Islands, 1959

| Date | Rookery | Bulls | | Total |
|---|---|---|---|---|
| | | harem | idle | |
| St. Paul Island | | | | |
| 10 July | Gorbatch | 856 | 824 | 1,680 |
| | Ardiguen | 119 | 50 | 169 |
| | Reef | 1,663 | 1,512 | 3,175 |
| | Total | 2,638 | 2,386 | 5,024 |
| 11 July | Polovina | 331 | 932 | 1,263 |
| | Polovina Cliffs | 740 | 655 | 1,395 |
| | Little Polovina | 291 | 593 | 884 |
| | Total | 1,362 | 2,180 | 3,542 |
| 12 July | Morjovi | 791 | 1,466 | 2,257 |
| | Vostochni | 1,568 | 1,793 | 3,361 |
| | Total | 2,359 | 3,259 | 5,618 |
| 13 July | Tolstoi | 973 | 895 | 1,868 |
| | Lukanin | 219 | 256 | 475 |
| | Kitovi | 600 | 385 | 985 |
| | Total | 1,792 | 1,536 | 3,328 |
| 14 July | Zapadni | 1,011 | 1,340 | 2,351 |
| | Little Zapadni | 583 | 459 | 1,042 |
| | Zapadni Reef | 258 | 325 | 583 |
| | Total | 1,852 | 2,124 | 3,976 |
| | Grand total | 10,003 | 11,485 | 21,488 |
| St. George Island | | | | |
| 15 July | East Reef | 190 | 302 | 492 |
| | East Cliffs | 332 | 325 | 657 |
| | Total | 522 | 627 | 1,149 |
| 15 July | Staraya Artil | 388 | 540 | 928 |
| 16 July | North | 984 | 812 | 1,796 |
| 17 July | Zapadni | 373 | 550 | 923 |
| | South | 260 | 170 | 430 |
| | Total | 633 | 720 | 1,353 |
| | Grand total | 2,527 | 2,699 | 5,226 |
| | Both islands | 12,530 | 14,184 | 26,714 |

that are too old to take part in organized breeding. No information is available about the amount of annual attrition among harem bulls or the average span in years of harem service.

## Females

### Introduction

In 1955, when the plan for an experimental approach to manipulation of the size of the fur-seal herd to bring it to the point of maximum yield was proposed, the herd had not yet shown any marked fluctuations. It was considered then that the maximum male yield would be produced with the herd at its existing size but that the greatest over-all production would be obtained from a somewhat smaller herd and from a kill of about one-third females and two-thirds males.

In 1957 and 1959, fluctuations in productivity, which cannot be traced to any management operation, tended to strengthen the basic theory that maximum, stable, production must be obtained from a herd held at near the top of its growing stage. The kill of females is the key to bringing a population from a peak level to the growing stage and keeping it at that level.

In the four-year period, 1956 to 1959, approximately 135,000 females were killed on the Pribilof Islands. The first year, 1956, was a test year in which it was to be learned how, where, and in what numbers females could be taken on land. Two early kills of females from harems were made, then harem raiding was abandoned.

A total of 27,599 females, with a minimum size limit of 41 inches but no maximum size limit, was killed. In 1957 a total of 47,413 females of the same size limits was taken. Parts of the harem areas on Polovina, Reef, and, to a limited extent, Northeast Point were raided. Many of the large female skins were of very low quality. To avoid excessive numbers of large, unusuable skins, the instructions in 1958 required as many seals as possible to be within the size limits set for males, 41 to 45-3/4 inches. None of the 31,101 females taken in 1958 were from harems. The 21,988 genital tracts, with accompanying canine teeth for age determination, examined prior to 1959 have provided basic reproduction data. The most adequate samples are for ages 3, 4, and 5. Little year-to-year variation in pregnancy rates appeared at these ages. At older ages, the pregnancy rates vary considerably from sample to sample, depending on the source. Those

from active harems are usually more than 99 percent pregnant. The most productive age is about seven.

Females in harems are usually age 5 and older. Generally small animals are young and large animals are old (up to 26 years) according to present knowledge.

## Methods and Techniques used in Current Studies

The most useful technique for a study of the female element of the population is adequate, representative sampling. If fully representative samples of canine teeth and genital tracts were obtained, an accurate appraisal of the reproductive potential of the fur-seal herd could be made. Methods now used include random sampling of teeth and genital tracts (approaching 20 percent of the kill), age determination from teeth, field examination of genital tracts, tagging, and tag-recovery operations. In 1958, laboratory sectioning of older teeth (classified as 10+ from reading growth ridges) was adopted as a regular procedure.

## Age Classification

The major proportion of the 5,166 female samples collected on both islands was taken during the last two weeks of the 1959 sealing season. Frequency distribution of ages in the total sample was headed by age four (24 percent) followed by the collective group classified as age 10+ (18 percent). Age compositions were similar on both islands. The weakness of the 1956 year class was first noticed during the early part of the season when a normal 3-year-old male kill did not develop. The corresponding lack of 3-year-old females verified the poor survival of the year class and virtually eliminated the possibility of a sex-differential mortality. (See appendix tables 5 and 17 for female age composition.)

The sealing instructions issued for 1959 planned for a kill of 50,000 females with as many as possible to be less than 46 inches in length. The limited number of young females available, from small to low average year classes appearing as 3-, 4-, and 5-year-old animals, resulted in a kill with an age composition differing from 1958 even though sealing instructions were very similar. In 1958, females in ages 2 through 5 made up 81 percent of the total female kill on St. Paul Island and 60 percent on St. George Island. The 1959 female kill on St. Paul Island was composed of 46 percent, ages 2 through 5, and

on St. George Island, these ages made up 40 percent of the total kill. Ages 2 through 10 composed 81 percent on St. George as compared with 83 percent on St. Paul.

## Reproduction

Reproductive condition was determined from a sample of 3,984 females on St. Paul Island and 1,182 females on St. George Island. The percent of pregnant females in ages 4 and 5 increased significantly over 1958. In the remainder of the age spectrum, 6 through 10+, pregnancy rates were generally lower on St. Paul and higher on St. George than in 1958. A summary of pregnancy rates, by age, for each island shows the annual variations.

| | St. Paul Island | | | | St. George Island | | | |
|---|---|---|---|---|---|---|---|---|
| Age | 1956 | 1957 | 1958 | 1959 | 1956 | 1957 | 1958 | 1959 |
| | | | | Percent pregnant | | | | |
| 4 | 10 | 13 | 6 | 15 | 12 | 5 | 10 | 22 |
| 5 | 57 | 53 | 48 | 59 | 52 | 36 | 43 | 62 |
| 6 | 74 | 78 | 65 | 61 | 81 | 58 | 61 | 66 |
| 7 | 76 | 81 | 72 | 57 | 83 | 64 | 56 | 69 |
| 8 | 61 | 75 | 65 | 54 | 72 | 62 | 65 | 75 |
| 9 | 63 | 73 | 68 | 43 | 64 | 57 | 60 | 61 |
| 10 | 51 | 74 | 61 | 48 | 69 | 46 | 64 | 60 |
| 10+ | 36 | 51 | 35 | 39 | 53 | 51 | 45 | 51 |

The pregnancy rates for all ages have varied with each year, probably as a result of the population segment sampled, so that valid conclusions are difficult to obtain. The 1959 data agrees with previous evidence that peak reproductive capacity is reached at ages 6, 7, and 8, followed by a decline. Tables 4 and 5 summarize the reproductive condition of female samples from St. Paul Island and St. George Island, respectively.

Reproductive condition of female seals, by age and round for both islands, is shown in figures 6, 7, 8, and 9. Comparison of the reproductive condition of females, by round, for the four-year period, 1956 to 1959, indicates a general similarity between years, although the areas utilized and the proportion of females taken from hauling grounds and harems has varied.

Table 4. --Summary of reproductive condition of female seals sampled from commercial kill, by age, St. Paul Island, 1959

| Reproductive condition | Age 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nullipara | | | | | | | | | | | |
| number | 30 | 254 | 822 | 187 | 66 | 46 | 8 | 3 | 5 | 9 | 1,430 |
| percent | 100 | 99 | 84 | 34 | 15 | 10 | 3 | 2 | 3 | 1 | 36 |
| Primipara | | | | | | | | | | | |
| Pregnant | | | | | | | | | | | |
| number | - | 2 | 144 | 291 | 159 | 93 | 26 | 12 | 6 | 3 | 736 |
| percent | - | <1 | 15 | 53 | 37 | 20 | 10 | 7 | 4 | <1 | 18 |
| Nonpregnant | | | | | | | | | | | |
| number | - | - | 7 | 24 | 30 | 30 | 6 | 4 | - | 3 | 104 |
| percent | - | - | <1 | 4 | 7 | 6 | 2 | 2 | - | <1 | 3 |
| Multipara | | | | | | | | | | | |
| Pregnant | | | | | | | | | | | |
| number | - | 1 | 2 | 33 | 101 | 173 | 111 | 62 | 67 | 266 | 816 |
| percent | - | <1 | <1 | 6 | 24 | 37 | 44 | 36 | 44 | 38 | 20 |
| Nonpregnant | | | | | | | | | | | |
| number | - | - | 3 | 16 | 73 | 125 | 102 | 90 | 74 | 415 | 898 |
| percent | - | - | <1 | 3 | 17 | 27 | 41 | 53 | 49 | 60 | 23 |
| Total | 30 | 257 | 978 | 551 | 429 | 467 | 253 | 171 | 152 | 696 | 3,984 |
| Percent | 1 | 6 | 25 | 14 | 11 | 12 | 6 | 4 | 4 | 17 | |
| Percent pregnant | - | <1 | 15 | 59 | 61 | 57 | 54 | 43 | 48 | 39 | |

| All females | number | percent |
|---|---|---|
| Pregnant | 1,552 | 39 |
| Nonpregnant | 2,432 | 61 |
| Total | 3,984 | |

| Primipara and multipara females | number | percent |
|---|---|---|
| Pregnant | 1,552 | 61 |
| Nonpregnant | 1,002 | 39 |
| Total | 2,554 | |

Sample size in percent of kill: 16

Table 5. --Summary of reproductive condition of female seals sampled from commercial kill, by age, St. George Island, 1959

| Reproductive condition | Age 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nullipara | | | | | | | | | | | |
| number | 1 | 67 | 186 | 42 | 14 | 5 | 1 | - | - | 2 | 318 |
| percent | 100 | 100 | 77 | 26 | 11 | 3 | 1 | - | - | 1 | 27 |
| Primipara | | | | | | | | | | | |
| Pregnant | | | | | | | | | | | |
| number | - | - | 49 | 79 | 29 | 14 | 5 | - | 1 | 2 | 179 |
| percent | - | - | 21 | 49 | 23 | 10 | 6 | - | 2 | 1 | 15 |
| Nonpregnant | | | | | | | | | | | |
| number | - | - | 3 | 14 | 8 | 11 | 1 | - | - | - | 37 |
| percent | - | - | 1 | 9 | 7 | 7 | 1 | - | - | - | 3 |
| Multipara | | | | | | | | | | | |
| Pregnant | | | | | | | | | | | |
| number | - | - | 3 | 21 | 54 | 88 | 58 | 46 | 35 | 110 | 415 |
| percent | - | - | 1 | 13 | 43 | 60 | 69 | 61 | 58 | 50 | 35 |
| Nonpregnant | | | | | | | | | | | |
| number | - | - | - | 4 | 20 | 30 | 19 | 29 | 24 | 107 | 233 |
| percent | - | - | - | 3 | 16 | 20 | 23 | 39 | 40 | 48 | 20 |
| Total | 1 | 67 | 241 | 160 | 125 | 148 | 84 | 75 | 60 | 221 | 1,182 |
| Percent | - | 6 | 20 | 14 | 10 | 13 | 7 | 6 | 5 | 19 | |
| Percent pregnant | - | - | 22 | 62 | 66 | 69 | 75 | 61 | 60 | 51 | |

| All females | number | percent |
|---|---|---|
| Pregnant | 594 | 50 |
| Nonpregnant | 588 | 50 |
| Total | 1,182 | |

| Primipara and multipara females | number | percent |
|---|---|---|
| Pregnant | 594 | 69 |
| Nonpregnant | 270 | 31 |
| | 864 | |

Sample size in percent of kill: 33

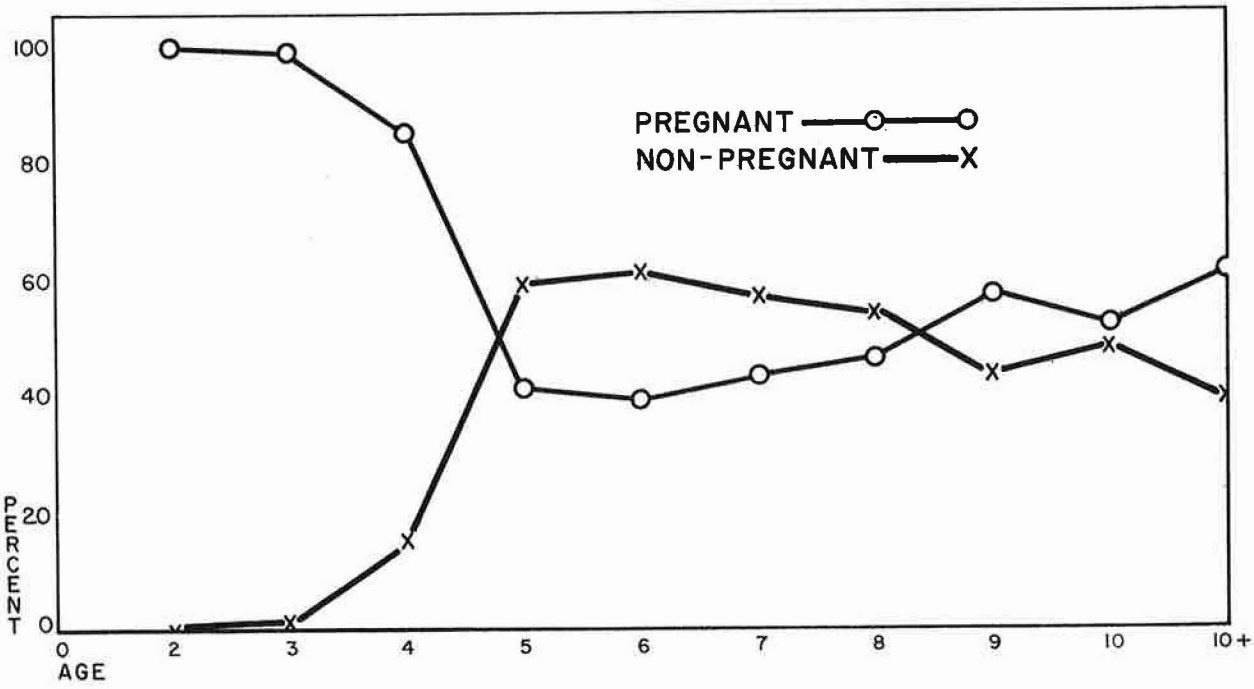


Figure 6. --Reproductive condition of female seals sampled from commercial kill, by age, St. Paul Island, 1959.

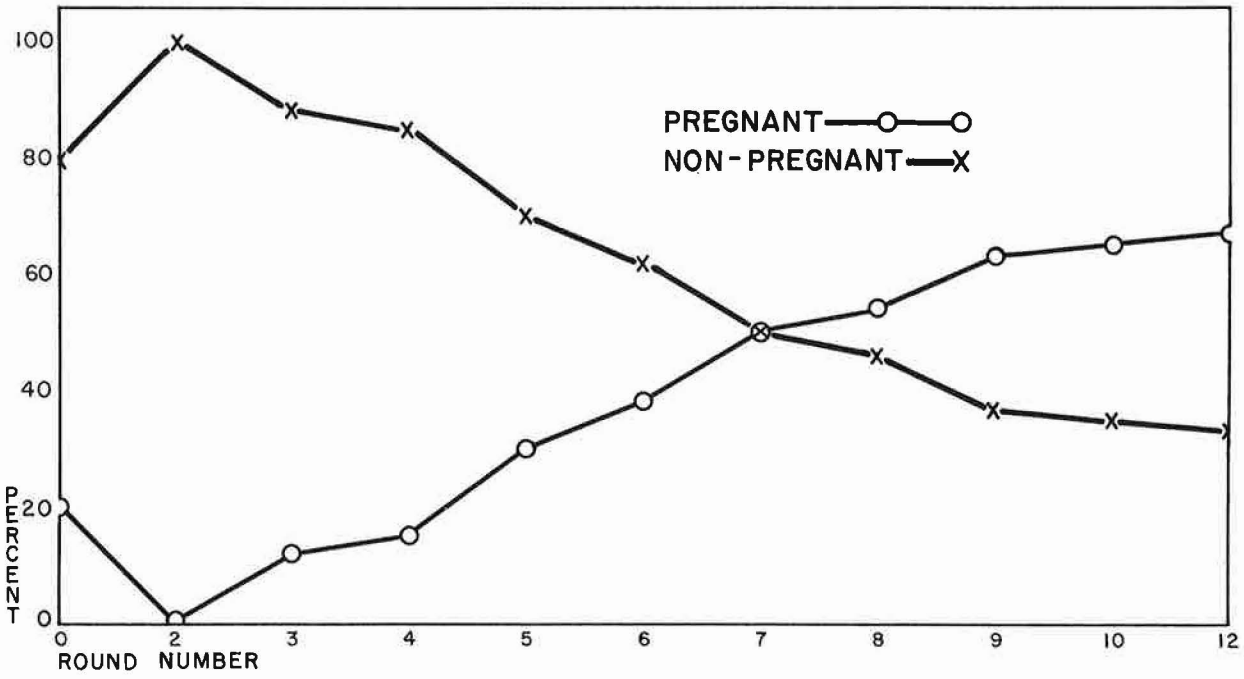


Figure 7. --Reproductive condition of female seals sampled from commercial kill, by round, St. Paul Island, 1959.

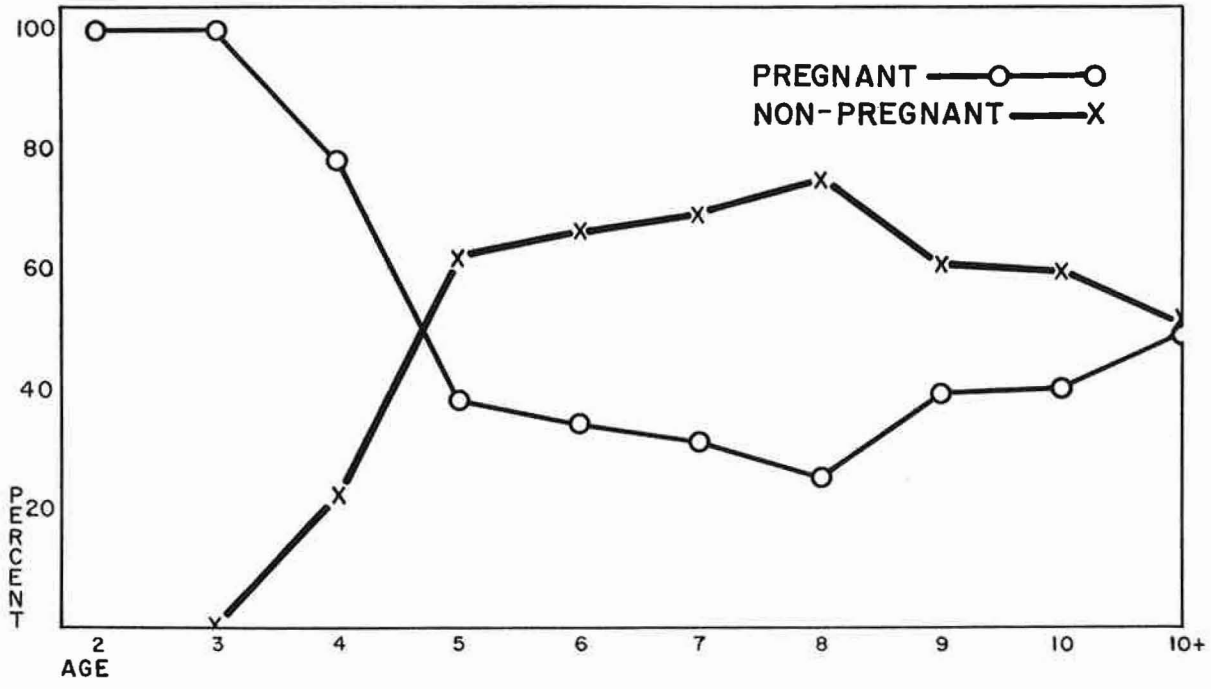


Figure 8. --Reproductive condition of female seals sampled from commercial kill, by age, St. George Island, 1959.

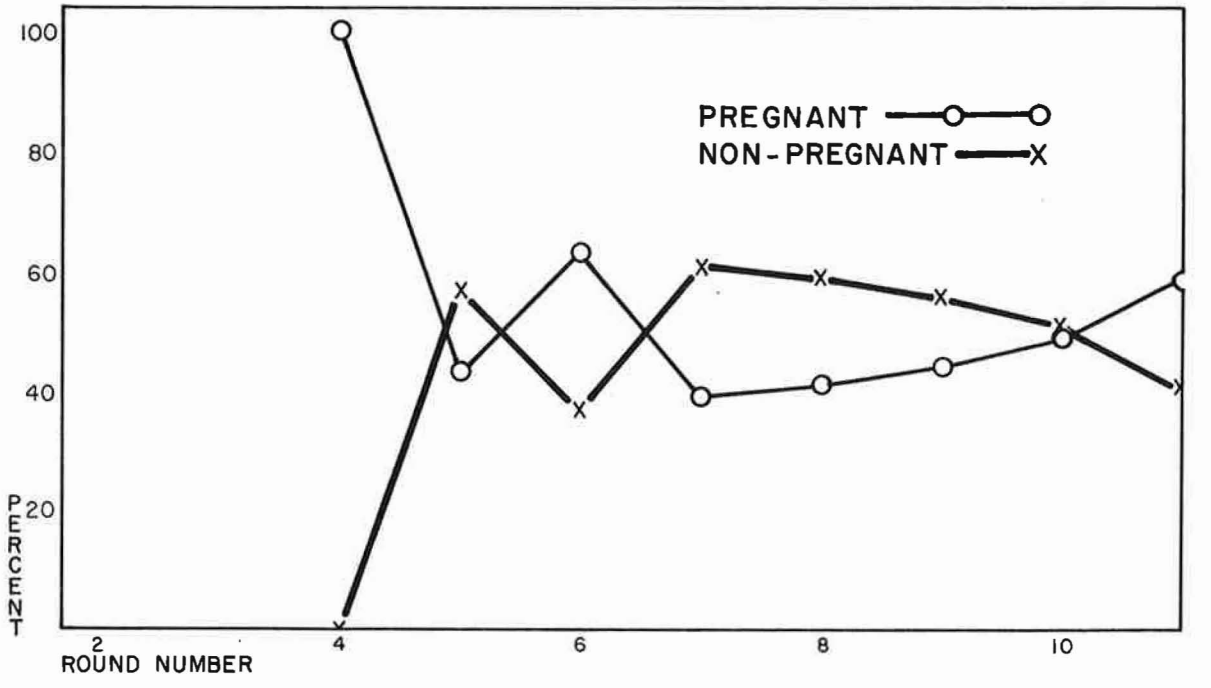


Figure 9. --Reproductive condition of female seals sampled from commercial kill, by round, St. George Island, 1959.

One 3-year-old tagged female, examined on Polovina Rookery 15 August, was judged primiparous (post partum in the right cornu). This was the first recorded instance of pregnancy in a known-age, 3-year-old female. The frequency of pregnancies in age-3 females (based on tooth-ridge analysis) has always been less than one percent.

A 4-year-old female was examined on Reef Rookery, 19 August, and showed evidence of simultaneous pregnancy in both uterine horns. The genital tract was preserved for later study and confirmation.

Eight female fur seals were collected during November and December, 1958, on St. Paul Island by Mr. Roy D. Hurd, St. Paul Island Manager, and Mr. Lavrenty Stepetin, island resident and seasonal research aid, in an effort to secure fetuses at the earliest stage of development.

Table 6 summarizes notes made by Carl E. Abegglen and Gordon C. Pike (Biological Station, Nanaimo, British Columbia, Fisheries Research Board of Canada) during gross examination of the eight genital tracts. The three fetuses found are the smallest yet obtained from the Pribilof herd. The size and collection date of the fetuses provides the best evidence, at this time, for establishing the period of blastocyst existence, or delayed implantation at three and one-half to four months, (Pearson and Enders, 1951).

## Tag Recoveries and Tagging

### Tag Recoveries

Following standard procedure of recent years, tagged animals were killed only if they were within the prescribed size limits for the kill. Ninety percent of the male tag recoveries were 3- and 4-year-olds drawn from the survivors of 50,000 males tagged as pups. In 1958, survivors of only 30,000 tagged seals were available for recovery, but the returns of tagged 3- and 4-year-old males were 62 percent greater than in 1959. Table 7 lists 1959 tag recoveries by sex, age, and island.

Table 6. --Notes on reproductive tracts of eight fur seals from St. Paul Island

| | Specimen number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Collection date (1958) | 18 Nov. | 18 Nov. | 18 Nov. | 18 Nov. | 3 Dec. | 3 Dec. | 3 Dec. | 3 Dec. |
| Location rookery | Reef | Reef | Reef | Reef | Zap. | Zap. | Zap. | Zap. |
| Age (years) | 7 | 7 | 9 | 10 | 9 | 7 | - | 8 |
| Functional horn | | | | | | | | |
| Side | R | L | L | L | R | L | L | R |
| Size of largest corpus luteum (mm.) | 13x11 | 14x12 | 14x10 | 12x11 | 15x15 | 14x12 | 10x10 | 12x12 |
| Size of largest follicle (mm.) | - | 6 | - | - | - | 4 | 2 | - |
| Number follicles (2-4 mm.) | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 |
| Follicles >4 mm. | 0 | few | 0 | 0 | 0 | few | few | 0 |
| Maximum diameter of horn (mm.) | 10 | - | - | - | - | - | 11 | - |
| Size of implantation pocket (mm.) | - | 13x18 | 6 x 4 | 10x10 | 28x22 | 45x35 | - | 25x20 |
| Blastocyst | no evidence | not found | no evidence | no evidence | - | - | no evidence | - |
| Fetus (mm.) | - | - | - | - | 10 | 25 | - | 10 |
| Corpus albicans | - | - | - | - | 1 | - | - | 1 |
| Nonfunctional horn | | | | | | | | |
| Side | L | R | R | R | L | R | R | L |
| Size of largest corpus albicans (mm.) | 8 x 4 | 14 x 6 | 10x10 | 7 x 7 | 6 x 6 | 4 x 3 | - | 10 x 8 |
| Placental scar | yes | no | yes | yes | yes | yes | yes | no |
| Maximum diameter of horn (mm.) | 14 | 11 | 14 | 14 | 11 | 11 | 12 | 11 |

Table 7. --Summary of tagged and tag-lost seals recovered by sex and age, Pribilof Islands, 1959

| Series | Age | Tagged seals St. Paul | Tagged seals St. George | Tagged seals combined total | Tag-lost seals St. Paul | Tag-lost seals St. George | Tag-lost seals combined total | Grand total |
|---|---|---|---|---|---|---|---|---|
| | | | | Male | | | | |
| J | 2 | 126 | 18 | 144 | 11 | 2 | 13 | 157 |
| I | 3 | 458 | 76 | 534 | 61 | 22 | 83 | 617 |
| H | 4 | 781 | 33 | 814 | 113 | 1 | 114 | 928 |
| G | 5 | 9 | 1 | 10 | 5 | - | 5 | 15 |
| F | 6 | 1 | - | 1 | - | - | - | 1 |
| E | 7 | 2 | - | 2 | - | - | - | 2 |
| Total | | 1,377 | 128 | 1,505 | 190 | 25 | 215 | 1,720 |
| | | | | Female | | | | |
| J | 2 | 3 | - | 3 | 4 | - | 4 | 7 |
| I | 3 | 62 | 9 | 71 | 17 | 3 | 20 | 91 |
| H | 4 | 345 | 2 | 347 | 60 | - | 60 | 407 |
| G | 5 | 59 | - | 59 | 5 | 1 | 6 | 65 |
| F | 6 | 30 | 1 | 31 | 16 | - | 16 | 47 |
| E | 7 | 108 | - | 108 | 13 | - | 13 | 121 |
| D | 8 | 6 | - | 6 | - | - | - | 6 |
| CS | 10 | 29 | 1 | 30 | - | - | - | 30 |
| B | 11 | 29 | - | 29 | - | - | - | 29 |
| A | 12 | 5 | 1 | 6 | - | - | - | 6 |
| Total | | 676 | 14 | 690 | 115 | 4 | 119 | 809 |

## Tagging-1959

For the fifth consecutive year 50,000 pups were tagged on the Pribilof Islands. Twenty percent, or 10,000, of the tags were attached to pups on St. George Island. This is the fourth successive year of tagging on St. George Island. The remaining 40,000 were used on St. Paul Island. Following usual procedure, tags were allotted to each rookery according to the proportion of harem bulls counted on that rookery. A list of tagging locations and number of pups tagged at each is given in table 8.

All tags used in 1959 were of monel metal (style 19 M, National Band and Tag Company, Newport, Kentucky, 0.9 x 9.5 x 101 mm. before folding) and had the series designation "L" stamped ahead of the number. The series designation and number were stamped on the clinch side of

Table 8. --Seal tagging on the Pribilof Islands, 1959

| Date | Rookery | Percent | Number and series allotment | Tags spoiled | Number seals tagged |
|---|---|---|---|---|---|
| August | | | St. Paul Island | | |
| 24 & 25 | Reef | 26.4 | 10,600<br>L 17401-28000 | 17 | 10,583 |
| 27 | Polovina | 10.7 | 4,300<br>L 28001-32300 | 5 | 4,295 |
| 27 | Little Polovina | 2.9 | 1,200<br>L 32301-33500 | 4 | 1,196 |
| 26 | Northeast Point | 23.6 | 9,500<br>L 33501-43000 | 19 | 9,481 |
| 23 | Tolstoi | 9.7 | 3,800<br>L 43001-46800 | 11 | 3,789 |
| 25 | Lukanin-Kitovi | 8.2 | 3,200<br>L 46801-50000 | 12 | 3,188 |
| 22 | Zapadni | 10.1 | 4,000<br>L 10001-14000 | 21 | 3,979 |
| 22 & 23 | Zapadni Reef & Little Zapadni | | 3,400<br>L 14001-17400 | 10 | 3,390 |
| | Total | | | 99 | 39,901 |
| | | | St. George Island | | |
| 22 | Zapadni | 22.0 | 2,200<br>L 1 - 2,200 | 10 | 2,190 |
| 24 & 25 | North | 40.0 | 4,000<br>L 6001-10000 | 8 | 3,992 |
| 23 | Staraya | 16.0 | 1,600<br>L 2201-3800 | 2 | 1,598 |
| 24 | East | 22.0 | 2,200<br>L 3801-6000 | 0 | 2,200 |
| | Total | | | 20 | 9,980 |
| | Grand total | | | 119 | 49,881 |

the tag, which is uppermost when in place on the pup. This permits a visual check of the clinch by the operator and prevents excessive wear of identifying letters and numbers. The lettering (Notify F. & W. Service, Washington, D. C.) was stamped inside the tag, providing protection from wear (fig. 10). Tags applied in 1959 were attached to the rear edge of the left foreflipper where the fur meets the bare black skin. To permit identification of individuals that have lost their tags, 1/2 inch to 3/4 inch of the tip of the same flipper was cut off (fig. 11).


Figure 10. --Tag used in fur-seal tagging program showing lettering in relation to clinch side of tag (clinched length: 42 mm.).

Tagging began 22 August on both islands and was completed 28 August on St. Paul Island and 25 August on St. George Island. A record of fur-seal pups tagged on the Pribilof Islands is given in appendix table 39.

## Appraisal of Problems Involved in Tagging and Tag Recoveries

The marking and recovery of seals as a means of making reliable population estimates present problems, some of which are difficult to evaluate. Following is an appraisal of the problems involved in tagging and tag recovery. Effects stemming from these problems may or may not be sufficient to bias population estimates.

Mortality differential between sexes. --Among most mammal populations, males slightly outnumber females at birth and the life span of the female is generally extended beyond that of the male. Population

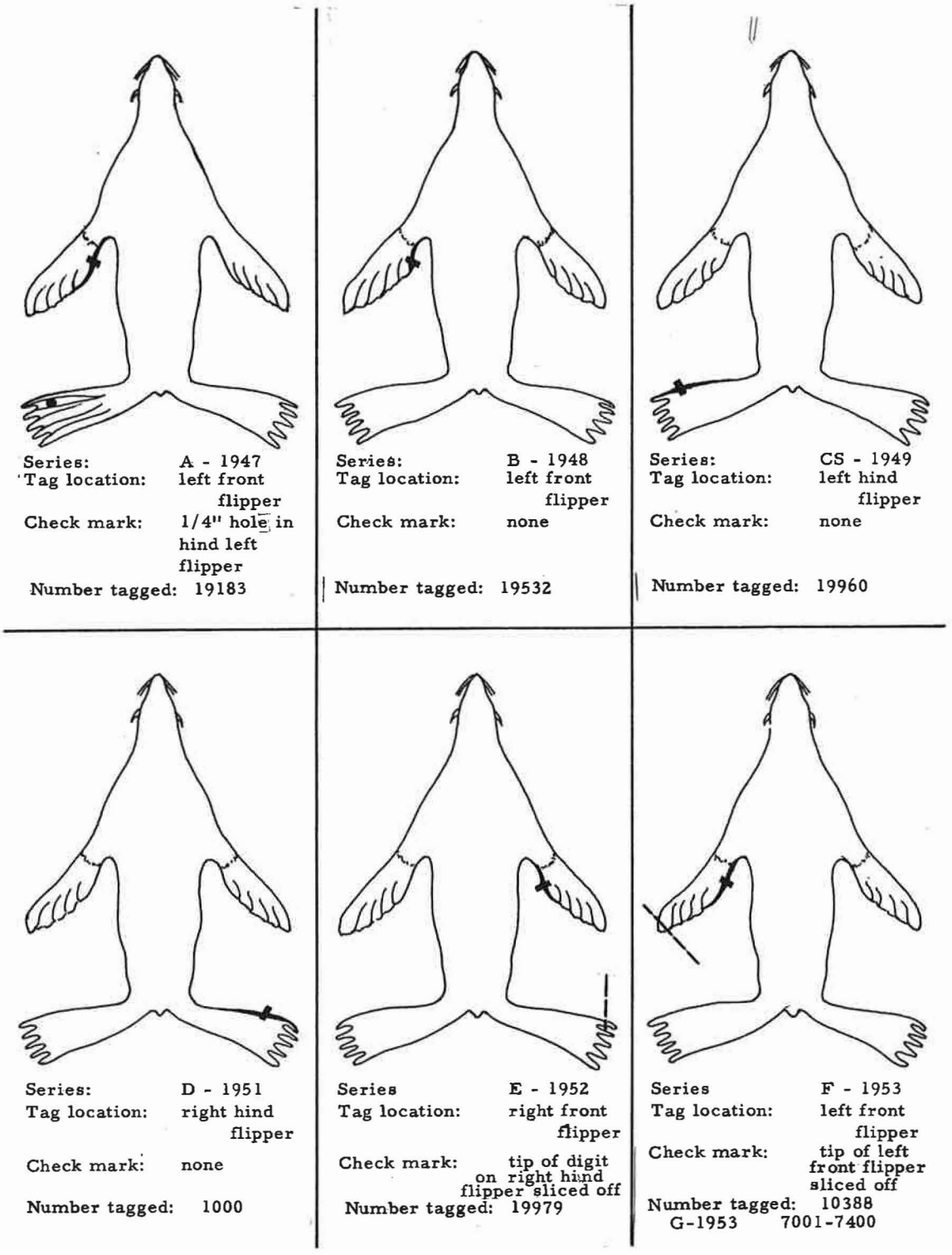


Figure 11. -- Tag and check-mark locations, fur-seal pup tagging, Pribilof Islands, 1947-1959.

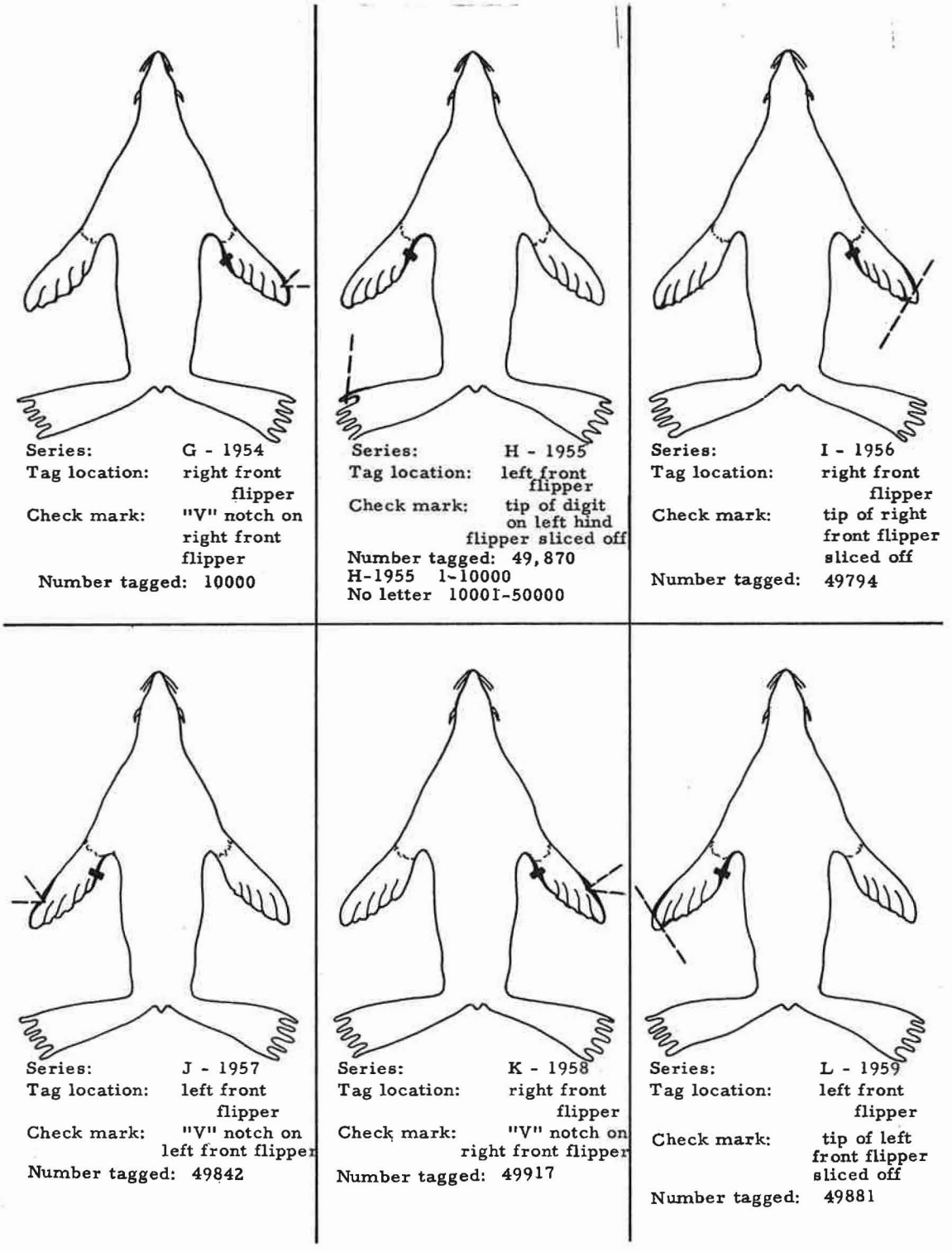


Figure 11. -- Tag and check-mark locations, fur-seal pup tagging, Pribilof Islands, 1947-1959 (con.).

estimates, based upon tag returns, could thus be distorted should these factors exist in significant proportion. No clear evidence of differential mortality at any stage in the life of fur seals is yet available.

Quality of tags. --This factor can probably be eliminated. Tags have been furnished by the same manufacturer for many years. The size, design, and type of metal have been standardized to give optimum service. No basic structural defects in the tags are known.

Application of tags. --Tags have been attached to front flippers since 1952. Experience in the tagging of fur seals has shown that location to be most suitable for recovery and for avoiding injury to the seals. However, to insure adequate clinching, minimum tag loss and abrasion, and reduce possible loss of animals through festered wounds, tags should be precisely attached 1/2 inch to 3/4 inch forward of the rear edge of the flipper in the fur near the juncture of furred and bare skin. During the rather high-speed tagging operation, this is not always true of each tag attachment.

Application of check marks. --Size of the check mark diminishes with growth of the animal. Hence, to be most effective as a recognizable mark several years later, the check mark should cover the maximum flipper area without causing excessive bleeding and shock to the animal. There may be occasional instances of mortality from this cause.

Effects of tagging. --A small percentage of tagged pups suffer internal injuries during handling. Immediate mortality can, in part, be measured by noting dead tagged pups during the annual count of dead pups. Any long delayed mortality cannot be measured since much of it may occur after the pups have left the islands.

Tag recoveries. --During high-speed killing operations on St. Paul Island, it is possible that some tags or check marks are missed, caused mostly by unnecessary forward pressure of that segment of the sealing crew following the clubbers. As it has been stated in previous reports, one or two rows of seals should intervene at all times between the slitters and the row on which the tallyman and biologists are working. Safety would also result from this modification of the normal routine.

Because of the slower pace on St. George Island, tag recovery can be more thorough than on St. Paul Island.

To summarize, a mortality differential between sexes can produce estimates that are either too high or too low, depending on the sex from which tags are recovered. Marks missed during the recovery

operation and mortality as a result of marking would both produce population estimates that are too high.

## Homing Tendency

Homing tendency of tagged male and female seals is shown in table 9 by rookery, and in table 10 by age. Reasons for sexual differences in homing tendency have been explained in previous reports (1956, 1957 and 1958).

In 1959, homing tendency of the males was not much different from that of tagged males harvested during the previous three years. Preliminary analysis of homing tendency among females, however, suggests a definite downward trend from 1956, and a steady "within-season" increase in straying by 5-day rounds. Neither of these conditions is apparent in the males.

Table 9. --Homing tendency of male and female seals, by rookery, St. Paul Island, 1959

| Rookery of tagging | Males | | | Females | | |
|---|---|---|---|---|---|---|
| | Total recoveries | Recovered home rookery number | percent | Total recoveries | Recovered home rookery number | percent |
| NEP | 271 | 189 | 70 | 154 | 133 | 86 |
| TOL | 171 | 33 | 19 | 62 | 29 | 47 |
| L-K | 76 | 23 | 30 | 19 | - | - |
| ZAP | 264 | 178 | 67 | 95 | 67 | 70 |
| REEF | 401 | 67 | 17 | 148 | 65 | 44 |
| POL | 212 | 132 | 62 | 203 | 154 | 76 |
| | | | Mean | | | Mean |
| Total | 1,395 | 622 | 44 | 681 | 448 | 66 |

Table 10.--Homing tendency of male and female seals, by age, Pribilof Islands, 1959

| Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|
| | | Recovered home rookery | | | | Recovered home rookery | |
| Age | Total recoveries | number | percent | Age | Total recoveries | number | percent |
| 2 | 144 | 60 | 42 | 2 | 3 | 3 | 100 |
| 3 | 534 | 210 | 39 | 3 | 71 | 37 | 52 |
| 4 | 814 | 388 | 48 | 4 | 347 | 235 | 68 |
| 5 | 10 | 5 | 50 | 5 | 59 | 30 | 51 |
| 6 | 1 | - | - | 6 | 31 | 22 | 71 |
| 7 | 2 | 2 | 100 | 7 | 108 | 75 | 69 |
| | | | | 8 | 6 | 5 | 83 |
| | | | | 9 | No tagging in 1950 | | |
| | | | | 10 | 30 | 24 | 80 |
| | | | | 11 | 29 | 19 | 66 |
| | | | | 12 | 6 | 3 | 50 |

## MORTALITY

### Background

Mortality from hookworm accounted for about 55 percent of all pup deaths in 1951 (Doyle, 1957). The proportion attributable to hookworm is probably higher most years when few females are removed from harem areas. The die-off, as has been frequently reported previously, reaches a peak in early August and usually drops rapidly between 10 and 15 August. When only males were killed commercially, pup mortality could generally be measured shortly after mid-August. However, since 1956 the commercial kill has included females. A proportion of the female kill for 1956 and 1957 came from established harems, and pups belonging to those females were destined to starve. Because of the time required for starvation in animals that feed intermittently, as fur-seal pups do, it is estimated that mortality continues for at least three weeks after the last killing. Dead pup counts are further complicated by carcass disappearance when counts have been delayed to include mortality from starvation. In 1958 and in 1959, the killing of harem females was generally avoided, thus eliminating any significant die-off following the dead-pup counts.

Whenever counts were made, pup mortality was found to be increasing from 1941 to 1956 (appendix table 4). Losses declined in the years 1957 to 1959. Research workers believe the fluctuating mortality is a manifestation of a peak population. Available evidence (appendix B) indicates that mortality is density dependent. Whether this is completely true of hookworm-caused mortality is not clear. Weather conditions, and perhaps factors not now known may influence the life cycle of hookworms, and allow hookworm-caused mortality to vary in part, independently of population pressure.

## Dead-pup Counts

### Total Counts

Pup mortality was greater in 1959 than in 1958 but was at a low level in comparison with the counts made in 1956 and 1957. As in 1958, there was little evidence of high mortality along the beaches or on harem fringes until mid-August. Severe rains, which cause a sudden increase in deaths of sick animals through chilling, occurred on both islands during the latter half of August. On St. Paul Island, 39,964 dead pups were found. The count on St. George was 6,937. The total dead-pup counts for both islands are listed by rookery in table 11.

### Sample-area Counts, St. Paul Island

As in three previous years, dead-pup counts on established sample areas were made in conjunction with the total dead-pup counts (table 12). The results are in close agreement with the percentages of previous years.

| Year | 1956 | 1957 | 1958 | 1959 |
|---|---|---|---|---|
| Percent | 32.0 | 32.5 | 37.8 | 34.3 |

Sample-area counts can now be considered a reliable mortality indicator and could be used alone if necessary. In view of the possible use of the counts as indicators of future kills, the extra time needed to make complete rookery counts is well spent. A comparison of the percent of the total rookery count represented by sample-area counts for 1956 to 1959 is shown in table 13.

Table 11. -- Dead pup counts, Pribilof Islands, Alaska, 1959

| Rookery | 1959 |
|---|---|
| St. Paul Island | |
| Northeast Point | |
| Morjovi | 4,560 |
| Vostochni | 7,105 |
| Polovina | |
| Little Polovina | 1,597 |
| Polovina Cliffs | 2,586 |
| Polovina | 3,311 |
| Reef | |
| Ardiguen | 141 |
| Gorbatch | 2,100 |
| Reef | 6,052 |
| Sivutch | --- |
| Kitovi, Lukanin, Tolstoi | |
| Kitovi | 882 |
| Lukanin | 631 |
| Tolstoi | 3,691 |
| Zapadni | |
| Little Zapadni | 1,691 |
| Zapadni Reef | 608 |
| Zapadni | 5,009 |
| Actual total | 39,964 |
| Add 5 percent | 1,998 |
| Estimated total | 41,962 |
| St. George Island | |
| North | 2,653 |
| Zapadni | 1,633 |
| East | 664 |
| Staraya | 1,987 |
| Actual total | 6,937 |
| Add 5 percent | 347 |
| Estimated total | 7,284 |
| Summary - 1959 | |
| Pribilof Islands | 46,901 |
| Add 5 percent | 2,345 |
| Estimated total | 49,246 |

Table 12. --Dead pup counts, study areas, St. Paul Island, 1959

| Rookery | Number |
|---|---|
| Northeast Point Rookeries | |
| Morjovi | 1,405 |
| Vostochni | 2,059 |
| Polovina Rookeries | |
| Little Polovina | 894 |
| Polovina | 2,496 |
| Reef Rookeries | |
| Gorbatch | 810 |
| Reef area 1 (north) | 776 |
| Reef area 2 (south) | 1,103 |
| Kitovi, Lukanin, Tolstoi Rookeries | |
| Tolstoi | 1,657 |
| Zapadni Rookeries | |
| Little Zapadni | 535 |
| Zapadni | 2,390 |
| Total | ~~13,725~~ 14,125 |

Table 13. --Percent of complete rookery dead pup counts represented by study area counts

| Rookery | 1956 | 1957 | 1958 | 1959 |
|---|---|---|---|---|
| | | Percent | | |
| Morjovi | 42.0 | 33.1 | 29.8 | 30.8 |
| Vostochni | 20.6 | 25.1 | 14.4 | 29.0 |
| Little Polovina | 51.6 | 55.5 | 61.3 | 56.0 |
| Polovina | 26.3 | 36.6 | 48.5 | 42.3 |
| Gorbatch | 33.1 | 31.0 | 68.8 | 38.6 |
| Reef | 30.2 | 25.6 | 46.3 | 31.0 |
| Tolstoi | 52.3 | 43.8 | 48.4 | 44.9 |
| Little Zapadni | 39.2 | 28.3 | 30.0 | 31.6 |
| Zapadni | 51.3 | 52.2 | 50.9 | 47.7 |

## Recent Mortality Trends

Total dead-pup counts recorded through 1957 gave the impression that pup mortality was fluctuating between 75,000 and 125,000 annually. The count in 1958, which was significantly lower than the

minimum estimate of 75,000, made necessary a change in the statement. This change was not one of basic principle, as fluctuations in mortality will continue, but in the estimate of the range of fluctuation.

## Factors Affecting Mortality

### Weather

A study was started in 1958 to determine, if possible, the relative effects of weather on pup mortality. This broad approach was narrowed by limiting the period to that when pups are on land. Early attempts were unproductive in getting direct correlations between pup mortality and the weather conditions which prevailed at the time pups were on land. In the period preceding pup births a precise inverse correlation was found between pup mortality and temperature for the period 1950 to 1957. Application of the method to 1958 and 1959 mortality figures showed little, if any, correlation. An inverse correlation (fig. 12) again resulted when departures from long-term means of monthly air temperatures were applied to mortality figures. The following is a postulation of the relationship between temperature and pup mortality. High mean temperatures may accelerate development of the hookworm larvae and thereby cause peak abundance of the larval form, in its infectious stage, to exist before many pups are born. Colder mean temperatures, however, may be inhibitive, so that larval development might be delayed enough to coincide with the time when most seal pups are available. This would obviously result in a higher pup mortality. Another interpretation would associate low pup mortality with peak abundance of infectious-stage larva prior to the period of maximum susceptibility of pups. High mortality would occur when temperature-delayed development of the infectious larval form coincided with the time when pups are most susceptible to hookworm infection.

### Other Factors

The effect of disease, other than parasitism, on the pup survival of any given year is unknown. Examination of 1,727 pups in 1957 (Doyle, 1958) did not reveal any diseases that were more than minor causes of mortality. Peritonitis and pneumonia infections caused a small number of deaths.

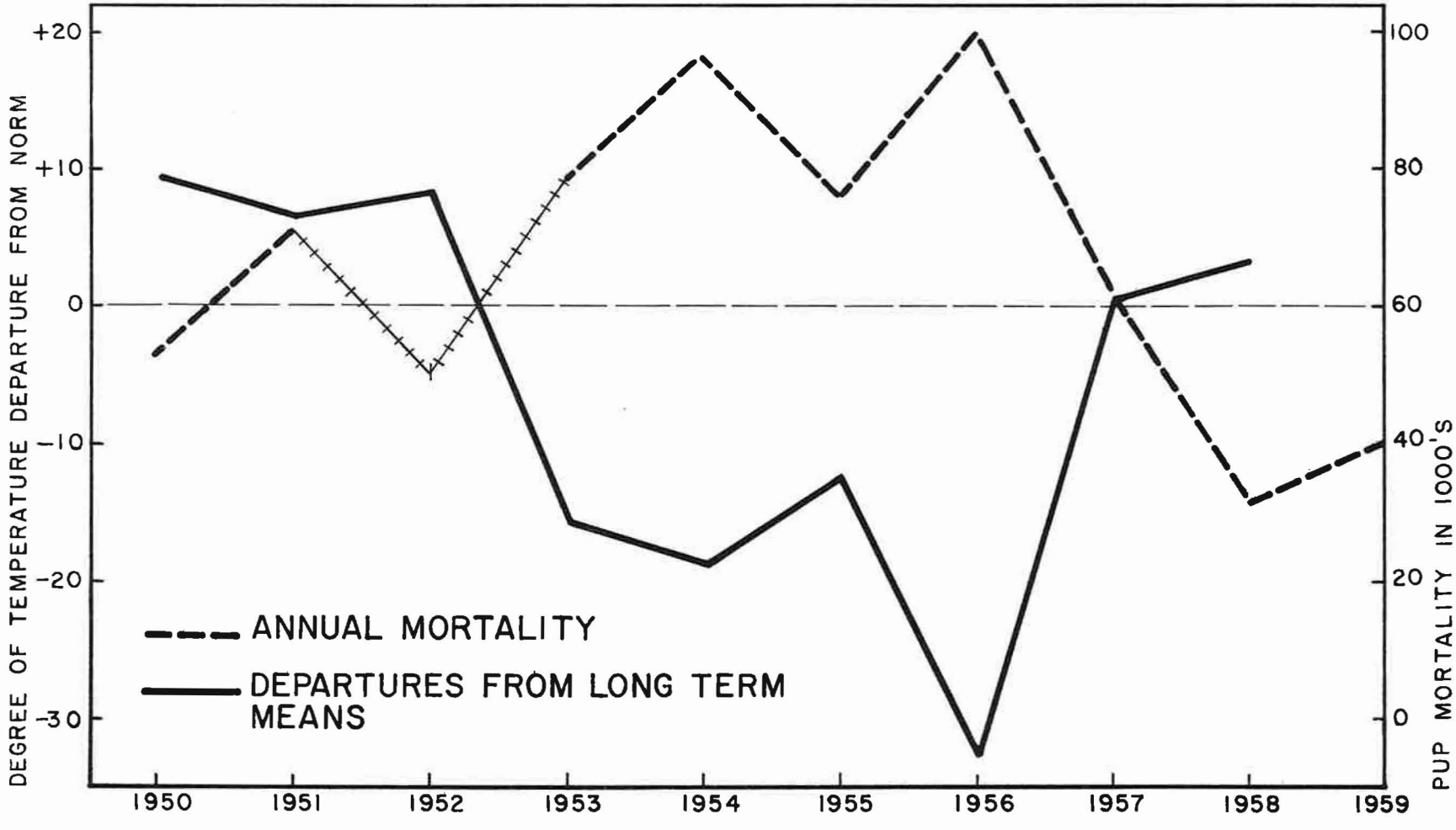


Figure 12. --Pup mortality-temperature relationship, 1950-1959.

Chapman (Appendix A) has found, tentatively, that the proportion of bachelors returning bears an inverse relationship to year-class size. Table 14, in the years 1953 to 1956, shows a direct relationship between the return of bachelors and pup mortality on land. Since land-pup mortality is not sufficiently large to reduce a year class to the number returning at age 3, it follows that: (1) in years of high land mortality, a severe loss takes place after the pups depart from the islands because they are relatively small and weak; (2) if the mortality is density dependent, food may be an important factor determining survival.

Almost nothing is known about ocean mortality except for the relationships mentioned above and the fact that dead seals, predominantly pups[1/], drift in on the Pacific Coast beaches.

## RELATED STUDIES

### Seal-pup Weights

#### Objective

The third of a series of live seal-pup weights was taken on St. Paul Island in 1959. These data are being collected to provide a condition factor that may be related to survival. Mean weight changes in pups from year to year may show some correlation with the numbers of an age class harvested three and four years later. A sample of weights of tagged 3-year-old males and females will be taken each season beginning in 1960 to check for weight changes by year, and to determine if a correlation exists between mean pup weights and mean weights of the same year class as adults of various ages.

#### Procedure

Each year 300 pups are weighed at Northeast Point, Polovina, Zapadni Reef, and Reef rookeries. It is important that the weighing be done as close as possible to the same date each year. Weighing dates in 1957 were 30 and 31 August and in 1958 and 1959, 1 and 2 September.

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1/ Called yearlings after 1 January.

Table 14. --St. Paul Island counted seal-pup mortality with male kill of 3 and 4 years later

| Year | Dead pups | Total male seals taken 3 years later | 3-year-old seals taken from year class | 4-year-old seals taken from year class | Total 3- and 4-year-old seals taken from year class |
|---|---|---|---|---|---|
| 1896 | 10,309[1] | 102,617[1] | - | - | - |
| 1908 | 3,003 | 12,466[2] | - | - | - |
| 1909 | 3,786 | 11,053[3] | - | - | - |
| 1912 | Search in late October | - | none found | | |
| 1914 | 1,523 | 4,986 | - | - | - |
| 1915 | 1,607 | 27,503 | - | - | - |
| 1916 | 2,170 | 24,053 | - | - | - |
| 1917 | 3,437 | 22,220 | - | - | - |
| 1918 | 3,873 | 19,230 | - | - | - |
| 1919 | 4,298 | 26,035 | - | - | - |
| 1920 | 3,720 | 12,841 | - | - | - |
| 1921 | 3,840 | 13,453 | - | - | - |
| 1922 | 2,755 | 15,082 | - | - | - |
| 1923 | not counted | 16,231 | - | - | - |
| 1924 | 4,354 | 19,000 | - | - | - |
| 1925 | not counted | 23,003 | - | - | - |
| 1926 | " | 33,216 | - | - | - |
| 1927-40 | " | - | - | - | - |
| 1941 | 19,000 | 39,846 | - | - | - |
| 1942-49 | not counted | - | - | - | - |
| 1950 | 54,520 | | 40,600[4] | 15,365 | 55,965 |
| 1951 | 74,196 | | 32,349 | 18,083 | 50,432 |
| 1952 | not counted | | - | - | - |
| 1953 | 83,173 | | 38,290 | 8,855 | 47,145 |
| 1954 | 100,978 | | 23,473 | 5,599 | 29,072 |
| 1955 | 75,544 | | 27,912 | 10,547 | 38,459 |
| 1956 | 103,642 | | 10,537 | | |
| 1957 | 64,745 | | | | |
| 1958 | 32,746 | | | | |
| 1959 | 41,962 | | | | |

[1] 28,858 seals taken at sea in addition to St. George Island kill.

[2] Pelagic take of 18,105 seals recorded in addition to St. George Island.

[3] Pelagic take of 14,139 seals recorded in addition to St. George Island kill.

[4] First year in which age classification, corresponding with dead-pup counts were available.

Burlap bags, with steel hoops to keep the top open, were used to hold the pups. The bag, hoop, and pup were then weighed in a cradle mounted on a platform scale, the weight of bag, hoop, and cradle tared off the dial. Weight, to the nearest two-tenths (2/10) of a kilogram, sex, location, time, and tag number (if tagged) were recorded for each pup weighed.

## Results

The 1959 sample was made up of 52 percent males and 48 percent females. Thirty-one percent of all pups weighed were tagged and 49 percent of the tagged pups were males. The heaviest pup in the sample was a tagged male from Zapadni Reef Rookery, weighing 16.0 kilograms, and the lightest an untagged female from Northeast Point Rookery, weighing 4.0 kilograms. Table 15 lists mean weights, by rookery and sex, for tagged and untagged pups.

There was a decrease from 1958 in the mean weight of pups on the one comparable rookery, Northeast Point, where males averaged 11.4 kilograms in 1958 and 8.8 kilograms in 1959. Table 16 shows the average weights of pups weighed since 1957.

Table 15.--Seal-pup weights, St. Paul Island, 1959

| Rookery | Number | | Percent | |
|---|---|---|---|---|
| | male | female | male | female |
| All pups | | | | |
| NEP | 147 | 152 | 8.8 | 7.8 |
| POL | 158 | 142 | 9.2 | 8.1 |
| ZAP-REEF | 152 | 148 | 9.2 | 7.9 |
| REEF | 168 | 132 | 9.8 | 8.5 |
| Total | 626 | 574 | 9.3 | 8.1 |
| Tagged pups | | | | |
| NEP | 52 | 50 | 8.6 | 7.8 |
| POL | 44 | 46 | 9.0 | 8.3 |
| ZAP-REEF | 25 | 30 | 8.6 | 7.3 |
| REEF | 61 | 62 | 9.5 | 8.4 |
| Total | 182 | 188 | 9.0 | 8.0 |

Table 16. --Seal-pup weights, 1957, 1958, and 1959

| Group | Sample size | | | Mean weight (kg.) | | |
|---|---|---|---|---|---|---|
| | 1957 | 1958 | 1959 | 1957 | 1958 | 1959 |
| Males | | | | | | |
| tagged | 262 | - | 182 | 7.9 | - | 9.0 |
| untagged | 391 | - | 444 | 8.7 | - | 9.4 |
| combined | 653 | 127 | 626 | 8.4 | 11.4 | 9.3 |
| Females | | | | | | |
| tagged | 196 | - | 188 | 7.4 | - | 8.0 |
| untagged | 351 | - | 386 | 7.7 | - | 8.1 |
| combined | 547 | 121 | 574 | 7.6 | 9.9 | 8.1 |
| Males and females | | | | | | |
| tagged | 458 | - | 370 | 7.7 | - | 8.5 |
| untagged | 742 | - | 830 | 8.2 | - | 8.8 |
| combined | 1200 | 248 | 1200 | 8.0 | 10.7 | 8.7 |

## Live-pup Counts

In a new attempt to obtain comparative data on the relative abundance of seal pups from year-to-year more quickly than this information can be developed from tag recoveries, the proposal has been made to count pups on sample areas. Such areas should have definite geographic boundaries and be completely visible from a small number of vantage points.

Toward this end, live pup counts were made on two St. Paul Island rookeries on 5 August 1959. Kitovi and Tolstoi Rookeries were selected because of the height advantage offered and the disruptive factor of walking through a rookery would be eliminated.

All live pups in the Kitovi Amphitheater were counted. (The count was made from the observation blind to hillside marker "15", in addition to that portion of Kitovi Rookery extending from the observation blind to hillside marker "13.") The count obtained for Kitovi Amphitheater was 1,218, and for the rest of the sample area 929, making a total of 2,147 live pups.

On an area on Tolstoi Rookery beach, approximately 50 yards in depth (between two perpendicular lines to the shore line, set off by hillside markers "16" and the white cross marker west of the last catwalk) 702 live pups were recorded.

## Hookworm Studies

The contract with Colorado State University to study the life cycle of the hookworm parasite of fur seals became effective on 26 June 1959. The purpose of the study is to clarify the basic aspects of infection such as, mode of attack, primary and secondary sources of pathology, development of immunity, and ecological factors influencing the free-living phases of the parasite. The investigation is expected to continue for three years. First efforts were directed toward discovery of factors influencing the hatching of eggs in the soil, development of infectivity of the larvae and route by which the seal pups are infected.

The relatively late start and low larval population in the soil retarded work on infective larvae in 1959.

A report on the research for 1959 is due on 1 February 1960.

## Pelage Studies

On 31 July 1959, a report on "Pelage and Surface Topography of the Northern Fur Seal," by V. B. Scheffer, was completed. It describes gross and microscopic features of the body covering; variation with age, season, and sex; anomalies; and certain aspects of the Pribilof sealskin industry. Specimens of pelage are now being collected for "A Seasonal Study of Molt in the Fur Seal." In this investigation, the growth and replacement (molt) of underfur and guard hairs will be measured on samples of pelage taken from the midback of seals of both sexes and many ages, in all months of the year.

## Dentition Studies

The postnatal dentition of the seal is well known as a result of studies since 1949 of annual growth layers (annuli) and their significance in age identification. Little is known, however, about the prenatal dentition. Staff members, in cooperation with the University of Washington School of Dentistry, expect to begin a study of the succession and calcification of teeth in fur-seal fetuses. A report is due at the end of 1961.

## Female Skins

### Background

A sample of 248 skins from tagged females was collected in August 1958 and marked with special fiber tags giving the age and length of each animal. Fifty-nine of the skins had the field number marked on the tag in addition to the known age and length. These skins were processed by the Fouke Fur Company, St. Louis, Missouri, and the finished grade and size of each skin was then associated with the field length, age, and reproductive condition of the animal. This study was made to determine the quality of female skins from seals of various sizes and ages, including both pregnant and nonpregnant animals. The results are not statistically conclusive; however, they are regarded as valid indications of the skin conditions to be expected in similar circumstances.

### Results

It can be seen from tables 17 and 18 that the percent of "regular"[1/] skins is increased by exclusion of skins from the larger animals. Within the 40- to 44-inch length range, the percentage of "regular" skins is about 51 percent. A female kill made only for commercially usable skins would probably be held as nearly as possible within this range. Because of the inclusion of all available known-age (tagged) females, the sample was biased toward older age groups, hence a lower average "regular" percentage resulted than would be expected from the over-all 1958 take.

The effect of reproductive condition upon skin grade has been an unknown factor and, in part, led to collection of these data. The finished skin grade was determined for 59 females of known reproductive condition. The small sample size prohibits definite conclusions about the percentages of "regular" and "scarred" finished skins to be expected from pregnant and nonpregnant females of given ages. The data in table 19 leads to the obvious conclusion, however, that younger females are generally nonpregnant and yield a high percentage of "regular" skins; the reverse is typical of older females. These results corroborate the general claim that larger female skins usually yield a low-quality, finished product. A graphic representation of the relation of age and "regular" skin grade is made in figure 13.

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1/ "Regular" is a term used for a prime unblemished skin.

Table 17. --Size and grade[1/] of 59 known-age sealskins, by length and reproductive condition

| Size reproductive condition, and grade | Length (inches) | | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | |
| SMALL | | | | | | | | | | | | | | |
| nonpregnant | | | | | | | | | | | | | | |
| regular | 4 | 4 | 1 | 1 | - | - | - | - | - | - | - | - | - | 10 |
| scarred | - | - | 5 | 1 | 1 | - | - | - | - | - | - | - | - | 7 |
| MEDIUM | | | | | | | | | | | | | | |
| pregnant | | | | | | | | | | | | | | |
| regular | - | - | - | - | 1 | 1 | - | 1 | - | - | - | - | - | 3 |
| scarred | - | - | - | - | - | 1 | 1 | - | 1 | - | - | - | - | 3 |
| nonpregnant | | | | | | | | | | | | | | |
| regular | - | - | 1 | 3 | 3 | 1 | - | 1 | - | - | - | - | - | 9 |
| scarred | 1 | - | - | 3 | 2 | 2 | 1 | - | - | - | - | - | - | 9 |
| LARGE | | | | | | | | | | | | | | |
| pregnant | | | | | | | | | | | | | | |
| regular | - | - | - | - | - | 1 | - | - | 1 | - | - | - | - | 2 |
| scarred | - | - | - | - | - | 1 | 2 | 1 | 2 | - | - | - | - | 6 |
| III | - | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| nonpregnant | | | | | | | | | | | | | | |
| regular | - | - | - | - | 1 | 1 | 1 | - | - | - | - | - | - | 3 |
| scarred | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | 2 |
| X LARGE | | | | | | | | | | | | | | |
| pregnant | | | | | | | | | | | | | | |
| scarred | - | - | - | - | - | - | - | - | - | - | - | 1 | - | 1 |
| III | - | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 |
| nonpregnant | | | | | | | | | | | | | | |
| scarred | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 | 2 |
| Total | 5 | 4 | 7 | 8 | 8 | 9 | 7 | 4 | 4 | - | 1 | 1 | 1 | 59 |

[1/] Size and grade by Fouke Fur Company.

Table 18. --Size and grade[1/] of 248 sealskins, by length[2/]

| | | 40" | 41" | 42" | 43" | 44" | 45" | 46" to 52" | 40" to 43" | 40" to 45" |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Percent | | | | |
| Size: | LARGE | 0.0 | 3.0 | 2.8 | 0.0 | 2.9 | 24.1 | 56.9 | 1.7 | 5.5 |
| | MEDIUM | 18.7 | 24.3 | 34.3 | 61.8 | 80.0 | 75.9 | 41.4 | 37.3 | 51.6 |
| | SMALL | 81.3 | 72.7 | 62.9 | 38.2 | 17.1 | 0.0 | 1.7 | 61.0 | 42.9 |
| Grade: | Regular | 56.3 | 63.6 | 45.7 | 55.9 | 34.3 | 34.5 | 22.5 | 55.1 | 47.8 |
| Total[3/] | | 6.7 | 13.7 | 14.6 | 14.1 | 14.6 | 12.1 | 24.2 | 49.1 | 75.8 |

[1/] Size and grade by Fouke Fur Company.

[2/] Field length

[3/] The percentages for measurements 40-52 inches total 100. The last two percentage columns on the right show the percent of total skins in the measured groups indicated.

Table 19. --Size and grade[1/] of 59 known-age sealskins, by age and reproductive condition

| Size, reproductive condition, and grade | Age | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | |
| SMALL | | | | | | | | | |
| nonpregnant | | | | | | | | | |
| regular | 3 | 7 | - | - | - | - | - | - | 10 |
| scarred | 1 | 6 | - | - | - | - | - | - | 7 |
| MEDIUM | | | | | | | | | |
| pregnant | | | | | | | | | |
| regular | - | - | - | - | 3 | - | - | - | 3 |
| scarred | - | - | - | 1 | 2 | - | - | - | 3 |
| nonpregnant | | | | | | | | | |
| regular | - | 6 | - | 1 | 2 | - | - | - | 9 |
| scarred | - | 3 | 2 | 2 | 2 | - | - | - | 9 |
| LARGE | | | | | | | | | |
| pregnant | | | | | | | | | |
| regular | - | - | - | 1 | 1 | - | - | - | 2 |
| scarred | - | - | - | - | 2 | 1 | - | 3 | 6 |
| III | - | - | - | - | - | - | - | 1 | 1 |
| nonpregnant | | | | | | | | | |
| regular | - | 1 | - | 2 | - | - | - | - | 3 |
| scarred | - | - | - | 1 | 1 | - | - | - | 2 |
| X LARGE | | | | | | | | | |
| pregnant | | | | | | | | | |
| scarred | - | - | - | - | - | - | - | 1 | 1 |
| III | - | - | - | - | - | - | 1 | - | 1 |
| nonpregnant | | | | | | | | | |
| scarred | - | - | - | - | - | 1 | - | 1 | 2 |
| Total | 4 | 23 | 2 | 8 | 13 | 2 | 1 | 6 | 59 |

| Size | Regular | Scarred | III | Total | Percent |
|---|---|---|---|---|---|
| SMALL | 10 | 7 | - | 17 | 29 |
| MEDIUM | 12 | 12 | - | 24 | 41 |
| LARGE | 5 | 8 | 1 | 14 | 24 |
| X LARGE | - | 3 | 1 | 4 | 6 |
| | | | | 59 | 100 |

[1/] Size and grade by Fouke Fur Company.

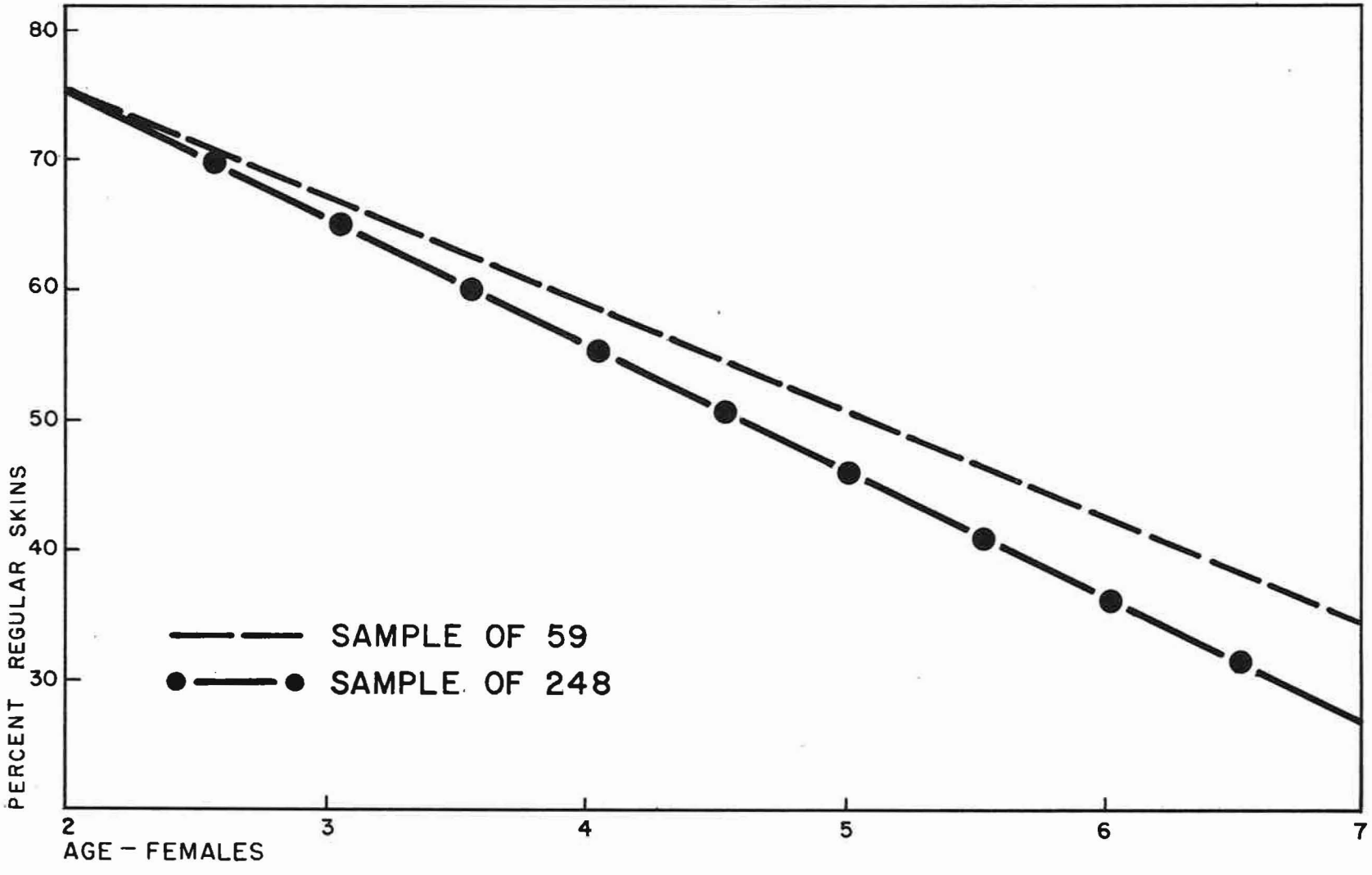


Figure 13. --Percent "regular" finished female skins, by age.

## Blood Studies

Positive evidence for the existence of blood types in fur seals was obtained this year by performing agglutinin absorption tests with immune antisera prepared in a rabbit, a goat, and a dog in the fall of 1958. Four individuals out of 25 tested, possessed a unique antigen in their red cells. Such differences may prove valuable as markers for the study of intermingling of separate populations.

Arrangements were made with Dr. Fujino (Whales Research Institute, Tokyo, Japan) to exchange samples and antisera so that fur seals from Japanese waters can be compared with those from the Pribilof Islands.

Further tests of the glycerol freezing technique for preservation of red cells have been made in order to allow testing of individual samples over longer periods of time. (Dr. George J. Ridgway, Serologist, Marine Investigations, Biological Laboratory, Bureau of Commercial Fisheries, Seattle, Washington.)

## Food Habits

The stomach contents of one seal collected at Northeast Point, St. Paul Island, contained parts of one or two sand lance (Ammodytes tobianus), parts of three Alaska pollack (Theragra chalcogramma), and two gastropod shells containing hermit crabs, which had probably been eaten by the pollack. The stomach contents were examined by C. H. Fiscus (Marine Mammal Research, Seattle, Washington).

# OTHER WILDLIFE SPECIES

## Reindeer

A count of the reindeer herd was made 13 August by Carl Abegglen, Terence O'Brien, Thomas O'Brien, David Reilly, and Lavrenty Stepetin.

The five men had formed two groups and covered the area from Ridge Wall and from Southwest Point northeast to Crater Hill.

The reindeer herd was located in the afternoon on the west slope of Crater Hill. Fog prevented making more than six counts which ranged from 200 to 225. One party went around Crater Hill and succeeded in turning the herd to the southwest but again fog prevented a count. Casual observations made during the summer by research and management personnel indicated a successful breeding season in 1958 as calves were scattered throughout the herd. Considering this and a total of 233 animals remaining after the 1958 harvest, it is possible that the 1959 count did not include all animals in the herd.

Counts from a photograph of the herd taken in June 1959 averaged 210 animals. Again, this is lower than the expected number and it is possible that the entire herd was not photographed.

## Sea Lions

Walrus Island was visited by Abegglen, Juelson, and Reilly 21 July for the purpose of tagging sea lion (Eumatopias jubata) pups. Walrus Island, located 10 miles east of St. Paul Island, is the breeding ground for an estimated 2,000 to 2,500 sea lions. Because of its location, the island has only occasional fair-weather visitors. Little is known about the migratory habits of Steller sea lions or about their life expectancy. For this reason, plans were made for a tagging program to begin in 1959 on Walrus Island where sea-lion pups are relatively easy to tag.

Over 100 sea-lion pups were tagged by the State of Alaska, Department of Fish and Game, on Lewis Island, Gulf of Alaska, in 1957 (Alaska Department of Fish and Game, 1957).

The harems had broken up by 21 July and it was easy to land and move around on the island. It was estimated that the average weight of the pups tagged exceeded 100 pounds. The large size and strength of the pups forced the tagging to be done on a "catch-as-catch-can" basis. Usually several pups would be forced into a location between large boulders where their heads could be held down and body movements restricted. The right foreflipper was pulled up and a tag attached near the junction of the flipper and the body. The pelage of the pups, at the time of tagging, was quite dense and chocolate brown in color. All pups seen gave the appearance of being in good condition.

The monel metal tags (fig. 14) were made by National Band and Tag Company, Newport, Kentucky, with the following specifications:

| | |
|---|---|
| over-all folded length of tag | 2.5 inches |
| span of clinched tag | 5/8 (.625) inch |
| width of tag | 3/8 (.375) inch |
| thickness of metal | .035 inch |
| printing - | |
| inside of clinch point side | Notify F & W Service Seattle, Wn. |
| outside of clinch guard side | XA - 1 to 2000 |

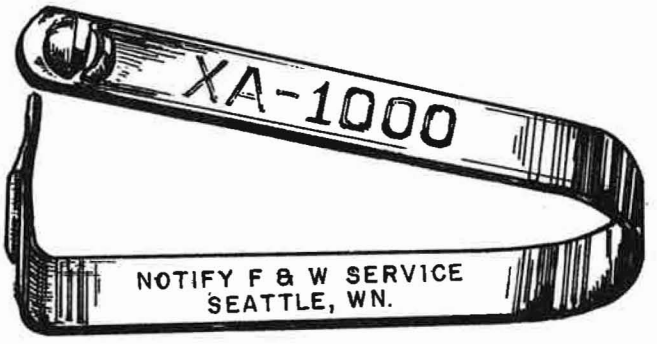


Figure 14. -- Tag used in sea-lion tagging program showing lettering in relation to clinch side of tag (clinched length: 68 mm.).

Applicators were fabricated to handle the special size sea-lion tag.

Inadequate design appeared in both tags and pliers. The thickness of metal should be increased to strengthen the tag or the material should be stainless steel instead of monel metal. The material used should have resistance to twisting hand pressure; the present tag can be easily bent during the plier-loading process. The pliers (applicators), designed to handle the larger sea-lion tag, lacked the tension spring and retaining cup which are part of the smaller tagging pliers used for marking fur seals. Experience gained from tagging the 100 sea-lion pups proved that these are basic features that should have been a part of the pliers.

Future tagging will be done at least one week earlier and with remodeled tagging pliers.

## Sea Otter

The first transplant, 9 April 1955, was unsuccessful. The period since 1955 has been used to determine the requirements for successful sea-otter transplants. The second transplant of sea otters to the Pribilof Islands appears to be successful. (Kenyon, K. W. 1959. Sea otter transplant Amchitka Island to the Pribilofs in 1959. Manuscript report.)

Seven sea otters (4 females and 3 males) were flown to St. Paul Island from Amchitka Island on 20 May 1959 after being captured and held for a two-week adjustment period. All the animals were released near a reef at Polovina Point and three sea otters were seen the following day. The most recent known observation of sea otters was made 21 August by a group of Aleut fishermen who reported seeing five sea otters near Otter Island, six miles off St. Paul Island. An unverified report was also made from St. George Island.

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Appendix A

# PRELIMINARY REPORT ON FORECASTING THE KILL OF MALE FUR SEALS ON THE PRIBILOFS

(Methods and application to St. Paul Island for 1959)

Douglas G. Chapman
7 August 1959

## SUMMARY

Several methods are discussed. Those based on tag returns and the population estimates do not appear satisfactory at present.

The total harvest of 3-year males can be forecast from the kill to the end of round 3 (July 11) in 1959. For St. Paul Island, this method yields a forecast total kill (in 1959) of 9,469 with a confidence interval of 6,477 to 17,604.

The estimate of escapement of 3-year males can provide a forecast of the 4-year kill of the following year. Two variations on this basic method are discussed. These yield estimates of the 1959 St. Paul 4-year male harvest of 5,828 and 11,903, respectively.

A further study must be made of the confidence intervals for these estimates. The best that can be said at present is that they are correct (with 95 percent confidence) to within $\pm$ 6,000.

The early round kill of 4-year-olds also yields a forecast of the total kill. For St. Paul in 1959, the estimate is 10,188 (with a confidence interval of 6,200 to 28,564).

While these forecasts appear satisfactory, they must be accepted with caution because of the large confidence intervals associated with them.

## INTRODUCTION

Since it is important to have a forecast of the harvest of male seals on the Pribilofs as early as possible, we review here some of

the possible methods and apply them to 1959 data for St. Paul Island. We consider first the 3-year-old males and then the 4-year-olds.

## Forecasts from Early Pup-population Estimates

As yet, no scheme seems feasible for obtaining a tag-sample census of the pups while they are still on land. It is possible that pelagic samples will make available data from which estimates can be obtained -- but only if the youngest ages are adequately represented in the pelagic samples, which has not been the case up to the present.

A third possibility is basing a population estimate upon the recovery of tags from 2-year-olds. Now that a very large number of fur-seal pups are being tagged, this is definitely possible. A fourth possibility is to base the population estimates upon tag recoveries of 3-year males during the early rounds of the season. This procedure necessarily delays any forecast until after the season has actually begun.

There remains a fundamental problem, however, that of relating the population estimates and the returns of the males to the harvests as 3- and 4-year-olds. Variations that have occurred during the past several years in population estimates appear to be largely sampling fluctuations. Only the estimates based on male tag recoveries of the 1953 and 1954 year classes have differed significantly from other estimates. For 1953 and 1954, the estimates indicated large September pup populations and yet the returns from these year classes have been below average for the period since tagging studies were begun (for the 1947-1954 year classes).

More specifically, a correlation and regression study has been conducted on the relationship (for St. Paul) between total male kill from a year class and the estimated size of the year class as well as the 3-year male kill and the estimated size. In each case, the estimates are based on tag recoveries at age three.

The results are as follows:

Correlation between total male harvest from a year class and estimate of the year-class pup size, based on 3-year male tag recoveries

$$r = -0.64 \text{ with } 5 \text{ d.f.}$$

This is not significantly different from zero at the 5 percent level.

Correlation between 3-year male harvest from a year class and estimate of the year-class pup size, based on 3-year male tag recoveries

$$r = -0.31 \text{ with } 6 \text{ d.f.}$$

This is not significantly different from zero.

We have also calculated the linear relationship for the latter case. It is:

Kill (thousands) = 37.2 - (.116) Estimate (10,000's)
Thus, if estimate = 300,000, estimated kill = 37.2 - (30) (.116) = 37.2 - 3.48 = 33.72;
if estimate = 700,000, estimated kill = 37.2 - 70 (.116) = 29.08.

For all practical purposes, the forecast obtained is the mean 3-year kill.

Moreover, since the actual forecast would have to be based upon the much more variable population estimates from 2-year-old recoveries or from recoveries during the first few rounds of the season, it is clear that this approach is unsatisfactory.

## Forecasts from Early Round Returns of 3-year Male Kill

The actual returns have been used for some years to make estimates of escapement. These are based on "completing" by estimation, normal distribution curves. This approach is not possible when data are available only from the early rounds: there is insufficient data to estimate the parameters properly. However, a simpler approach may be possible: a simple comparison of percentage of returns at a comparable date in other years.

We show in table 1 the percentage of returns up to the end of the round terminating July 11 or 12 of all returns up to the end of the season or to July 31, whichever came first (male killing in 1956 and 1957 continued into August).

Table 1. --Percentage of male seal harvest in rounds ending July 11 or 12, from 1950 through 1958

| Year | (a) 3-year harvest to round ending July 11 or 12 | (b) 3-year harvest to end of season or to end of July (actual date in parentheses) | (c) Percentage in harvest in early rounds, i.e., $100\frac{(a)}{(b)}$ |
|---|---|---|---|
| 1950 | 14,343 | 31,746 (27) | 45.2 |
| 1951 | 9,363 | 30,014 (29) | 31.2 |
| 1952[1/] | 10,808 | 29,697 (27) | 36.4 |
| 1953 | 13,138 | 40,506 (29) | 32.4 |
| 1954 | 9,641 | 32,350 (27) | 29.8 |
| 1955 | 7,087 | 30,733 (31) | 23.1 |
| 1956 | 6,145 | 26,590 (31) | 23.1 |
| 1957 | 4,507 | 16,804 (31) | 26.8 |
| 1958 | 8,038 | 27,216 (31) | 29.5 |

1/ No age readings made until June 30; early round returns estimated from tag recoveries.

This table suggests that there may be some possibility in this approach but the value of the table is limited by the fact that the date of termination of killing has varied. Essentially, in the first five years, killing terminated one round earlier than the July 31 date, though there was an additional 2-day, post-season round in 1951 and 1953.

To compensate for this, we have estimated the returns for one additional complete round for 1950-1954. The results are shown in table 2.

Table 2. --Percentage of returns to July 31, in early rounds, of 3-year male seals

| Year | (a) 3-year male kill to round ending July 11 or 12[1/] | (b) 3-year returns to July 31 or Aug. 1 last round estimated for 1950-1954 | (c) $100\frac{(a)}{(b)}$ |
|---|---|---|---|
| 1950 | 14,343 | 35,543 | 40.4 |
| 1951 | 9,363 | 35,464 | 26.4 |
| 1952[2/] | 10,808 | 34,229 | 27.3 |
| 1953 | 13,138 | 45,984 | 28.6 |
| 1954 | 9,641 | 39,102 | 24.7 |

Table 2 (con.). --Percentage of returns to July 31, in early rounds, of 3-year male seals

| Year | (a) 3-year male kill to round ending July 11 or 12[1/] | (b) 3-year returns to July 31 or Aug. 1 last round estimated for 1950-1954 | (c) $100\frac{(a)}{(b)}$ |
|---|---|---|---|
| 1955 | 7,087 | 31,222[3/] | 22.7 |
| 1956 | 6,145 | 26,590 | 23.1 |
| 1957 | 4,507 | 16,804 | 26.8 |
| 1958 | 8,038 | 27,216 | 29.5 |
| Average | 9,230 | 32,461 | 27.7[4/] |

1/ Up to 1955, a complete round ended on July 12 and the "extra" round falls July 28 - Aug. 1. From 1956 on, the complete round ended on July 11 and another complete round on July 31.

2/ See footnote 1/ of table 1.

3/ The last round in 1955 was incomplete -- no kill was made on Reef hauling ground. The returns on Reef have been estimated and added to the figure given in table 1 for 1955 3-year harvest.

4/ This is the unweighted average of the percentages given in column (c).

Estimate for 1959

In 1959 the kill of 3-year males up to July 11 was estimated from tooth-ridge readings to be 2,623. Hence, the estimate of the 1959 kill, to July 31 of 3-year males, is $\frac{2623}{27.7} = 9,469$.

A confidence interval for this estimate can be easily found by calculating the variance of the percentages in column (c) of table 2 and by referring to the usual t-table. The 95 percent confidence interval, based on the nine observations, is:

$$\frac{2623}{40.5} \quad \text{to} \quad \frac{2623}{14.9} \quad \text{or} \quad (6,477 \text{ to } 17,604).$$

## Forecasts of 4-year Male Kill from Size of Pup Crop

The forecast of the kill of 4-year males appears easier since, for this forecast, there is available the data on 3-year kill and, hence, the estimate of 3-year escapement as well as the full returns of tags from the 3-year-old animals.

Table 3 shows the population estimates and the corresponding 4-year-old harvests (the estimates are of the pup population on St. Paul Island at the time of tagging).

Table 3. --Population estimates and harvest of 4-year males from this year class

| Year class | Estimate (1,000's) [1/] | 4-year male harvest |
|---|---|---|
| 1947 | 391 | 19,,658 |
| 1948 | 484 | 19,995 [2/] |
| 1949 | 466 | 12,502 |
| 1951 | 498 | 18,083 |
| 1952 | 513 | 31,448 |
| 1953 | 638 | 8,855 |
| 1954 | 731 | 5,599 |

1/ Estimate based on tag recoveries from 3-year males.

2/ Proportions of 3- and 4-year males estimated from tag recoveries prior to June 30 of this season, as no tooth-ridge readings were available.

The correlation between the population estimates and the 4-year harvest is -0.63. This is fairly large but not significant since it is based on only seven observations. Moreover, it must be noted that the 1953 and 1954 year classes were subject to above-normal kill as 3-year-olds when the 1956 and 1957 seasons were extended to August 15 and August 10, respectively. If adjustments were made for this, the relationship between estimate and 4-year harvest is very small and of little value in forecasting.

## Forecasts of 4-year Male Kill from 3-year Escapement

The possibility of making such estimates, on the basis of 3-year escapement estimates, was the subject of a study in 1957 reported in Appendix KK, pp. 143-162 of Alaska Fur Seal Investigations, Pribilof Islands, Alaska (1957), see especially page 161.

Using the methods that have been reported on in earlier reports on escapement for 1958, we have the following estimates:

Estimated proportion of 3-year males escaping harvest by arriving after killing season = 15.

Estimated proportion of 3-year males escaping harvest due to being under or oversized = 5.5.

Estimated total proportion escaping is: 0.197.

St. Paul kill of 3-year males in 1958:

| | | |
|---|---|---|
| To July 31 | - | 27,863 |
| August | - | 814 1/ |
| Total | - | 28,677 |

Therefore, total number of 3-year males returning to St. Paul in 1958 is estimated to be

$$\frac{27,863}{1-.197} = \frac{27,863}{.803} = 34,699$$

Estimated escapement is (34,699 - 28,677) (1.17) = 7,046. The factor 1.17 comes from the empirical correction suggested in Appendix KK of the 1957 report and used in the estimates of escapement subsequently.

Now, predicted kill for 1959 is:

Survivors of escapement - 4-year male escapement of 1959.

For the estimate of natural mortality, we use the figure 0.06

---

1/ Partly estimated from tag recoveries.

that was given in the report by Kenyon, Scheffer, and Chapman.

For the estimate of 4-year escapement, we use the figure .12, or average of past estimates (for the period beyond July 31).

Therefore, predicted kill is (7,046) (.94) (.88) = 5,828.

An alternative approach to this prediction, based on this method, is to use an average estimate of 3-year male escapement. In Appendix KK of the 1957 report, it was noted that the use of an average figure gave a better comparison with the following 4-year returns than the use of individual estimates for each year (cf. p. 159). In table 4 we show the estimated post-season escapements that would have occurred from 1950 to 1958, had killing terminated July 31 each year.

Table 4. --Proportion of killable sizes of 3-year-old males returning after July 31, for 1950-58

| Year | Proportion |
|---|---|
| 1950 | 0.11 |
| 1951 | 0.38 |
| 1952 | 0.12 |
| 1953 | 0.46 |
| 1954 | 0.37 |
| 1955 | 0.31 |
| 1956 | 0.26 |
| 1957 | 0.35 |
| 1958 | 0.18 |
| Average | 0.28 |

The average through-the-season escapement for this period is 6 percent (see 1958 Alaska Fur Seal Investigations, p. 88). Therefore, total escapement estimate = 1 - (.72) (.94) = 1 - .68 = 0.32. Using this estimate, 1958 returns to St. Paul are estimated to be

$$\frac{27,863}{1-.32} = 40,975.$$

Therefore, escapement = (40,965 - 28,677) (1.17) = 14,389.

Predicted 1959 kill = (14,389)(.94)(.88) = 11,903.

The sampling error of these estimates was discussed on page 92 of Alaska Fur Seal Investigations, 1958. It was suggested there that the standard error of the 1953 3-year male escapement might be about 3,000. This figure is not unreasonable for the estimates given here, based on the estimated escapements.

## Forecasts of 4-year Male Kill from Early Round Returns

As in the case of the 3-year males, it is possible to base a forecast of total kill of 4-year males on the kill, in the early rounds. We will use the same base as that used for the 3-year-olds, i.e., the round ending July 11 or 12. The pertinent data is shown in table 5.

Table 5.--Percentage of returns to July 31 in early rounds of 4-year male seals

| Year | (a) 4-year male kill to round ending July 11 or 12 | (b) 4-year return to July 31 or Aug. 1 1/ | (c) $100\frac{(a)}{(b)}$ |
|---|---|---|---|
| 1950 | 8,000 | 17,487 | 45.8 |
| 1951 | 10,762 | 21,427 | 50.2 |
| 1952 2/ | 13,997 | 21,795 | 64.2 |
| 1953 | 5,714 | 13,627 | 41.9 |
| 1954 | 9,667 | 16,748 3/ | 57.7 |
| 1955 | 4,169 | 18,305 3/ | 22.8 |
| 1956 | 12,677 | 28,560 | 44.4 |
| 1957 | 3,296 | 8,855 | 37.2 |
| 1958 | 2,658 | 5,556 | 47.8 |

1/ The 4-year male kills of 1950-54, when the season terminated prior to July 31, were estimated using an average multiplier of 1.09. The estimated post-season escapement of these years was 9 percent, most of which would have occurred in the round following the end of the killing season.

2/ See footnote 1/ of table 1.

3/ See footnote 3/ of table 3.

The average of these percentages is 45.7, with a standard deviation of 12.1.

Estimate for 1959

In 1959 the kill of 4-year males up to July 11 was 4,656. Therefore, estimate of total harvest to July 31 is:

$$\frac{4,656}{.457} = 10,188$$

Confidence limits for this are:

$$\frac{4,656}{75.1} \text{ to } \frac{4,656}{16.3}$$

or (6,200 to 28,564).

It should be observed that the percentages in table 5 are much more variable than those given in table 2 (for 3-year-olds). It follows that the confidence interval for this estimate is much wider.

It remains a problem to study whether the information from 3-year male escapement estimates of the previous year can be combined with information on kill during early rounds to yield a better estimate.

Appendix B

# POPULATION STUDY OF FUR SEALS OF ST. PAUL ISLAND WITH SPECIAL REFERENCE TO FEMALE KILLING PROGRAM

Douglas G. Chapman
9 November 1959

## SUMMARY

1. The best estimates of the 1947-57 year classes on St. Paul Island are as follows:

| | |
|---|---|
| 1947-49 | 500,000 |
| 1951 | 490,000 |
| 1952 | 530,000 |
| 1953 | 620,000 |
| 1954 | 660,000 |
| 1955 | 740,000 |
| 1956 | 880,000 |
| 1957 | 770,000 |

By year class is meant the number of pups at birth. These estimates are tagging estimates.

2. The sharp increase from 1947-51 to 1956 may be partly explained by a real increase in the number of adult females and may be partly fictitious, i. e., due to sampling errors. A large part can only be explained by an increase in the pregnancy rate among adult females. There is no data to support a change of the magnitude indicated though a slight increase in the pregnancy rate was observed in 1958 as compared with the 1952 pelagic sample.

3. An analysis of returns of bachelors indicates that the proportion returning has been a decreasing function of the year class size, if we accept the above year class estimates, for the period 1947-55.

4. The analysis referred to in 3. suggests that a critical factor in the population dynamics of the fur seal is mortality from age 0 to age 3 and it suggests further that this mortality is density dependent.

5. The population of adult females can be estimated in two ways: Method 1 assumes that males and females survive equally to age 4 as far as natural factors are concerned. Since there is a good

estimate of male returns, we have then an estimate of female returns. Summing up the several age classes and allowing a minimum estimate for natural mortality yields the following estimates:

| | | |
|---|---|---|
| Adult female population | 1956 | 650,000 |
| " " " | 1959 | 490,000 |
| Decrease (due to female harvest and poor returns of 1953-56 year classes) | | 160,000 |

6. These figures are inconsistent with the number of pups born as estimated from tagging. The 1955 year class estimate based on about 4,000 tag returns from nearly 50,000 tags placed is 740,000. The maximum pregnancy rate observed in pelagic (presumably random) samples of the fur seal is 0.80 (off Japan 1952). These two figures indicate an adult female population of at least 925,000 in 1955.

This number implies that the male returns to age 4 are smaller than female returns. This is Method 2.

7. Allowing for losses due to small year classes and for the female kill of 1956-59, the present estimate of adult females is at least 750,000.

8. If the minimum estimates of Method 1 are accepted (given in 5 above) and if no further reduction of the herd is contemplated, a continuing harvest of 14,000 females is indicated for St. Paul Island (and a proportionate number on St. George Island).

9. If the larger estimates of Method 2 (6 and 7 above) are accepted, further reduction of the adult female seal herd is indicated and the kill for St. Paul Island in 1960 should be at least as large as 1958-59, i. e., about 24,000.

## Population Estimates of St. Paul Island Fur Seal Pups from 1958-59 Tag Recoveries

Tables 1 and 2 show the usual Petersøn formula estimates. The formula is

$$N = \frac{(n + 1)(t + 1)}{S + 1}$$

where

N = population estimate [of the number of pups on St. Paul Island at the time of tagging]

n = number of seals from the specified age group in the commercial kill (estimated from tooth age analysis)

t = number of seal pups originally tagged in this year class on St. Paul Island

S = number of tagged and tag-lost seals recovered from the commercial kill (of the specified year class)

Table 1.--Estimates based on 1958 recoveries

| Year class | Tag series | n | t | s | N |
|---|---|---|---|---|---|
| | | | Male recoveries | | |
| 1956 | I | 885 | 39,900 | 101 | 338,773 |
| 1955 | H | 27,912 | 49,870 | 2,126 | 654,466 |
| 1954 | G | 5,599 | 10,000 | 92 | 602,211 |
| 1953 | F | 54 | 10,388 | 4 | 114,279 |
| | | | Female recoveries | | |
| 1956 | I | 477 | 39,900 | 12 | 1,467,129 |
| 1955 | H | 9,762 | 49,870 | 631 | 770,396 |
| 1954 | G | 6,736 | 10,000 | 137 | 488,237 |
| 1953 | F | 2,719 | 10,388 | 59 | 470,968 |

Note: Estimates from B, CS, D, and E recoveries are omitted as unreliable since female seals above 45-3/4" in length were to be spared in 1958, except for tagged animals. Hence the tag recoveries are not representative.

Table 2. --Estimates based on 1959 recoveries

| Year class | Tag series | n | t | s | N |
|---|---|---|---|---|---|
| | | | Male recoveries | | |
| 1957 | J | 1,081 | 39,870 | 65 | 653,643 |
| 1956 | I | 10,202 | 39,900 | 491 | 827,459 |
| 1955 | H | 10,438 | 49,870 | 892 | 583,636 |
| 1954 | G | 557 | 10,000 | 8 | 620,062 |
| | | | Female recoveries | | |
| 1957 | J | 215 | 39,870 | 7 | 1,076,517 |
| 1956 | I | 1,769 | 39,900 | 79 | 882,810 |
| 1955 | H | 6,379 | 49,870 | 405 | 783,687 |
| 1954 | G | 3,099 | 10,000 | 64 | 476,971 |
| 1953 | F | 2,416 | 10,388 | 46 | 534,260 |
| 1952 | E | 2,848 | 19,979 | 121 | 466,582 |
| 1951 | D | 1,495 | 1,000 | 6 | 213,928 |
| 1949 | CS | 850 | 19,963 | 29 | 566,312 |

The wide variation of estimates that has been apparent for several years is still evident. In the past two reports attention was called to the differences between estimates based on male recoveries and those based on female recoveries. These differences, while mainly in one direction, were insignificant for the 1947-52 year classes but become large and significant for the 1953 and 1954 year classes (F and G tag series). The most recent recoveries leave this discrepancy unsolved as far as the 1953-54 year classes are concerned. The estimates based on female recoveries for the 1955-57 year classes were greater than estimates based on male recoveries. A number of possible explanations of the 1953-54 discrepancy were discussed in Population Report No. 4. Most of these were discarded after investigation though it was noted that differential straying of sexes could account for part of the observed difference. A further possible explanation is explored below.

Since there are now available as many as eight separate estimates for any year class, and through 1957, eleven year classes had been tagged in the postwar series, it is thought advisable to treat each year class separately rather than attempt a discussion of combined estimates for all years simultaneously.

## Estimates of the 1947-48-49 Year Classes: A, B, CS Tag Series

Though tags from A, B, and CS series continue to be recovered, the numbers are insignificant compared to the 6,093 tags recovered from male seals of these classes in 1950-53. However, in calculating the estimates in earlier reports it was overlooked that the 1952 age analysis and tag recoveries were for different periods. Tag recoveries were made throughout the season but data for age analysis was not collected until 30 June and, for a complete round, not until 3 July.

The tag recoveries prior to 3 July were used to estimate the age composition of the kill during early rounds (table 3). The age composition of the kill for rounds 3 to 7 was obtained from the usual tooth age analysis. The figures underlined for rounds 1 and 2, the former including the preseason kill, were estimated from tag recoveries making use of the relative number (tag ratio) of B and CS tag recoveries in later rounds.

Table 3. --1952 tag recoveries and age composition of the kill by round

| Age | Round 1 [1] | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|---|---|---|---|---|---|---|---|---|
| | | | | Tag recoveries | | | | |
| 3 | 24 | 76 | 147 | 206 | 215 | 245 | 286 | 1,199 |
| 4 | 118 | 119 | 127 | 125 | 114 | 80 | 73 | 756 |
| | | | | Age composition of the kill | | | | |
| 3 | 668 [2] | 1918 [2] | 3187 | 5035 | 6308 | 5329 | 7252 | 29,697 |
| 4 | 3439 [2] | 3145 [2] | 3026 | 4387 | 2503 | 1854 | 1641 | 19,995 |
| | | | | | | | | 49,692 |
| Total kill, all age groups | 4107 | 5063 | 6269 [3] | 9538 [3] | 9014 [3] | 7462 [3] | 9947 [3] | 51,400 |

1/ Including the preseason kill.

2/ Estimates; no allowance was made for 2- and 5-year-old age groups in these two rounds.

3/ Totals for rounds 3 through 7 include 2- and 5-year-old males.

The revised B and CS estimates, including the estimates based on female recoveries through age 10, are shown in table 4.

Table 4. --Best estimates of 1947-48-49 year classes
(St. Paul pup population at time of tagging)

| Estimates based on recoveries from | Tag series A | B | CS |
|---|---|---|---|
| Males | 425,800 | 474,900 | 470,100 |
| Females | --- | 315,600 | 464,000 |
| Combined | 425,800 | 468,400 | 469,600 |

Best estimate for 1947-48-49 454,600

Adding dead pup estimate = 50,000

Estimate of St. Paul 1947-48-49 year classes = 500,000

## 1951-52 Year Classes: D-E Tag Series

In 1951 only 1,000 pups were tagged (D series), all from one rookery. Yet the estimates based on male recoveries from this limited tagging were consistent with estimates from other tag series. The estimates from female recoveries have been lower than the estimates from male recoveries. To what extent this discrepancy is due to the limited tagging program associated with the less complete sampling of females than males is difficult to say.

For the E series, the female recovery estimate falls much below the male recovery estimate, though, as seen in Population Report No. 4, the difference was not significant. The results are shown in table 5. Though we give the combined estimates as "best" estimates, attention is called to the consistency of estimates of pup classes 1947-48, 1951-52 from the male recoveries (tables 4 and 5).

Table 5. --Best estimates of 1951-52 year classes
(St. Paul pup population at time of tagging)

| Estimates based on recoveries from | Tag series D | Tag series E |
|---|---|---|
| Males | 478,100 | 475,200 |
| Females | 231,700 | 383,200 |
| Combined | 413,600 | 451,500 |

Combined mean of estimates A - E = 445,800

## 1953-54 Year Classes: F-G Tag Series

Estimates based on F and G-tag series from male recoveries far exceeded earlier estimates based on either sex, (table 6). Heretofore, we have regarded these high estimates (from male tag recoveries) as unacceptable. The population estimates from later series from both male and female recoveries are, however, as large or larger.

As the tagging experiments have shown, the homing tendency of females at ages 3, 4, and 5 is stronger than that of males. Intermingling of male seals from St. George Island and possibly from Asian herds could inflate the St. Paul Island estimate based on male recoveries. A satisfactory quantitative evaluation of this factor will be possible when returns through age 5 or 6 are completed from some of the series (I and later) in which tagging took place on St. George Island as well as on St. Paul Island. Meanwhile, the evidence of straying from St. Paul Island to St. George Island suggests a 6 percent differential due to straying from St. George Island to St. Paul Island (Population Report No. 4, p. 74).

Another possible cause of error is that males and females are not sampled representatively in the tagging operation. This could occur if one sex tended to go to sea earlier or if there were clustering by sexes on land. It should be noted that the validity of the total population estimate does not depend on the pup sex ratio being 1:1, though that has always been assumed. A source of possible discrepancy would be a difference between the true sex ratio and the sex ratio of pups tagged. Clustering of the sexes on land could give rise to greater,

possible discrepancies when the numbers tagged are smaller. Tagging of 50,000 pups each year since 1954 has diminished this possible source of error.

The only positive evidence in support of this hypothesis is the pup weighing program undertaken in 1957. In this experiment 1200 pups were weighed and the sex distribution was as follows:

| | Tagged | Percent | Untagged | Percent | Total |
|---|---|---|---|---|---|
| Male | 262 | 57.2 | 391 | 52.7 | 653 |
| Female | 196 | 42.8 | 351 | 47.3 | 547 |
| Total | 458 | | 742 | | 1,200 |

The observed sex ratio among tagged animals is 1.34:1 and among untagged animals 1.11:1. The former is significantly different from a 1:1 ratio ($X^2 = 0.2$ $P < 0.01$) while the latter is not ($X^2 = 2.04$ $P. = .16$).

An excess of males among the tagged pups would mean estimates from male recoveries smaller than the female recovery estimate -- which is the correct direction of the discrepancy of the 1959 estimates of the 1957 year class. Since the 1959 recoveries of J tags (1957) were 7 in number this is very slight supporting evidence.

If this hypothesis is accepted, it is possible to estimate the proportion of males among the tagged animals in 1953 and 1954 and then compute a best common population estimate. Since there is so little direct supporting evidence we raise this as one possibility. Two other possible ways to combine the male and female estimates are to disregard the discrepancy entirely and take the usual weighted mean or alternatively to use an unweighted mean.

We illustrate the procedure to estimate the discrepant sex ratio:

$$\text{Since } N\sigma = \frac{(n\sigma + 1)(t\sigma + 1)}{S\sigma + 1} \qquad N\varphi = \frac{(n\varphi + 1)(t\varphi + 1)}{S\varphi + 1}$$

and for the 1953 year class

$$n\sigma = 48,038 \qquad n\varphi = 11,415$$

$$S\sigma^{\prime} = 766 \qquad S\varphi = 259$$

these estimates are equal if

$$\frac{t\sigma^{\prime}}{t\sigma^{\prime}} + t\varphi = .412$$

or if the tag sex ratio in 1953 was 0.7:1.

The resulting estimate of the 1953 year class is 536,400. Similarly, the 1954 male and female estimates are made identical if the sex ratio among tagged animals that year was 0.66:1 (or the proportion of males tagged was 0.40). Several combined estimates for 1953 and 1954 are shown in table 6.

Table 6. --Combined estimates of 1953-54 year classes (St. Paul pup population at time of tagging)

| Estimates based on recoveries from | Tag series F | Tag series G | Average estimate |
|---|---|---|---|
| Males | 650,000 | 701,900 | |
| Females | 456,200 | 461,100 | |
| Weighted average | 602,000 | 621,000 | 611,500 |
| Unweighted average | 553,400 | 581,500 | 567,400 |
| Best estimate assuming unequal sex ratio among tagged animals | 536,400 | 566,000 | 546,200 |

It is seen that the "best" estimates by each method are consistent between the two year classes. The consistency of the estimates between and within samples from these two year classes had been noted before (Population Report No 4, pp. 77-78). Regardless of which estimate is accepted, it appears that the 1953-54 pup population levels (as of September) were at least 100,000 greater than the average of the years 1949-52.

## 1955 Year Class: H-Tag Series

The H-tag series was the first for which estimates from female recoveries were consistently higher than the estimates from male recoveries. Thus, the combined estimate from male recoveries is 627,800 while that from female recoveries is 776,000. This large difference is not significant, nor is the difference between estimates made for this year class from 1958 and 1959 recoveries. The analysis is similar to that used in Population Report No. 4 -- estimates are computed by round and an analysis of variance performed. The results are shown below.

Table 7. --Analysis of variance of 1958-59 estimates by rounds

| Source of variation | d.f. | H-tag series Sum of squares ($X10^6$) | Mean square ($X10^6$) |
|---|---|---|---|
| Sex | 1 | 70,898.6 | 70,898.6 |
| Year | 1 | 36,787.6 | 36,787.6 |
| Interaction | 1 | 3,165.0 | 3,165.0 |
| Error | 20 | 342,637.1 | 17,136.7 |

F (Sex) = 4.14 P = 0.06

F (Year)= 2.15 P = 0.20

F (Interaction) = 0.18 P = 0.65

The difference between years is not significant but the difference between sexes (i.e. between estimates from male and female recoveries) is almost significant. Thus, it might be suggested that the same procedure be used as with F - G series, i. e., an estimate be made of the original tagged group sex ratio and on this basis the combined estimate be formed. Since the female recovery estimate is larger, the indicated sex ratio among tagged pups is 1.52:1 in favor of males.

The estimate derived from this procedure as well as the weighted and unweighted averages is shown in table 8.

Table 8. --Estimates of the 1955 year class
(St. Paul pup population at time of tagging)

| | | | |
|---|---|---|---|
| From male recoveries | 627,800 | From female recoveries | 776,000 |
| Combined (weighted) estimate | | 665,000 | |
| Combined (unweighted) estimate | | 701,900 | |
| Combined estimate based on assumption that original sex ratio among tagged animals was 1.52:1 | | 694,200 | |

Whichever of these estimates is accepted, it appears that the 1955 pup class represented an increase of at least 100,000 over the year classes of the previous two years.

## 1956 Year Class: I-Tag Series

So far only 91 female tags have been recovered from this class; however, the 1959 estimates (male 827,500; female 882,810) appear to differ by what may be regarded as sampling error.

The male tag return has also been low -- 491 in 1959. Compared to the A, B, and CS tag series, twice as many tags placed resulted in half as many tag returns at age 3. This is associated with the sharp reduction in returns from the 1956 year class, apparently caused by very poor survival.

One further test was made with respect to the 1959 recoveries -- a test of significance between the estimates by rounds of the 1955 and 1956 year classes. The result was $t = 6.41$ (14 d.f.) $P < .01$, i.e., the evidence from male recoveries in 1959 is that the 1956 year class was significantly larger than the 1955 year class. The best estimate for the year class is shown in table 9.

Table 9. --Estimates of the 1956 year class

| | | |
|---|---|---|
| From male recoveries | | 746,100 |
| From female recoveries | | 974,500 |
| Combined (weighted) estimate | = | 777,800 |

## 1957 Year Class: J-Tag Series

The combined estimate for this series is 708,400 based on only the return of 72 tagged animals as 2-year-olds. The reliability of this estimate is very low. For example, the estimate of the 1956 year class from 101 male 2-year-old tag returns was 338,800 or less than half the best estimate based on returns through 1959 given in table 9 above.

## Estimates of the Year Classes at Birth, St. Paul Island

To estimate the original year class sizes it is necessary to add the dead pup counts to the estimates at the time of tagging. This is shown in table 10.

Table 10. --Estimates of year classes 1947-57

| Year class | Best September estimate | Average | Dead pup count | Total (rounded) |
|---|---|---|---|---|
| 1947 | 425,800) | | | |
| 1948 | 468,400) | 454,600 | 50,000 1/ | 500,000 |
| 1949 | 469,600) | | | |
| 1950 | -- | | 55,000 | |
| 1951 | 413,600 | | 74,200 | 490,000 |
| 1952 | 451,500 | | -- | 530,000 2/ |
| 1953 | 536,400 | | 83,200 | 620,000 |
| 1954 | 556,000 | | 101,000 | 660,000 |
| 1955 | 665,000 | | 79,300 | 740,000 |
| 1956 | 777,800 | | 103,600 | 880,000 |
| 1957 | 708,400 | | 64,700 | 770,000 |

1/ Estimated from 1950 count.

2/ Calculated using an average of 1951 and 1953 dead pup counts.

## Returns of Male Seals to Age 4

A key statistic in the population study of the fur seal is the counts of bachelors (subadult males). These are from the commercial harvest and from estimates of escapement. Since the commercial harvest covers predominantly two ages, it is possible to pick either age 3 or 4 as a basis for computing male returns from a given year class. If we were to deal with males alone, age 3 would be the preferable age. However, we wish to use the bachelor count to estimate the returns of females and since young females begin to be recruited into the adult population at age 4 it is convenient to use age 4 as a base age for females. We, therefore, here calculate the returns of males to age 4, adding those killed at age 2 or 3 -- and allowing for natural mortality in these groups harvested before age 4.

To explain the last point the 1,735 two-year-olds taken in 1954 from the 1952 year class would have been exposed to an estimated 8 percent mortality from 1954 to 1955 and an estimated 6 percent mortality from 1955 to 1956 had they not been harvested earlier. Hence, if all "returns" are to be comparable, they must be adjusted to a common reference age. The mortality rates referred to are those given in Kenyon, Scheffer, and Chapman (1954, p. 38).

Table 11. --Adjusted returns of male fur seals on St. Paul Island

| Year class | Harvest | | | Harvest adjusted | | Estimated 4-year escapement | Total adjusted returns (1)+(2)+(3)+(4) |
|---|---|---|---|---|---|---|---|
| | Age 2 | Age 3 | Age 4 (1) | Age 2 (2) | Age 3 (3) | (4) | |
| 1947 | 658[1/] | 31,746 | 19,658 | 569 | 29,841 | 6,139 | 56,207 |
| 1948 | 658[1/] | 30,014 | 17,995 | 569 | 28,213 | 4,903 | 51,680 |
| 1949 | 658[1/] | 29,697 | 12,502 | 569 | 27,915 | 3,904 | 44,890 |
| 1950 | 658[1/] | 40,506 | 15,365 | 569 | 38,076 | 4,798 | 58,808 |
| 1951 | 658[1/] | 32,350 | 18,083 | 569 | 30,409 | 5,647 | 54,708 |
| 1952 | 1,735 | 30,733 | 31,448 | 1,500 | 28,889 | 2,122 | 63,959 |
| 1953 | 839 | 38,290 | 8,855 | 726 | 35,992 | 881 | 46,454 |
| 1954 | 2,858 | 23,473 | 5,599 | 2,472 | 22,064 | 58 | 30,193 |
| 1955 | 1,015 | 27,912 | 10,438 | 878 | 26,237 | ---[2/] | 37,553 |

1/ Detailed estimation of the number of 2-year-olds in the male kill was not always made prior to 1954 and this is an average figure given in Kenyon, Scheffer, and Chapman (1954, p. 17).

2/ 1959 escapement estimate not yet available.

It is of interest to relate returns to the size of the year class from which the returns come. Table 12 below shows the return as a percentage of the September population estimate. On calculating these percentages it is assumed that the original pup classes had a 1:1 sex ratio and thus the original number of male pups was half the indicated September population estimate.

Table 12.--Percentage returns by year class of males at age 4 adjusted for earlier killing, St. Paul Island

| Year class | Adjusted percentage return | September population estimate (males and females) |
|---|---|---|
| 1947 | 26.4 | 425,800 |
| 1948 | 22.1 | 468,400 |
| 1949 | 19.2 | 469,600 |
| 1950 | 26.4 | 445,800 1/ |
| 1951 | 26.5 | 413,600 |
| 1952 | 28.3 | 451,500 |
| 1953 | 17.3 | 536,400 |
| 1954 | 10.8 | 556,000 |
| 1955 | 11.3 | 665,000 |

1/ Estimated from average of tag series A through E (see end of table 5).

Table 9 indicates that increased populations are associated with decreased returns and suggests that the number of pups born in recent years has not been an optimum number. If a line is fitted to returns percentage (P) against the fall population estimate (E) we have the estimated equation

$$P = 58.8 - 0.077\,E$$

where P = percent return to age 4

E = September population in thousands

This equation can be converted to forecast actual returns (N) viz

$$N = .588\,E - .00077\,E^2$$

where N = number of animals returning at age 4 in thousands and it is seen that actual returns are a maximum when the September population is equal to 382,000.

The estimated returns of both sexes for this pup-population level are 112,000; this maximum is quite flat and the estimated returns exceed 108,000 for September populations in the range 300,000 to 460,000.

The percentage return equation and the data to which it is fitted are shown in figure 15. While the results are suggestive, it remains speculative, until the controlling factors are more precisely pinpointed.

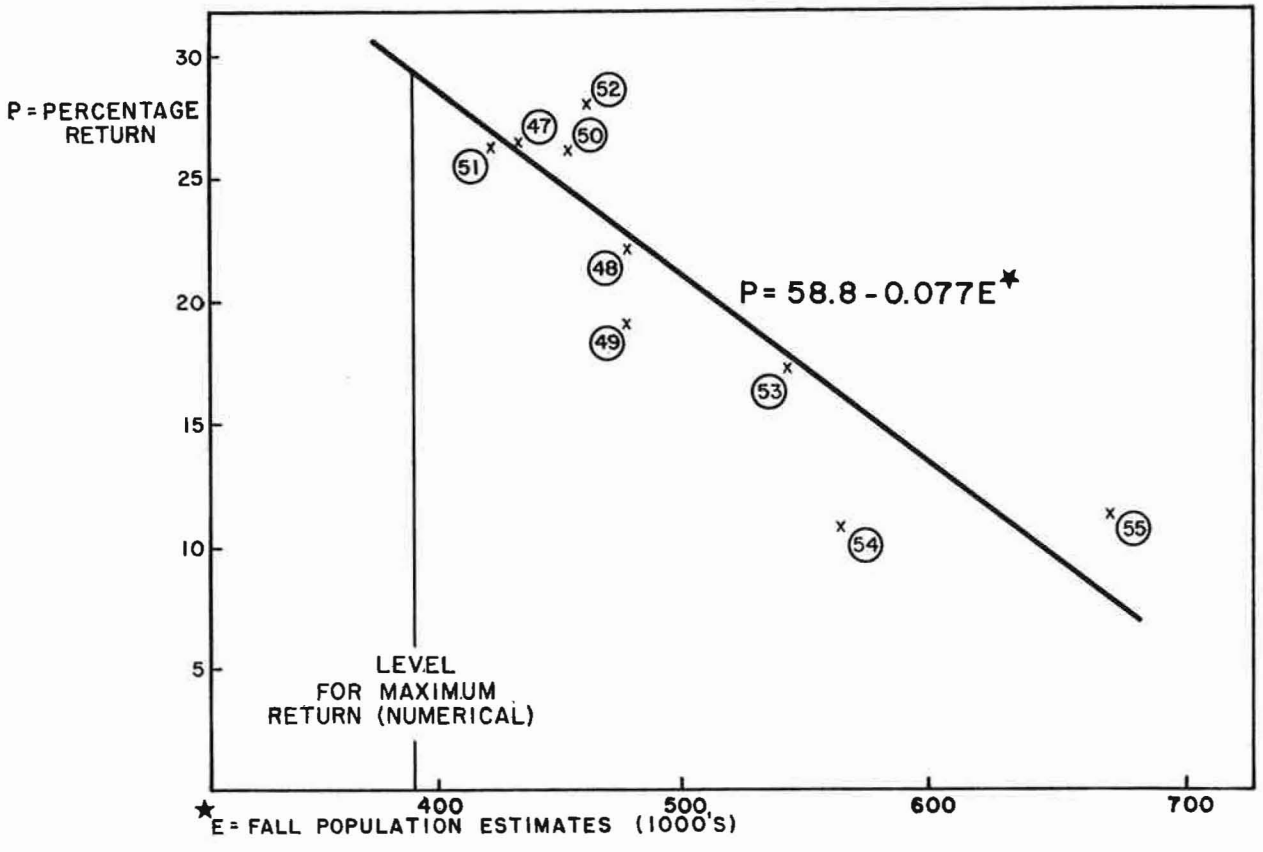


Figure 15. --Percentage returns of males at age 4 vs. fall population estimate, St. Paul Island.

## The Adult Female Population

There are two different methods of estimating the size of this component of the herd.

(1) Using the assumption that males and females return in equal numbers at age 4 (except for differential kill by man) the male returns of table 9 provide an estimate of female recruitment. Thus, the several year classes can be added, after adjustment for natural mortality, to give an estimate of the total number of adult females.

(2) Using the estimates of the number of pups born together with the estimated pregnancy rate it is straightforward to compute the total number of females though no age breakdown is given by this method.

Unfortunately, as will be seen, these methods give divergent results. We consider now the results by the two methods.

Method 1. No newer female mortality rates are available than those used in Kenyon, Scheffer and Chapman (1954). It is known that the female harvest on land is subject to selection and apparently the same was true of the 1958 pelagic sample for the age frequency increased to age 12.

The estimates obtained using method 1 are low in comparison with those by method 2. Yet, the mortality rates used are certainly minimal -- only 5 percent per year from ages 4 to 10. The return data of table 9 and these mortality rates yield the following estimates of the components and the total of the 1956 female population 4 and older:

| | | | |
|---|---|---|---|
| 4-year-olds | 1952 year class return | | = 63,959 |
| 5 " " | 1951 " " " | $\times (0.95)$ | = 52,254 |
| 6 " " | 1950 " " " | $\times (0.95)^2$ | = 53,341 |
| 7 " " | 1949 " " " | $\times (0.95)^3$ | = 38,742 |
| 8 " " | 1948 " " " | $\times (0.95)^4$ | = 42,334 |
| 9 " " | 1947 " " " | $\times (0.95)^5$ | = 43,722 |
| 10 " " and older | 1939-49 average kill | $\times (6.67)$ | = 357,999 |
| | | Total | 652,351 |

Proceeding in a similar manner, we have the following estimate of the 1959 female population (4 and older).

| | | | |
|---|---|---|---|
| 4-year-olds | 1955 year class return | | = 37,553 |
| 5 " " | 1954 " " " | x (0.95) | = 28,683 |
| 6 " " | 1953 " " " | $x (0.95)^2$ | = 41,925 |
| 7 " " | 1952 " " " | $x (0.95)^3$ | = 54,838 |
| 8 " " | 1951 " " " | $x (0.95)^4$ | = 44,801 |
| 9 " " | 1950 " " " | $x (0.95)^6$ | = 45,735 |
| 10 " " and older | average of 1942-49 year kill plus 1947-49 year class return | x (6.67) | = 342,871 |
| | | | 596,406 |
| Less kill of females 1956-59 (102,742 = total kill less kill of 2-year-olds in 1958; 2- and 3-year-olds in 1959) | | | 102,742 |
| | | Total | 493,664 |

Therefore, using male returns as a basis of estimates, the 1959 female population numbers approximately 490,000, down about 160,000 from the high point before female killing began. If returns of 55,000 animals were sufficient to maintain the breeding herd of 650,000 then 75 percent of this number should maintain the breeding herd of 490,000 females. If the returns from this reduced herd and hence reduced pup crop do behave as indicated by the present available data then this suggests a continuing surplus of about 14,000 females (on St. Paul Island).

It is seen that the estimates of the adult female population by method 1 give numbers which are below the estimated number of pups born in each year since 1954. Recalling that the pregnancy rate is far below 100 percent for the $4^+$ females the actual discrepancy is even larger. Consequently, if this estimate of the females is accepted, the recent estimates of the pup population have to be discarded.

Turning to method 2, we face two problems: (1) how was this large number of females recruited? (2) how to explain the wide variations in the size of the pup classes in recent years?

An answer to the first problem is that males and females do not return in equal numbers but that females survive in greater numbers. While this is a possibility it is purely speculative at present.

The second question can be answered by assuming there are large variations in the pregnancy rate from year to year. The greatest variation so far observed is the difference observed in the Japanese and North American pelagic samples of 1952 (.80 vs .66 on the basis of weighted samples). The difference between North American pelagic samples in 1952 and 1958 was much smaller (.66 vs .70). It may be seen that the lower the estimated pregnancy rate, the greater the estimated number of adult females and the greater the discrepancy between the estimates by methods 1 and 2.

Taking the highest pregnancy rate so far observed (0.80) and the largest population estimate based on essentially complete returns (through age 4), the 1955 population estimate of 740,000 pups at birth, implies a total of at least 925,000 females. The 1952 pup estimate (530,000) and the 1952 pregnancy rate (0.66) imply a total of 800,000 females.

We do not have as yet a pup population estimate to use with the 1958 pelagic sample pregnancy rate.

If we accept the pup population estimates we must also accept the estimate that the 1955 female population was 925,000 or more. Since then, 102,742 animals 4-years-old or over in 1959 have been killed and there has been a loss due to the reduced year classes. If females do return in larger numbers than males, the latter loss may amount to 75,000.

Hence, if the tagging estimates are accepted, the present minimum female population size is

925,000 - 75,000 - 103,000 = 750,000 approximately

If this is close to actuality, further pruning of females is desirable -- 750,000 adult females, with only a 0.70 pregnancy rate will produce 525,000 pups a year which appears to be in excess of the optimum number. Hence, if this method is accepted, the suggested procedure for 1960 would be a kill of the same magnitude as in 1958-59, i.e., about 24,000.

# Appendix C

## Appendix table 1.

Age classification of male seals in commercial kill, St. Paul Island, 27 June to 20 August 1959

| Date | Rookery | Males killed | Tooth sample size | Percent in each age class | | | | | Estimated number killed from age class | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 3 | 4 | 5 | 6 | 2 | 3 | 4 | 5 | 6 |
| 27 June | NEP | 570 | 57 | 2 | 23 | 72 | 3 | - | 11 | 132 | 410 | 17 | - |
| 28 | TLK | 198 | 20 | - | 25 | 65 | 10 | - | - | 50 | 128 | 20 | - |
| 29 | ZAP | 956 | 93 | 5 | 28 | 63 | 4 | - | 48 | 268 | 602 | 38 | - |
| 30 | REEF | 142 | 14 | - | 14 | 65 | 21 | - | - | 20 | 92 | 30 | - |
| 1 July | POL | 367 | 38 | - | 31 | 66 | 3 | - | - | 114 | 242 | 11 | - |
| Round total | | 2233 | 222 | - | - | - | - | - | 59 | 584 | 1474 | 116 | - |
| 2 July | NEP | 582 | 58 | - | 24 | 76 | - | - | - | 140 | 442 | - | - |
| 3 | TLK | 356 | 34 | - | 26 | 74 | - | - | - | 92 | 264 | - | - |
| 4 | ZAP | 947 | 96 | 2 | 41 | 53 | 4 | - | 19 | 388 | 502 | 38 | - |
| 5 | REEF | 104 | 11 | - | 18 | 73 | 9 | - | - | 19 | 76 | 9 | - |
| 6 | POL | 428 | 43 | - | 33 | 63 | 4 | - | - | 141 | 270 | 17 | - |
| Round total | | 2417 | 242 | - | - | - | - | - | 19 | 780 | 1554 | 64 | - |
| 7 July | NEP | 640 | 67 | 3 | 49 | 48 | - | - | 19 | 314 | 307 | - | - |
| 8 | TLK | 248 | 24 | - | 29 | 67 | 4 | - | - | 72 | 166 | 10 | - |
| 9 | ZAP | 1553 | 158 | 1 | 45 | 48 | 6 | - | 16 | 699 | 745 | 93 | - |
| 10 | REEF | 123 | 13 | - | 23 | 77 | - | - | - | 28 | 95 | - | - |
| 11 | POL | 492 | 56 | 2 | 30 | 66 | 2 | - | 10 | 148 | 324 | 10 | - |
| Round total | | 3056 | 318 | - | - | - | - | - | 45 | 1261 | 1637 | 113 | - |
| 12 July | NEP | 819 | 84 | - | 45 | 51 | 4 | - | - | 368 | 418 | 33 | - |
| 13 | TLK | 242 | 27 | 4 | 29 | 63 | 4 | - | 10 | 70 | 152 | 10 | - |
| 14 | ZAP | 1663 | 169 | - | 55 | 42 | 3 | - | - | 915 | 698 | 50 | - |
| 15 | REEF | 190 | 19 | - | 47 | 53 | - | - | - | 89 | 101 | - | - |
| 16 | POL | 583 | 52 | 4 | 21 | 67 | 8 | - | 23 | 122 | 391 | 47 | - |
| Round total | | 3497 | 351 | - | - | - | - | - | 33 | 1564 | 1760 | 140 | - |
| 17 July | NEP | 901 | 92 | 2 | 44 | 51 | 3 | - | 18 | 396 | 460 | 27 | - |
| 18 | TLK | 366 | 37 | 3 | 38 | 59 | - | - | 11 | 139 | 216 | - | - |
| 19 | ZAP | 1543 | 137 | 5 | 66 | 29 | - | - | 77 | 1018 | 448 | - | - |
| 20 | REEF | 151 | 16 | - | 6 | 82 | 6 | 6 | - | 9 | 124 | 9 | 9 |
| 21 | POL | 650 | 66 | 5 | 53 | 42 | - | - | 29 | 345 | 276 | - | - |
| Round total | | 3611 | 348 | - | - | - | - | - | 135 | 1907 | 1524 | 36 | 9 |
| 22 July | NEP | 926 | 93 | 5 | 55 | 40 | - | - | 46 | 509 | 371 | - | - |
| 23 | TLK | 390 | 39 | 2 | 44 | 52 | 2 | - | 8 | 172 | 202 | 8 | - |
| 24 | ZAP | 1981 | 199 | 4 | 56 | 39 | 1 | - | 79 | 1109 | 773 | 20 | - |
| 25 | REEF | 271 | 30 | - | 30 | 63 | 7 | - | - | 81 | 171 | 19 | - |
| 26 | POL | 654 | 67 | 4 | 55 | 39 | 2 | - | 26 | 360 | 255 | 13 | - |
| Round total | | 4222 | 428 | - | - | - | - | - | 159 | 2231 | 1772 | 60 | - |
| 27 July | NEP | 1208 | 118 | 9 | 60 | 29 | 2 | - | 109 | 725 | 350 | 24 | - |
| 28 | TLK | 495 | 37 | 13 | 65 | 22 | - | - | 64 | 322 | 109 | - | - |
| 29 | ZAP | 1067 | 107 | 31 | 56 | 13 | - | - | 331 | 598 | 138 | - | - |
| 30 | REEF | 184 | 20 | 35 | 55 | 10 | - | - | 65 | 101 | 18 | - | - |
| 31 | POL | 296 | 32 | 19 | 44 | 37 | - | - | 56 | 130 | 110 | - | - |
| Round total | | 3250 | 314 | - | - | - | - | - | 625 | 1876 | 725 | 24 | - |
| 1 August | NEP | 19 | 17 | 21 | 63 | 16 | - | - | 4 | 12 | 3 | - | - |
| 2 | TLK | 9 | 9 | 22 | 45 | 22 | 11 | - | 2 | 4 | 2 | 1 | - |
| 3 | ZAP | 54 | 38 | 32 | 60 | 8 | - | - | 17 | 33 | 4 | - | - |
| 4 | REEF | 2 | - | - | - | - | - | - | 1 | 1 | - | - | - |
| 5 | POL | 20 | 4 | 25 | 50 | 25 | - | - | 5 | 10 | 5 | - | - |
| Round total | | 104 | 68 | - | - | - | - | - | 29 | 60 | 14 | 1 | - |
| 6 August | NEP | 94 | 35 | 60 | 28 | 12 | - | - | 57 | 26 | 11 | - | - |
| 7 | TLK | 66 | 10 | 67 | 22 | 11 | - | - | 44 | 15 | 7 | - | - |
| 8 | ZAP | 82 | 10 | 90 | 10 | - | - | - | 74 | 8 | - | - | - |
| 9 | REEF | 17 | 4 | 50 | 25 | 25 | - | - | 9 | 4 | 4 | - | - |
| 10 | POL | 39 | 4 | 75 | 25 | - | - | - | 29 | 10 | - | - | - |
| Round total | | 298 | 63 | - | - | - | - | - | 213 | 63 | 22 | - | - |
| 11 August | NEP | 384 | 26 | 58 | 23 | 12 | - | - | 223 | 88 | 46 | - | - |
| 12 | TLK | 44 | 6 | 83 | - | - | - | - | 36 | - | - | - | - |
| 13 | ZAP | 266 | 14 | 64 | 29 | - | - | - | 170 | 77 | - | - | - |
| 14 | REEF | 36 | - | 89 | - | - | - | - | 32 | - | - | - | - |
| 15 | POL | 205 | 16 | 81 | - | - | - | - | 166 | - | - | - | - |
| Round total | | 935 | 62 | - | - | - | - | - | 627 | 165 | 46 | - | - |
| 16 August | NEP | 278 | 14 | 86 | 7 | - | - | - | 240 | 19 | - | - | - |
| 17 | TLK | 182 | 27 | 59 | 26 | 15 | - | - | 108 | 47 | 27 | - | - |
| 18 | ZAP | 126 | - | 69 | 31 | - | - | - | 87 | 39 | - | - | - |
| 19 | REEF | 72 | 9 | 67 | 33 | - | - | - | 48 | 24 | - | - | - |
| 20 | POL | 214 | - | 76 | 24 | - | - | - | 163 | 51 | - | - | - |
| Round total | | 872 | 50 | - | - | - | - | - | 646 | 180 | 27 | - | - |
| Season total | | 24495[1/] | 2466 | - | - | - | - | - | 2590 | 10671 | 10555 | 554 | 9 |

1/ Includes 116 one-year-old seals.

# Appendix table 2.

**Cumulative age classification of male seals in commercial kill, by day, St. Paul Island, 27 June to 20 August 1959**

| Date | Rookery | Estimated kill from each age class | | | | | Total kill | Percent kill from each age class | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | | 2 | 3 | 4 | 5 | 6 |
| 27 June | NEP | 11 | 132 | 410 | 17 | - | 570 | 2 | 23 | 72 | 3 | - |
| 28 | TLK | 11 | 182 | 538 | 37 | - | 768 | 1 | 24 | 70 | 5 | - |
| 29 | ZAP | 59 | 450 | 1140 | 75 | - | 1724 | 3 | 26 | 66 | 5 | - |
| 30 | REEF | 59 | 470 | 1232 | 105 | - | 1866 | 3 | 25 | 66 | 6 | - |
| 1 July | POL | 59 | 584 | 1474 | 116 | - | 2233 | 3 | 26 | 66 | 5 | - |
| 2 | NEP | 59 | 724 | 1916 | 116 | - | 2815 | 2 | 26 | 68 | 4 | - |
| 3 | TLK | 59 | 816 | 2180 | 116 | - | 3171 | 2 | 26 | 68 | 4 | - |
| 4 | ZAP | 78 | 1204 | 2682 | 154 | - | 4118 | 2 | 29 | 65 | 4 | - |
| 5 | REEF | 78 | 1223 | 2758 | 163 | - | 4222 | 2 | 29 | 65 | 4 | - |
| 6 | POL | 78 | 1364 | 3028 | 180 | - | 4650 | 2 | 29 | 65 | 4 | - |
| 7 | NEP | 97 | 1678 | 3335 | 180 | - | 5290 | 2 | 32 | 63 | 3 | - |
| 8 | TLK | 97 | 1750 | 3501 | 190 | - | 5538 | 2 | 31 | 63 | 4 | - |
| 9 | ZAP | 113 | 2449 | 4246 | 283 | - | 7091 | 2 | 34 | 60 | 4 | - |
| 10 | REEF | 113 | 2477 | 4341 | 283 | - | 7214 | 2 | 34 | 60 | 4 | - |
| 11 | POL | 123 | 2625 | 4665 | 293 | - | 7706 | 2 | 34 | 60 | 4 | - |
| 12 | NEP | 123 | 2993 | 5083 | 326 | - | 8525 | 2 | 35 | 60 | 3 | - |
| 13 | TLK | 133 | 3063 | 5235 | 336 | - | 8767 | 2 | 35 | 60 | 3 | - |
| 14 | ZAP | 133 | 3978 | 5933 | 386 | - | 10430 | 1 | 38 | 57 | 4 | - |
| 15 | REEF | 133 | 4067 | 6034 | 386 | - | 10620 | 1 | 38 | 57 | 4 | - |
| 16 | POL | 156 | 4189 | 6425 | 433 | - | 11203 | 2 | 37 | 57 | 4 | - |
| 17 | NEP | 174 | 4585 | 6885 | 460 | - | 12104 | 1 | 38 | 57 | 4 | - |
| 18 | TLK | 185 | 4724 | 7101 | 460 | - | 12470 | 1 | 38 | 57 | 4 | - |
| 19 | ZAP | 262 | 5742 | 7549 | 460 | - | 14013 | 2 | 41 | 54 | 3 | - |
| 20 | REEF | 262 | 5751 | 7673 | 469 | 9 | 14164 | 2 | 41 | 54 | 3 | <1 |
| 21 | POL | 291 | 6096 | 7949 | 469 | 9 | 14814 | 2 | 41 | 54 | 3 | <1 |
| 22 | NEP | 337 | 6605 | 8320 | 469 | 9 | 15740 | 2 | 42 | 53 | 3 | <1 |
| 23 | TLK | 345 | 6777 | 8522 | 477 | 9 | 16130 | 2 | 42 | 53 | 3 | <1 |
| 24 | ZAP | 424 | 7886 | 9295 | 497 | 9 | 18111 | 2 | 44 | 51 | 3 | <1 |
| 25 | REEF | 424 | 7967 | 9466 | 516 | 9 | 18382 | 2 | 43 | 52 | 3 | <1 |
| 26 | POL | 450 | 8327 | 9721 | 529 | 9 | 19036 | 2 | 44 | 51 | 3 | <1 |
| 27 | NEP | 559 | 9052 | 10071 | 553 | 9 | 20244 | 2 | 45 | 50 | 3 | <1 |
| 28 | TLK | 623 | 9374 | 10180 | 553 | 9 | 20739 | 3 | 45 | 49 | 3 | <1 |
| 29 | ZAP | 954 | 9972 | 10318 | 553 | 9 | 21806 | 4 | 46 | 47 | 3 | <1 |
| 30 | REEF | 1019 | 10073 | 10336 | 553 | 9 | 21990 | 5 | 46 | 47 | 2 | <1 |
| 31 | POL | 1075 | 10203 | 10446 | 553 | 9 | 22286 | 5 | 46 | 47 | 2 | <1 |
| 1 August | NEP | 1079 | 10215 | 10449 | 553 | 9 | 22305 | 5 | 46 | 47 | 2 | <1 |
| 2 | TLK | 1081 | 10219 | 10451 | 554 | 9 | 22314 | 5 | 46 | 47 | 2 | <1 |
| 3 | ZAP | 1098 | 10252 | 10455 | 554 | 9 | 22368 | 5 | 46 | 47 | 2 | <1 |
| 4 | REEF | 1099 | 10253 | 10455 | 554 | 9 | 22370 | 5 | 46 | 47 | 2 | <1 |
| 5 | POL | 1104 | 10263 | 10460 | 554 | 9 | 22390 | 5 | 46 | 47 | 2 | <1 |
| 6 | NEP | 1161 | 10289 | 10471 | 554 | 9 | 22484 | 5 | 46 | 47 | 2 | <1 |
| 7 | TLK | 1205 | 10304 | 10478 | 554 | 9 | 22550 | 5 | 46 | 47 | 2 | <1 |
| 8 | ZAP | 1279 | 10312 | 10478 | 554 | 9 | 22632 | 5 | 46 | 47 | 2 | <1 |
| 9 | REEF | 1288 | 10316 | 10482 | 554 | 9 | 22649 | 6 | 46 | 46 | 2 | <1 |
| 10 | POL | 1317 | 10326 | 10482 | 554 | 9 | 22688 | 6 | 46 | 46 | 2 | <1 |
| 11 | NEP | 1540 | 10414 | 10528 | 554 | 9 | 23072 | 7 | 45 | 46 | 2 | <1 |
| 12 | TLK | 1576 | 10414 | 10528 | 554 | 9 | 23116 | 7 | 45 | 46 | 2 | <1 |
| 13 | ZAP | 1746 | 10491 | 10528 | 554 | 9 | 23382 | 7 | 45 | 46 | 2 | <1 |
| 14 | REEF | 1778 | 10491 | 10528 | 554 | 9 | 23418 | 8 | 45 | 45 | 2 | <1 |
| 15 | POL | 1944 | 10491 | 10528 | 554 | 9 | 23623 | 8 | 45 | 45 | 2 | <1 |
| 16 | NEP | 2184 | 10510 | 10528 | 554 | 9 | 23901 | 9 | 44 | 44 | 2 | <1 |
| 17 | TLK | 2292 | 10557 | 10555 | 554 | 9 | 24083 | 9 | 44 | 44 | 2 | <1 |
| 18 | ZAP | 2379 | 10596 | 10555 | 554 | 9 | 24209 | 10 | 44 | 44 | 2 | <1 |
| 19 | REEF | 2427 | 10620 | 10555 | 554 | 9 | 24281 | 10 | 44 | 44 | 2 | <1 |
| 20 | POL | 2590 | 10671 | 10555 | 554 | 9 | 24495 1/ | 10 | 44 | 44 | 2 | <1 |

1/ Includes 116 one-year-old seals.

# Appendix table 3.

Reproductive condition of female seals sampled from commercial kill, by date and age, St. Paul Island, 27 June to 20 August 1959

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 27 June | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 2 | 1 | - | - | - | - | - | 4 |
| nonpregnant | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 2 | - | - | - | - | 3 |
| 1 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| 2 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 3 | 1 | - | - | - | 4 |
| 3 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 1 | - | - | 1 | - | 3 |
| 4 July | | | | | | | | | | | |
| Primpara | | | | | | | | | | | |
| pregnant | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 1 | 1 | - | - | - | - | 3 |
| 6 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | - | - | - | 1 | 1 | 2 |
| 7 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | 1 | - | - | - | - | - | - | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 1 | 1 | 1 | - | 1 | 5 |
| 8 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 1 | - | - | - | - | - | 2 |
| 9 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| 11 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | 1 | - | - | - | - | 2 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| nonpregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 12 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 3 | 4 | 1 | - | 1 | - | - | 9 |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | - | - | - | 1 | - | 2 |
| nonpregnant | - | - | - | - | - | - | - | - | 1 | - | 1 |
| 13 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| 14 July | | | | | | | | | | | |
| Nullipara | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | - | 4 | 2 | 1 | - | 1 | - | 9 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | 1 | - | 1 | 1 | - | - | 1 | 2 | 6 |
| nonpregnant | - | - | - | - | - | - | - | - | - | 2 | 2 |
| 17 July | | | | | | | | | | | |
| Nullipara | - | - | 1 | - | - | - | - | - | 1 | - | 2 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | - | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | - | 1 | 1 | - | 1 | 4 |
| nonpregnant | - | - | - | - | - | - | - | - | - | 2 | 2 |
| 18 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | 2 | 2 | - | - | - | - | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 1 | - | 1 | 1 | 2 | 5 |
| nonpregnant | - | - | - | - | - | - | - | - | 1 | 2 | 3 |

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 19 July | | | | | | | | | | | |
| Nullipara | - | - | - | 1 | 1 | - | - | - | - | - | 2 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 4 | 7 | 1 | - | - | - | - | 12 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | 2 | 1 | 3 | 3 | 6 | 16 |
| nonpregnant | - | - | - | - | - | 1 | - | 1 | - | 12 | 14 |
| 20 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | 1 | - | - | - | - | 2 |
| 21 July | | | | | | | | | | | |
| Nullipara | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 2 | 1 | - | - | - | - | 4 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 1 | - | 1 | - | - | 2 |
| nonpregnant | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 22 July | | | | | | | | | | | |
| Nullipara | - | - | 1 | 2 | 1 | - | 1 | - | - | - | 5 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 4 | 6 | 2 | 1 | - | - | - | 13 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 2 | 1 | 1 | 1 | 1 | 7 |
| nonpregnant | - | - | - | - | - | - | - | 1 | - | 1 | 2 |
| 23 July | | | | | | | | | | | |
| Nullipara | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 3 | 1 | - | - | - | - | - | 4 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 1 | 1 | 1 | - | - | 4 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | 2 | 3 |
| 24 July | | | | | | | | | | | |
| Nullipara | - | - | 3 | 2 | - | - | - | - | - | - | 5 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | 9 | 4 | 1 | 1 | 1 | - | - | 18 |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 4 | 14 |
| nonpregnant | - | - | - | - | 1 | 1 | 3 | 3 | 2 | 13 | 23 |
| 25 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | - | 1 | - | - | - | 1 |
| 26 July | | | | | | | | | | | |
| Nullipara | - | - | 2 | - | 2 | 1 | - | - | - | - | 5 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 3 | 7 | 1 | 1 | - | - | - | - | 12 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 27 July | | | | | | | | | | | |
| Nullipara | - | - | 3 | 1 | 1 | 1 | - | - | - | - | 6 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 2 | 1 | - | - | 1 | 1 | - | 6 |
| Multipara | | | | | | | | | | | |
| nonpregnant | - | - | - | - | - | - | - | 1 | - | 1 | 2 |
| 28 July | | | | | | | | | | | |
| Nullipara | - | 1 | 6 | 3 | - | 2 | - | - | - | - | 12 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 18 | 4 | 7 | 3 | 2 | - | - | 34 |
| nonpregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 3 | 6 | 1 | 1 | 3 | 7 | 22 |
| nonpregnant | - | - | - | - | 1 | 1 | 1 | 2 | 4 | 20 | 29 |
| 29 July | | | | | | | | | | | |
| Nullipara | - | 1 | 5 | 1 | - | - | - | - | - | - | 7 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 3 | 2 | - | - | - | - | - | - | 5 |
| nonpregnant | - | - | - | 1 | 1 | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 1 | 4 | - | - | 3 | 8 |
| nonpregnant | - | - | - | - | - | - | 2 | 1 | 1 | 3 | 7 |
| 30 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| nonpregnant | - | - | - | - | - | - | - | 1 | - | 1 | 2 |

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 31 July | | | | | | | | | | | |
| Nullipara | - | - | 6 | 3 | 2 | 1 | - | 1 | - | - | 13 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 5 | - | - | - | - | 1 | - | 7 |
| nonpregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 2 | - | 1 | - | 1 | 4 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | 5 | 6 |
| 1 August | | | | | | | | | | | |
| Nullipara | - | - | 9 | 4 | 3 | 2 | - | - | 1 | - | 19 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 4 | 2 | 5 | 2 | - | - | - | 13 |
| nonpregnant | - | - | - | - | 1 | 1 | - | - | - | 1 | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 4 | 6 | 2 | 2 | 4 | 6 | 25 |
| nonpregnant | - | - | 1 | - | - | 3 | 1 | 1 | 2 | 9 | 17 |
| 2 August | | | | | | | | | | | |
| Nullipara | - | - | 6 | 2 | 3 | - | - | - | - | - | 11 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 6 | 2 | - | - | - | - | - | 9 |
| nonpregnant | - | - | - | - | 2 | 1 | - | 2 | - | 1 | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 2 | 1 | 1 | 2 | - | 1 | 7 |
| nonpregnant | - | - | - | - | 1 | 1 | 2 | 1 | 2 | 5 | 12 |
| 3 August | | | | | | | | | | | |
| Nullipara | - | 3 | 20 | 5 | 1 | 1 | - | - | - | 1 | 31 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 8 | 10 | 11 | 1 | 1 | - | - | - | 31 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | 4 | 3 | 5 | 2 | - | 8 | 24 |
| nonpregnant | - | - | - | 2 | 2 | 6 | 3 | 6 | 3 | 19 | 41 |
| 4 August | | | | | | | | | | | |
| Nullipara | - | - | 5 | - | - | - | - | - | - | - | 5 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 1 | 1 | - | - | - | - | - | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 8 |
| nonpregnant | - | - | - | - | - | 1 | 1 | 2 | 1 | 2 | 7 |
| 5 August | | | | | | | | | | | |
| Nullipara | - | 1 | 11 | 3 | 2 | - | - | - | - | - | 17 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 4 | 4 | 1 | - | - | - | - | - | 9 |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 3 | 2 | 6 | 4 | 3 | 1 | 7 | 26 |
| nonpregnant | - | - | - | 1 | 1 | 3 | 4 | 1 | 1 | 6 | 17 |
| 6 August | | | | | | | | | | | |
| Nullipara | - | 4 | 38 | 10 | 2 | 6 | - | - | - | 1 | 61 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | 14 | 6 | 6 | 3 | - | - | - | 31 |
| nonpregnant | - | - | 1 | 2 | - | 1 | 1 | - | - | 1 | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 4 | 11 | 6 | 2 | 5 | 7 | 36 |
| nonpregnant | - | - | - | - | 8 | 16 | 11 | 7 | 6 | 21 | 69 |
| 7 August | | | | | | | | | | | |
| Nullipara | - | 5 | 29 | 14 | 2 | 2 | 2 | - | - | - | 54 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 7 | 13 | 8 | 5 | - | - | - | - | 33 |
| nonpregnant | - | - | - | 1 | 3 | - | 1 | - | - | - | 5 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 5 | 5 | 7 | 3 | 5 | 5 | 31 |
| nonpregnant | - | - | - | - | 2 | 7 | 3 | 9 | 4 | 16 | 41 |
| 8 August | | | | | | | | | | | |
| Nullipara | - | 14 | 61 | 23 | 8 | 4 | 1 | - | 1 | 1 | 113 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 12 | 25 | 7 | 3 | 2 | - | - | - | 49 |
| nonpregnant | - | - | 1 | 3 | 4 | 1 | - | - | - | - | 9 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 4 | 8 | 6 | 1 | 3 | 11 | 34 |
| nonpregnant | - | - | - | 3 | 4 | 8 | 5 | 9 | 7 | 20 | 56 |
| 9 August | | | | | | | | | | | |
| Nullipara | - | 3 | 10 | 1 | 1 | 1 | - | - | - | - | 16 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | 2 | 1 | 1 | - | - | - | - | 6 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 2 | 5 | 2 | 1 | 12 | 23 |
| nonpregnant | - | - | - | - | - | 6 | 5 | 3 | 1 | 4 | 19 |

# Appendix table 3 (con.)

Reproductive condition of female seals sampled from commercial kill, by date and age, St. Paul Island, 27 June to 20 August 1959

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 10 August | | | | | | | | | | | |
| Nullipara | 1 | 9 | 28 | 5 | 3 | - | - | - | - | - | 46 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 8 | 10 | 4 | 1 | - | - | - | - | 23 |
| nonpregnant | - | - | - | 2 | - | 1 | - | - | - | - | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 4 | 12 | 10 | 4 | 1 | 12 | 44 |
| nonpregnant | - | - | - | - | 11 | 5 | 5 | 4 | 3 | 21 | 49 |
| 11 August | | | | | | | | | | | |
| Nullipara | - | 22 | 42 | 11 | 8 | 7 | - | 1 | - | 2 | 93 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 9 | 25 | 17 | 14 | 3 | 4 | 1 | 1 | 74 |
| nonpregnant | - | - | - | - | 3 | 11 | - | 1 | - | - | 15 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 11 | 14 | 10 | 9 | 10 | 34 | 89 |
| nonpregnant | - | - | - | 1 | 9 | 11 | 11 | 10 | 12 | 77 | 131 |
| 12 August | | | | | | | | | | | |
| Nullipara | - | 12 | 33 | 8 | 1 | 2 | - | - | - | 1 | 57 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 3 | 4 | 3 | 2 | - | - | - | 1 | 13 |
| nonpregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 2 | 6 | 2 | - | 1 | 4 | 16 |
| nonpregnant | - | - | - | - | 1 | 3 | - | 2 | 3 | 4 | 13 |
| 13 August | | | | | | | | | | | |
| Nullipara | 6 | 37 | 93 | 13 | 3 | 1 | 1 | - | - | - | 154 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 12 | 13 | 8 | 3 | 1 | - | - | - | 37 |
| nonpregnant | - | - | - | 2 | 6 | 1 | 1 | - | - | - | 10 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 3 | 8 | 4 | 2 | 3 | 1 | 10 | 31 |
| nonpregnant | - | - | - | 1 | 5 | 4 | 5 | 5 | 1 | 14 | 35 |
| 14 August | | | | | | | | | | | |
| Nullipara | 1 | 10 | 52 | 12 | 5 | - | - | - | - | - | 80 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 9 | 12 | 5 | 1 | 2 | - | - | 1 | 30 |
| nonpregnant | - | - | - | - | 2 | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | 5 | 10 | 8 | 3 | 3 | 9 | 40 |
| nonpregnant | - | - | 1 | - | 9 | 5 | 7 | 2 | 3 | 5 | 32 |

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 15 August | | | | | | | | | | | |
| Nullipara | 3 | 20 | 63 | 11 | 3 | 8 | 1 | - | 1 | 1 | 111 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 11 | 15 | 9 | 9 | 1 | - | - | - | 45 |
| nonpregnant | - | - | - | 1 | 1 | 2 | 1 | - | - | - | 5 |
| Multipara | | | | | | | | | | | |
| pregnant | - | 1 | - | 2 | 2 | 22 | 5 | 4 | 3 | 24 | 63 |
| nonpregnant | - | - | - | 1 | 1 | 8 | 6 | 2 | 6 | 33 | 57 |
| 16 August | | | | | | | | | | | |
| Nullipara | 7 | 33 | 90 | 21 | 4 | 1 | - | - | 1 | - | 157 |
| Primipara | | | | | | | | | | | |
| pregnant | - | 1 | 13 | 24 | 8 | 4 | 3 | - | - | - | 53 |
| nonpregnant | - | - | 2 | 2 | 1 | 4 | - | - | - | - | 9 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | 6 | 12 | 4 | 3 | 3 | 6 | 36 |
| nonpregnant | - | - | - | - | 4 | 11 | 7 | 6 | 5 | 14 | 47 |
| 17 August | | | | | | | | | | | |
| Nullipara | - | 18 | 49 | 13 | 2 | 1 | 2 | - | - | 1 | 86 |
| Primipara | | | | | | | | | | | |
| pregnant | - | 1 | 8 | 6 | 6 | 6 | - | - | - | - | 27 |
| nonpregnant | - | - | 1 | 2 | 1 | 2 | 1 | 1 | - | - | 8 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 4 | 5 | 7 | 4 | 1 | 5 | 12 | 38 |
| nonpregnant | - | - | 1 | 2 | 3 | 3 | 4 | 3 | 1 | 17 | 34 |
| 18 August | | | | | | | | | | | |
| Nullipara | 3 | 10 | 33 | 4 | - | - | - | - | - | - | 50 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 4 | 8 | 2 | 3 | - | - | - | - | 17 |
| nonpregnant | - | - | - | 2 | 1 | - | 1 | - | - | - | 4 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 5 | - | 2 | 2 | 1 | 21 | 31 |
| nonpregnant | - | - | - | 2 | 1 | 5 | 6 | 3 | 2 | 17 | 36 |
| 19 August | | | | | | | | | | | |
| Nullipara | 1 | 27 | 52 | 6 | 8 | 3 | - | 1 | - | 1 | 99 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 9 | 13 | 8 | 4 | 1 | 2 | 1 | - | 38 |
| nonpregnant | - | - | 2 | 2 | - | - | - | - | - | - | 4 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 1 | 6 | 3 | 4 | 1 | 2 | 23 | 41 |
| nonpregnant | - | - | - | 1 | 4 | 4 | 5 | 4 | 1 | 33 | 52 |

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 20 August | | | | | | | | | | | |
| Nullipara | 8 | 24 | 69 | 7 | - | 2 | - | - | - | - | 110 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 6 | 13 | 8 | 2 | - | - | - | - | 29 |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 3 | 4 | 12 | 8 | 2 | 2 | 24 | 55 |
| nonpregnant | - | - | - | 2 | 4 | 10 | 5 | - | 1 | 13 | 35 |
| Total | 30 | 257 | 978 | 551 | 429 | 467 | 253 | 171 | 152 | 696 1/ | 3984 |

1/ Includes: 29 known-age 11-year-old females
4 " " 12-year-old females

Appendix table 4.
Dead pup counts by rookery, St. Paul Island, 1941, 1948-59

| Rookery | 1941 | 1948 | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Morjovi | 933 | (20600 | 2600 | 3000 | 3592 | - | 3764 | 8049 | 5571 | 10278 | 4253 | 2290 | 4560 |
| Vostochni | 7708 | ( | 12966 | 13120 | 18450 | - | 19503 | 25233 | 14473 | 20498 | 12732 | 7247 | 7105 |
| Little Polovina | 292 | - | 1600 | 1740 | 2208 | - | 2211 | 3852 | 2782 | 4443 | 1695 | 975 | 1597 |
| Polovina Cliffs | (2356 | - | - | 3800 | 5580 | 2954 | 5451 | 6413 | 5964 | 8637 | 4425 | 1826 | 2586 |
| Polovina | ( | - | 1779 | 5660 | 6402 | 3200 | 5036 | 6459 | 4660 | 7463 | 5432 | 2184 | 3311 |
| Ardiguen | 42 | - | - | 170 | 242 | - | 189 | 282 | 387 | 364 | 249 | 102 | 141 |
| Gorbatch | 896 | - | - | 2810 | 3559 | - | 3679 | 4900 | 4789 | 6291 | 3801 | 1655 | 2100 |
| Reef | 2269 | - | - | 9520 | 11007 | - | 13661 | 12959 | 15145 | 14399 | 11301 | 5550 | 6052 |
| Kitovi | (404 | - | 800 | 1160 | 1517 | - | 1695 | 1669 | 2610 | 2892 | 1588 | 608 | 882 |
| Lukanin | ( | - | 635 | 770 | 712 | - | 1086 | 1129 | 1129 | 1718 | 870 | 324 | 631 |
| Tolstoi | 1623 | - | - | 4230 | 6033 | - | 6154 | 7552 | 6489 | 6789 | 5659 | 2823 | 3691 |
| Little Zapadni | 372 | - | - | 2120 | 2804 | - | 2446 | 4979 | 3555 | 4611 | 2325 | 1312 | 1691 |
| Zapadni Reef | 171 | - | 575 | 660 | 353 | - | 1116 | 2278 | 1383 | 1674 | 917 | 246 | 608 |
| Zapadni | 1284 | - | - | 4660 | 8204 | - | 12221 | 10424 | 6607 | 8650 | 6415 | 4045 | 5009 |
| Total | 18350 | 20600[1/] | 20955[1/] | 53420 | 70663 | 6154[1/] | 78212 | 96178 | 75544 | 98707 | 61662 | 31187 | 39964 |

1/ Partial counts.

No counts made in years 1942 through 1947.

# Appendix table 5.

Age classification of females in commercial kill,
St. Paul Island, Alaska, 27 June to 20 August, 1959

| Date | Rookery | Females killed | Daily sample | Number in each age class of sample | | | | | | | | | | Percent in each age class of sample | | | | | | | | | | Estimated number killed from each age class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ |
| 27 June | NEP | 9 | 9 | - | - | 1 | 2 | 3 | 3 | - | - | - | - | - | - | 11 | 22 | 33 | 34 | - | - | - | - | - | - | 1 | 2 | 3 | 3 | - | - | - | - |
| 28 | TLK | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 29 | ZAP | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 30 | REEF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1 July | POL | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - |
| Round total | | 10 | 10 | - | - | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 2 | 3 | 4 | - | - | - | - |
| 2 July | NEP | 5 | 5 | - | - | - | 1 | - | 3 | 1 | - | - | - | - | - | - | 20 | - | 60 | 20 | - | - | - | - | - | - | 1 | - | 3 | 1 | - | - | - |
| 3 | TLK | 4 | 4 | - | - | - | - | 2 | 1 | - | - | 1 | - | - | - | - | - | 50 | 25 | - | - | 25 | - | - | - | - | - | 2 | 1 | - | - | 1 | - |
| 4 | ZAP | 4 | 4 | - | - | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 25 | 25 | 25 | 25 | - | - | - | - | - | - | 1 | 1 | 1 | 1 | - | - | - | - |
| 5 | REEF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 | POL | 4 | 4 | - | - | - | - | 1 | 1 | - | - | 1 | 1 | - | - | - | - | 25 | 25 | - | - | 25 | 25 | - | - | - | - | - | 1 | 1 | - | - | 1 |
| Round total | | 17 | 17 | - | - | 1 | 2 | 4 | 6 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 2 | 4 | 6 | 1 | - | 2 | 1 |
| 7 July | NEP | 8 | 8 | - | - | 2 | 1 | 1 | 1 | 1 | 1 | - | 1 | - | - | 25 | 12 | 13 | 12 | 13 | 12 | - | 13 | - | - | 2 | 1 | 1 | 1 | 1 | 1 | - | 1 |
| 8 | TLK | 2 | 2 | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | 50 | 50 | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - |
| 9 | ZAP | 2 | 2 | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | 50 | 50 | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - |
| 10 | REEF | 0 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - |
| 11 | POL | 4 | 3 | - | - | - | 1 | 1 | 1 | - | - | - | - | - | - | - | 33 | 34 | 33 | - | - | - | - | - | - | - | 1 | 1 | 2 | - | - | - | - |
| Round total | | 16 | 16 | - | - | 2 | 3 | 4 | 4 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 3 | 4 | 5 | 1 | 1 | - | 1 |
| 12 July | NEP | 13 | 13 | - | - | - | 4 | 5 | 1 | - | 1 | 2 | - | - | - | - | 31 | 38 | 8 | - | 8 | 15 | - | - | - | - | 4 | 5 | 1 | - | 1 | 2 | - |
| 13 | TLK | 2 | 2 | - | - | - | 1 | - | 1 | - | - | - | - | - | - | - | 50 | - | 50 | - | - | - | - | - | - | - | 1 | - | 1 | - | - | - | - |
| 14 | ZAP | 18 | 18 | - | - | 2 | 1 | 5 | 3 | 1 | - | 2 | 4 | - | - | 11 | 6 | 27 | 17 | 6 | - | 11 | 22 | - | - | 2 | 1 | 5 | 3 | 1 | - | 2 | 4 |
| 15 | REEF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | POL | 15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 1 | 4 | 2 | 1 | - | 2 | 3 |
| Round total | | 48 | 33 | - | - | 2 | 6 | 10 | 5 | 1 | 1 | 4 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | 4 | 7 | 14 | 7 | 2 | 1 | 6 | 7 |
| 17 July | NEP | 17 | 14 | - | - | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | - | - | 7 | 7 | 15 | 7 | 14 | 14 | 14 | 22 | - | - | 1 | 1 | 3 | 2 | 2 | 2 | 2 | 4 |
| 18 | TLK | 14 | 14 | - | - | - | 2 | 2 | 3 | - | 1 | 2 | 4 | - | - | - | 14 | 14 | 22 | - | 7 | 14 | 29 | - | - | - | 2 | 2 | 3 | - | 1 | 2 | 4 |
| 19 | ZAP | 47 | 44 | - | - | - | 6 | 8 | 4 | 1 | 4 | 3 | 18 | - | - | - | 14 | 18 | 9 | 2 | 9 | 7 | 41 | - | - | - | 7 | 9 | 4 | 1 | 4 | 3 | 19 |
| 20 | REEF | 2 | 2 | - | - | - | 1 | - | 1 | - | - | - | - | - | - | - | 50 | - | 50 | - | - | - | - | - | - | - | 1 | - | 1 | - | - | - | - |
| 21 | POL | 7 | 8 | - | - | 1 | 1 | 3 | 1 | 1 | - | - | 1 | - | - | 13 | 12 | 37 | 13 | 12 | - | - | 13 | - | - | 1 | 1 | 3 | 1 | 1 | - | - | 1 |
| Round total | | 87 | 82 | - | - | 2 | 11 | 15 | 10 | 4 | 7 | 7 | 26 | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 12 | 17 | 11 | 4 | 7 | 7 | 28 |
| 22 July | NEP | 34 | 28 | - | - | 1 | 6 | 8 | 5 | 3 | 2 | 1 | 2 | - | - | 4 | 21 | 28 | 18 | 11 | 7 | 4 | 7 | - | - | 1 | 8 | 10 | 6 | 4 | 2 | 1 | 2 |
| 23 | TLK | 12 | 12 | - | - | 1 | 3 | 2 | 2 | 1 | 1 | - | 2 | - | - | 8 | 25 | 17 | 17 | 8 | 8 | - | 17 | - | - | 1 | 3 | 2 | 2 | 1 | 1 | - | 2 |
| 24 | ZAP | 70 | 61 | - | - | 5 | 12 | 7 | 4 | 6 | 6 | 4 | 17 | - | - | 8 | 20 | 11 | 6 | 10 | 10 | 7 | 28 | - | - | 6 | 14 | 8 | 4 | 7 | 7 | 5 | 19 |
| 25 | REEF | 1 | 1 | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | 1 | - | - | - |
| 26 | POL | 19 | 18 | - | - | 5 | 7 | 4 | 2 | - | - | - | - | - | - | 28 | 39 | 22 | 11 | - | - | - | - | - | - | 5 | 8 | 4 | 2 | - | - | - | - |
| Round total | | 136 | 120 | - | - | 12 | 28 | 21 | 13 | 11 | 9 | 5 | 21 | - | - | - | - | - | - | - | - | - | - | - | - | 13 | 33 | 24 | 14 | 13 | 10 | 6 | 23 |
| 27 July | NEP | 19 | 14 | - | - | 4 | 3 | 2 | 1 | - | 2 | 1 | 1 | - | - | 29 | 22 | 14 | 7 | - | 14 | 7 | 7 | - | - | 6 | 4 | 3 | 1 | - | 3 | 1 | 1 |
| 28 | TLK | 194 | 98 | - | 1 | 6 | 22 | 9 | 16 | 5 | 5 | 7 | 27 | - | 1 | 6 | 23 | 9 | 16 | 5 | 5 | 7 | 28 | - | 2 | 12 | 44 | 17 | 31 | 10 | 10 | 14 | 54 |
| 29 | ZAP | 33 | 29 | - | 1 | 8 | 4 | 1 | 1 | 6 | 1 | 1 | 6 | - | 3 | 29 | 14 | 3 | 3 | 21 | 3 | 3 | 21 | - | 1 | 9 | 5 | 1 | 1 | 7 | 1 | 1 | 7 |
| 30 | REEF | 2 | 2 | - | - | - | - | - | - | - | 1 | - | 1 | - | - | - | - | - | - | - | 50 | - | 50 | - | - | - | - | - | - | - | 1 | - | 1 |
| 31 | POL | 34 | 31 | - | - | 7 | 8 | 3 | 4 | - | 2 | 1 | 6 | - | - | 23 | 26 | 10 | 13 | - | 6 | 3 | 19 | - | - | 8 | 10 | 3 | 4 | - | 2 | 1 | 6 |
| Round total | | 282 | 174 | - | 2 | 25 | 37 | 15 | 22 | 11 | 11 | 10 | 41 | - | - | - | - | - | - | - | - | - | - | - | - | 3 | 35 | 63 | 24 | 37 | 17 | 17 | 17 | 69 |
| 1 August | NEP | 293 | 77 | - | - | 10 | 9 | 10 | 17 | 5 | 3 | 7 | 16 | - | - | 13 | 12 | 13 | 22 | 7 | 4 | 9 | 20 | - | - | 38 | 35 | 38 | 64 | 21 | 12 | 26 | 59 |
| 2 | TLK | 196 | 45 | - | - | 7 | 8 | 10 | 3 | 3 | 5 | 2 | 7 | - | - | 16 | 18 | 24 | 4 | 7 | 11 | 4 | 16 | - | - | 31 | 35 | 47 | 8 | 14 | 22 | 8 | 31 |
| 3 | ZAP | 597 | 128 | - | 3 | 28 | 19 | 18 | 12 | 9 | 8 | 3 | 28 | - | 2 | 23 | 15 | 14 | 9 | 7 | 6 | 2 | 22 | - | 12 | 137 | 89 | 84 | 54 | 42 | 36 | 12 | 131 |
| 4 | REEF | 100 | 23 | - | - | 6 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | - | - | 25 | 9 | 9 | 9 | 9 | 13 | 13 | 13 | - | - | 25 | 9 | 9 | 9 | 9 | 13 | 13 | 13 |
| 5 | POL | 269 | 70 | - | 1 | 15 | 12 | 6 | 9 | 8 | 4 | 2 | 13 | - | 1 | 21 | 17 | 9 | 11 | 13 | 6 | 3 | 19 | - | 3 | 56 | 46 | 24 | 30 | 35 | 16 | 8 | 51 |
| Round total | | 1455 | 343 | - | 4 | 66 | 50 | 46 | 43 | 27 | 23 | 17 | 67 | - | - | - | - | - | - | - | - | - | - | - | - | 15 | 287 | 214 | 202 | 165 | 121 | 99 | 67 | 285 |
| 6 August | NEP | 1503 | 203 | - | 4 | 41 | 27 | 20 | 40 | 21 | 9 | 11 | 30 | - | 2 | 21 | 13 | 10 | 20 | 10 | 4 | 5 | 15 | - | 30 | 316 | 195 | 150 | 301 | 150 | 60 | 75 | 226 |
| 7 | TLK | 712 | 164 | - | 5 | 36 | 29 | 20 | 19 | 13 | 12 | 9 | 21 | - | 3 | 22 | 18 | 12 | 12 | 8 | 7 | 5 | 13 | - | 21 | 157 | 128 | 85 | 85 | 57 | 50 | 36 | 93 |
| 8 | ZAP | 1163 | 261 | - | 14 | 74 | 55 | 27 | 24 | 14 | 10 | 11 | 32 | - | 5 | 29 | 22 | 10 | 9 | 5 | 4 | 4 | 12 | - | 58 | 338 | 256 | 116 | 105 | 58 | 46 | 46 | 140 |
| 9 | REEF | 226 | 65 | - | 3 | 12 | 3 | 3 | 11 | 10 | 5 | 2 | 16 | - | 5 | 18 | 5 | 5 | 15 | 15 | 8 | 3 | 26 | - | 11 | 41 | 11 | 11 | 34 | 34 | 18 | 7 | 59 |
| 10 | POL | 783 | 165 | 1 | 9 | 36 | 18 | 22 | 19 | 15 | 8 | 4 | 33 | 1 | 5 | 22 | 11 | 13 | 12 | 9 | 5 | 2 | 20 | 8 | 39 | 172 | 86 | 102 | 94 | 70 | 39 | 16 | 157 |
| Round total | | 4387 | 858 | 1 | 35 | 199 | 132 | 92 | 113 | 73 | 44 | 37 | 132 | - | - | - | - | - | - | - | - | - | - | 8 | 159 | 1024 | 676 | 464 | 619 | 369 | 213 | 180 | 675 |
| 11 August | NEP | 3664 | 402 | - | 22 | 51 | 38 | 48 | 57 | 24 | 25 | 23 | 114 | - | 5 | 13 | 9 | 12 | 14 | 6 | 6 | 6 | 29 | - | 183 | 476 | 330 | 440 | 513 | 220 | 220 | 220 | 1062 |
| 12 | TLK | 479 | 100 | - | 12 | 36 | 13 | 8 | 13 | 2 | 2 | 4 | 10 | - | 12 | 36 | 13 | 8 | 13 | 2 | 2 | 4 | 10 | - | 57 | 172 | 62 | 38 | 62 | 10 | 10 | 19 | 49 |
| 13 | ZAP | 2194 | 267 | 6 | 37 | 105 | 32 | 30 | 13 | 10 | 8 | 2 | 24 | 2 | 14 | 39 | 12 | 11 | 5 | 4 | 3 | 1 | 9 | 44 | 307 | 856 | 263 | 241 | 110 | 88 | 66 | 22 | 197 |
| 14 | REEF | 959 | 184 | 1 | 10 | 62 | 26 | 26 | 16 | 17 | 5 | 6 | 15 | 1 | 5 | 34 | 14 | 14 | 9 | 9 | 3 | 3 | 8 | 10 | 48 | 326 | 134 | 134 | 86 | 86 | 29 | 29 | 77 |
| 15 | POL | 2637 | 281 | 3 | 21 | 74 | 30 | 16 | 49 | 14 | 6 | 10 | 58 | 1 | 7 | 26 | 11 | 6 | 17 | 5 | 2 | 4 | 21 | 26 | 185 | 686 | 290 | 158 | 448 | 132 | 53 | 105 | 554 |
| Round total | | 9993 | 1234 | 10 | 102 | 328 | 139 | 128 | 148 | 67 | 46 | 45 | 221 | - | - | - | - | - | - | - | - | - | - | 80 | 780 | 2516 | 1079 | 1011 | 1219 | 536 | 378 | 395 | 1939 |
| 16 August | NEP | 2250 | 302 | 7 | 34 | 105 | 49 | 23 | 32 | 14 | 9 | 9 | 20 | 2 | 11 | 34 | 16 | 8 | 11 | 5 | 3 | 3 | 7 | 45 | 248 | 765 | 360 | 180 | 248 | 112 | 67 | 67 | 158 |
| 17 | TLK | 1477 | 193 | - | 19 | 59 | 27 | 17 | 19 | 11 | 5 | 6 | 30 | - | 10 | 30 | 14 | 9 | 10 | 6 | 3 | 3 | 15 | - | 148 | 443 | 207 | 133 | 148 | 89 | 44 | 44 | 221 |
| 18 | ZAP | 603 | 138 | 3 | 10 | 37 | 16 | 9 | 8 | 9 | 5 | 3 | 38 | 2 | 7 | 27 | 11 | 7 | 6 | 7 | 3 | 2 | 28 | 12 | 42 | 164 | 66 | 42 | 36 | 42 | 18 | 12 | 169 |
| 19 | REEF | 1164 | 234 | 1 | 27 | 64 | 23 | 26 | 14 | 10 | 8 | 4 | 57 | - | 12 | 28 | 10 | 11 | 6 | 4 | 3 | 2 | 24 | - | 140 | 326 | 116 | 128 | 70 | 47 | 35 | 23 | 279 |
| 20 | POL | 2342 | 230 | 8 | 24 | 75 | 26 | 16 | 26 | 13 | 2 | 3 | 37 | 3 | 10 | 34 | 11 | 7 | 11 | 6 | 1 | 1 | 16 | 70 | 234 | 796 | 258 | 164 | 258 | 141 | 23 | 23 | 375 |
| Round total | | 7836 | 1097 | 19 | 114 | 340 | 141 | 91 | 99 | 57 | 29 | 25 | 182 | - | - | - | - | - | - | - | - | - | - | 127 | 812 | 2494 | 1007 | 647 | 760 | 431 | 187 | 169 | 1202 |
| Season total | | 24207 | 3984 | 30 | 257 | 978 | 551 | 429 | 467 | 253 | 171 | 152 | 696 | - | - | - | - | - | - | - | - | - | - | 215 | 1769 | 6379 | 3098 | 2414 | 2847 | 1495 | 913 | 849 | 4230 |

# Appendix table 6.

Cumulative age classification of female seals in commercial kill, by day, St. Paul Island, 27 June to 20 August 1959

| | | Number killed from age class | | | | | | | | | | Total | Percent killed from age class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Rookery | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | killed | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ |
| June | | | | | | | | | | | | | | | | | | | | | | |
| 27 | NEP | - | - | 1 | 2 | 3 | 3 | - | - | - | - | 9 | - | - | 11 | 22 | 33 | 34 | - | - | - | - |
| 28 | TLK | - | - | 1 | 2 | 3 | 3 | - | - | - | - | 9 | - | - | 11 | 22 | 33 | 34 | - | - | - | - |
| 29 | ZAP | - | - | 1 | 2 | 3 | 3 | - | - | - | - | 9 | - | - | 11 | 22 | 33 | 34 | - | - | - | - |
| 30 | REEF | - | - | 1 | 2 | 3 | 3 | - | - | - | - | 9 | - | - | 11 | 22 | 33 | 34 | - | - | - | - |
| July | | | | | | | | | | | | | | | | | | | | | | |
| 1 | POL | - | - | 1 | 2 | 3 | 4 | - | - | - | - | 10 | - | - | 10 | 20 | 30 | 40 | - | - | - | - |
| 2 | NEP | - | - | 1 | 3 | 3 | 7 | 1 | - | - | - | 15 | - | - | 7 | 20 | 20 | 46 | 7 | - | - | - |
| 3 | TLK | - | - | 1 | 3 | 5 | 8 | 1 | - | 1 | - | 19 | - | - | 5 | 16 | 27 | 42 | 5 | - | 5 | - |
| 4 | ZAP | - | - | 2 | 4 | 6 | 9 | 1 | - | 1 | - | 23 | - | - | 9 | 17 | 26 | 39 | 4 | - | 5 | - |
| 5 | REEF | - | - | 2 | 4 | 6 | 9 | 1 | - | 1 | - | 23 | - | - | 9 | 17 | 26 | 39 | 4 | - | 5 | - |
| 6 | POL | - | - | 2 | 4 | 7 | 10 | 1 | - | 2 | 1 | 27 | - | - | 7 | 15 | 26 | 37 | 4 | - | 7 | 4 |
| 7 | NEP | - | - | 4 | 5 | 8 | 11 | 2 | 1 | 2 | 2 | 35 | - | - | 11 | 14 | 23 | 31 | 6 | 3 | 6 | 6 |
| 8 | TLK | - | - | 4 | 6 | 9 | 11 | 2 | 1 | 2 | 2 | 37 | - | - | 11 | 14 | 23 | 31 | 6 | 3 | 6 | 6 |
| 9 | ZAP | - | - | 4 | 6 | 10 | 12 | 2 | 1 | 2 | 2 | 39 | - | - | 11 | 14 | 23 | 31 | 6 | 3 | 6 | 6 |
| 10 | REEF | - | - | 4 | 6 | 10 | 13 | 2 | 1 | 2 | 2 | 40 | - | - | 11 | 14 | 23 | 31 | 6 | 3 | 6 | 6 |
| 11 | POL | - | - | 4 | 7 | 11 | 15 | 2 | 1 | 2 | 2 | 44 | - | - | 9 | 15 | 25 | 34 | 5 | 2 | 5 | 5 |
| 12 | NEP | - | - | 4 | 11 | 16 | 16 | 2 | 2 | 4 | 2 | 57 | - | - | 7 | 20 | 30 | 26 | 3 | 3 | 8 | 3 |
| 13 | TLK | - | - | 4 | 12 | 16 | 17 | 2 | 2 | 4 | 2 | 59 | - | - | 7 | 20 | 30 | 26 | 3 | 3 | 8 | 3 |
| 14 | ZAP | - | - | 6 | 13 | 21 | 20 | 3 | 2 | 6 | 6 | 77 | - | - | 7 | 20 | 30 | 26 | 3 | 3 | 8 | 3 |
| 15 | REEF | - | - | 6 | 13 | 21 | 20 | 3 | 2 | 6 | 6 | 77 | - | - | 7 | 20 | 30 | 26 | 3 | 3 | 8 | 3 |
| 16 | POL | - | - | 8 | 14 | 25 | 22 | 4 | 2 | 8 | 9 | 92 | - | - | 8 | 16 | 28 | 24 | 4 | 2 | 9 | 9 |
| 17 | NEP | - | - | 9 | 15 | 28 | 24 | 6 | 4 | 10 | 13 | 109 | - | - | 8 | 16 | 28 | 24 | 4 | 2 | 9 | 9 |
| 18 | TLK | - | - | 9 | 17 | 30 | 27 | 6 | 5 | 12 | 17 | 123 | - | - | 8 | 16 | 28 | 24 | 4 | 2 | 9 | 9 |
| 19 | ZAP | - | - | 9 | 24 | 39 | 31 | 7 | 9 | 15 | 36 | 170 | - | - | 8 | 16 | 28 | 24 | 4 | 2 | 9 | 9 |
| 20 | REEF | - | - | 9 | 25 | 39 | 32 | 7 | 9 | 15 | 36 | 172 | - | - | 8 | 16 | 28 | 24 | 4 | 2 | 9 | 9 |
| 21 | POL | - | - | 10 | 26 | 42 | 33 | 8 | 9 | 15 | 37 | 180 | - | - | 5 | 15 | 24 | 18 | 4 | 5 | 9 | 20 |
| 22 | NEP | - | - | 11 | 34 | 52 | 39 | 12 | 11 | 16 | 39 | 214 | - | - | 5 | 16 | 25 | 18 | 5 | 5 | 8 | 18 |
| 23 | TLK | - | - | 12 | 37 | 54 | 41 | 13 | 12 | 16 | 41 | 226 | - | - | 5 | 16 | 25 | 18 | 5 | 5 | 8 | 18 |
| 24 | ZAP | - | - | 18 | 51 | 62 | 45 | 20 | 19 | 21 | 60 | 296 | - | - | 5 | 16 | 25 | 18 | 5 | 5 | 8 | 18 |
| 25 | REEF | - | - | 18 | 51 | 62 | 45 | 21 | 19 | 21 | 60 | 297 | - | - | 5 | 16 | 25 | 18 | 5 | 5 | 8 | 18 |
| 26 | POL | - | - | 23 | 59 | 66 | 47 | 21 | 19 | 21 | 60 | 316 | - | - | 7 | 19 | 21 | 15 | 6 | 6 | 7 | 19 |
| 27 | NEP | - | - | 29 | 63 | 69 | 48 | 21 | 22 | 22 | 61 | 335 | - | - | 9 | 19 | 21 | 14 | 6 | 6 | 7 | 18 |
| 28 | TLK | - | 2 | 41 | 107 | 86 | 79 | 31 | 32 | 36 | 115 | 529 | - | - | 9 | 19 | 21 | 14 | 6 | 6 | 7 | 18 |
| 29 | ZAP | - | 3 | 50 | 112 | 87 | 80 | 38 | 33 | 37 | 122 | 562 | - | - | 9 | 19 | 21 | 14 | 6 | 6 | 7 | 18 |
| 30 | REEF | - | 3 | 50 | 112 | 87 | 80 | 38 | 34 | 37 | 123 | 564 | - | - | 9 | 19 | 21 | 14 | 6 | 6 | 7 | 18 |
| 31 | POL | - | 3 | 58 | 122 | 90 | 84 | 38 | 36 | 38 | 129 | 598 | - | <1 | 10 | 20 | 15 | 14 | 6 | 6 | 7 | 22 |
| Aug. | | | | | | | | | | | | | | | | | | | | | | |
| 1 | NEP | - | 3 | 96 | 157 | 128 | 148 | 59 | 48 | 64 | 188 | 891 | - | <1 | 11 | 18 | 15 | 17 | 6 | 5 | 7 | 21 |
| 2 | TLK | - | 3 | 127 | 192 | 175 | 156 | 73 | 70 | 72 | 219 | 1087 | - | <1 | 11 | 18 | 15 | 17 | 6 | 5 | 7 | 21 |
| 3 | ZAP | - | 15 | 264 | 281 | 259 | 210 | 115 | 106 | 84 | 350 | 1684 | - | <1 | 11 | 18 | 15 | 17 | 6 | 5 | 7 | 21 |
| 4 | REEF | - | 15 | 289 | 290 | 268 | 219 | 124 | 119 | 97 | 363 | 1784 | - | <1 | 11 | 18 | 15 | 17 | 6 | 5 | 7 | 21 |
| 5 | POL | - | 18 | 345 | 336 | 292 | 249 | 159 | 135 | 105 | 414 | 2053 | - | 1 | 17 | 16 | 14 | 12 | 8 | 7 | 5 | 20 |
| 6 | NEP | - | 48 | 661 | 531 | 442 | 550 | 309 | 195 | 180 | 640 | 3556 | - | 1 | 19 | 15 | 12 | 16 | 9 | 5 | 5 | 18 |
| 7 | TLK | - | 69 | 818 | 659 | 527 | 635 | 366 | 245 | 216 | 733 | 4268 | - | 1 | 19 | 15 | 12 | 16 | 9 | 5 | 5 | 18 |
| 8 | ZAP | - | 127 | 1156 | 915 | 643 | 740 | 424 | 291 | 262 | 873 | 5431 | - | 2 | 21 | 17 | 12 | 14 | 8 | 5 | 5 | 16 |
| 9 | REEF | - | 138 | 1197 | 926 | 654 | 774 | 458 | 309 | 269 | 932 | 5657 | - | 2 | 21 | 17 | 12 | 14 | 8 | 5 | 5 | 16 |
| 10 | POL | 8 | 177 | 1369 | 1012 | 756 | 868 | 528 | 348 | 285 | 1089 | 6440 | <1 | 3 | 21 | 16 | 12 | 13 | 8 | 5 | 5 | 17 |
| 11 | NEP | 8 | 360 | 1845 | 1342 | 1196 | 1381 | 748 | 568 | 505 | 2151 | 10104 | <1 | 4 | 18 | 13 | 12 | 14 | 7 | 6 | 5 | 21 |
| 12 | TLK | 8 | 417 | 2017 | 1404 | 1234 | 1443 | 758 | 578 | 524 | 2200 | 10583 | <1 | 4 | 18 | 13 | 12 | 14 | 7 | 6 | 5 | 21 |
| 13 | ZAP | 52 | 724 | 2873 | 1667 | 1475 | 1553 | 846 | 644 | 546 | 2397 | 12777 | <1 | 6 | 22 | 13 | 12 | 12 | 7 | 5 | 4 | 19 |
| 14 | REEF | 62 | 772 | 3199 | 1801 | 1609 | 1639 | 932 | 673 | 575 | 2474 | 13736 | <1 | 6 | 22 | 13 | 12 | 12 | 7 | 5 | 4 | 19 |
| 15 | POL | 88 | 957 | 3885 | 2091 | 1767 | 2087 | 1064 | 726 | 680 | 3028 | 16373 | <1 | 6 | 24 | 13 | 11 | 13 | 7 | 4 | 4 | 18 |
| 16 | NEP | 133 | 1205 | 4650 | 2451 | 1947 | 2335 | 1176 | 793 | 747 | 3186 | 18623 | <1 | 7 | 25 | 13 | 11 | 13 | 6 | 4 | 4 | 17 |
| 17 | TLK | 133 | 1353 | 5093 | 2658 | 2080 | 2483 | 1265 | 837 | 791 | 3407 | 20100 | <1 | 7 | 25 | 13 | 11 | 13 | 6 | 4 | 4 | 17 |
| 18 | ZAP | 145 | 1395 | 5257 | 2724 | 2122 | 2519 | 1307 | 855 | 803 | 3576 | 20703 | 1 | 7 | 26 | 13 | 10 | 12 | 6 | 4 | 4 | 17 |
| 19 | REEF | 145 | 1535 | 5583 | 2840 | 2250 | 2589 | 1354 | 890 | 826 | 3855 | 21867 | 1 | 7 | 26 | 13 | 10 | 12 | 6 | 4 | 4 | 17 |
| 20 | POL | 215 | 1769 | 6379 | 3098 | 2414 | 2847 | 1495 | 913 | 849 | 4230 | 24209 | 1 | 7 | 26 | 13 | 10 | 12 | 6 | 4 | 4 | 17 |

# Appendix table 7.

Number pregnant and nonpregnant among female seals 4 or more years old and 5 or more years old, St. Paul Island, 1959

| Date | Daily kill | Daily sample | Daily sample less 2 & 3 yr. olds | Ages 4-10+ pregnant | Ages 4-10+ non-pregnant | Daily sample less 2, 3, & 4 yr. olds | Ages 5-10+ pregnant | Ages 5-10+ non-pregnant |
|---|---|---|---|---|---|---|---|---|
| June | | | | | | | | |
| 27 | 9 | 9 | 9 | 7 | 2 | 8 | 6 | 2 |
| 28 | - | - | - | - | - | - | - | - |
| 29 | - | - | - | - | - | - | - | - |
| 30 | - | - | - | - | - | - | - | - |
| July | | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | - | 1 | 1 | - |
| 2 | 5 | 5 | 5 | 5 | - | 5 | 5 | - |
| 3 | 4 | 4 | 4 | 4 | - | 4 | 4 | - |
| 4 | 4 | 4 | 4 | 4 | - | 3 | 3 | - |
| 5 | - | - | - | - | - | - | - | - |
| 6 | 4 | 4 | 4 | 4 | - | 4 | 4 | - |
| 7 | 8 | 8 | 8 | 8 | - | 6 | 6 | - |
| 8 | 2 | 2 | 2 | 2 | - | 2 | 2 | - |
| 9 | 2 | 2 | 2 | 2 | - | 2 | 2 | - |
| 10 | - | - | - | - | - | - | - | - |
| 11 | 4 | 4 | 4 | 2 | 2 | 4 | 2 | 2 |
| 12 | 13 | 13 | 13 | 11 | 2 | 13 | 11 | 2 |
| 13 | 2 | 2 | 2 | 2 | - | 2 | 2 | - |
| 14 | 18 | 18 | 18 | 15 | 3 | 16 | 13 | 3 |
| 15 | - | - | - | - | - | - | - | - |
| 16 | 15 | - | - | - | - | - | - | - |
| 17 | 17 | 14 | 14 | 10 | 4 | 13 | 10 | 3 |
| 18 | 14 | 14 | 14 | 11 | 3 | 14 | 11 | 3 |
| 19 | 47 | 44 | 44 | 28 | 16 | 44 | 28 | 16 |
| 20 | 2 | 2 | 2 | 2 | - | 2 | 2 | - |
| 21 | 7 | 8 | 8 | 6 | 2 | 7 | 6 | 1 |
| 22 | 34 | 28 | 28 | 20 | 8 | 27 | 20 | 7 |
| 23 | 12 | 12 | 12 | 8 | 4 | 11 | 8 | 3 |
| 24 | 70 | 61 | 61 | 32 | 29 | 56 | 30 | 26 |
| 25 | 1 | 1 | 1 | 1 | - | 1 | 1 | - |
| 26 | 19 | 18 | 18 | 13 | 5 | 13 | 10 | 3 |
| 27 | 19 | 14 | 14 | 6 | 8 | 10 | 5 | 5 |
| 28 | 194 | 98 | 97 | 56 | 41 | 91 | 56 | 35 |
| 29 | 33 | 29 | 28 | 13 | 15 | 20 | 10 | 10 |
| 30 | 2 | 2 | 2 | - | 2 | 2 | - | 2 |
| 31 | 34 | 31 | 31 | 11 | 20 | 24 | 10 | 14 |
| August | | | | | | | | |
| 1 | 293 | 77 | 77 | 38 | 39 | 67 | 38 | 29 |
| 2 | 196 | 45 | 45 | 16 | 29 | 38 | 15 | 23 |
| 3 | 597 | 128 | 125 | 55 | 70 | 97 | 47 | 50 |
| 4 | 100 | 23 | 23 | 11 | 12 | 17 | 10 | 7 |
| 5 | 269 | 70 | 69 | 35 | 34 | 54 | 31 | 23 |
| 6 | 1,503 | 203 | 199 | 67 | 132 | 158 | 65 | 93 |
| 7 | 712 | 164 | 159 | 64 | 95 | 123 | 57 | 66 |
| 8 | 1,163 | 261 | 247 | 83 | 164 | 173 | 71 | 102 |
| 9 | 226 | 65 | 62 | 29 | 33 | 50 | 27 | 23 |
| 10 | 783 | 165 | 155 | 67 | 88 | 119 | 59 | 60 |
| 11 | 3,664 | 402 | 380 | 163 | 217 | 329 | 154 | 175 |
| 12 | 479 | 100 | 88 | 29 | 59 | 52 | 26 | 26 |
| 13 | 2,194 | 267 | 224 | 68 | 156 | 119 | 56 | 63 |
| 14 | 959 | 184 | 173 | 70 | 103 | 111 | 61 | 50 |
| 15 | 2,637 | 281 | 257 | 107 | 150 | 183 | 96 | 87 |
| 16 | 2,250 | 302 | 261 | 88 | 173 | 156 | 75 | 81 |
| 17 | 1,477 | 193 | 174 | 64 | 119 | 115 | 56 | 59 |
| 18 | 603 | 138 | 125 | 48 | 77 | 88 | 44 | 44 |
| 19 | 1,164 | 234 | 206 | 79 | 127 | 142 | 69 | 73 |
| 20 | 2,342 | 230 | 198 | 84 | 114 | 123 | 78 | 45 |
| Total | 24,207 | 3,984 | 3,697 | 1,549 | 2,148 | 2,719 | 1,403 | 1,316 |

## Appendix table 8.

**Length of female seals sampled from commercial kill by age, St. Paul Island, 1959**

| Length in inches | | Age 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 | number | 3 | - | - | - | - | - | - | - | - | - | 3 |
| | percent | 10 | - | - | - | - | - | - | - | - | - | - |
| 38 | number | 3 | 2 | - | - | - | - | - | - | - | - | 5 |
| | percent | 10 | 1 | - | - | - | - | - | - | - | - | - |
| 39 | number | 4 | 13 | 6 | - | - | - | - | - | - | - | 23 |
| | percent | 13 | 5 | 1 | - | - | - | - | - | - | - | 1 |
| 40 | number | 10 | 50 | 26 | 5 | 2 | 1 | - | 1 | - | - | 95 |
| | percent | 34 | 19 | 3 | 1 | - | - | - | 1 | - | - | 2 |
| 41 | number | 9 | 84 | 128 | 30 | 14 | 6 | 1 | 1 | 1 | 3 | 277 |
| | percent | 30 | 33 | 13 | 6 | 3 | 1 | - | 1 | 1 | 1 | 7 |
| 42 | number | 1 | 58 | 239 | 72 | 32 | 28 | 9 | 7 | 1 | 6 | 453 |
| | percent | 3 | 23 | 25 | 13 | 8 | 6 | 3 | 4 | 1 | 1 | 11 |
| 43 | number | - | 36 | 245 | 132 | 80 | 72 | 17 | 7 | 5 | 26 | 620 |
| | percent | - | 14 | 25 | 24 | 19 | 15 | 7 | 4 | 3 | 4 | 16 |
| 44 | number | - | 8 | 198 | 131 | 98 | 100 | 49 | 31 | 12 | 62 | 689 |
| | percent | - | 3 | 20 | 24 | 23 | 22 | 19 | 18 | 8 | 9 | 17 |
| 45 | number | - | 6 | 91 | 100 | 102 | 102 | 60 | 34 | 24 | 121 | 640 |
| | percent | - | 2 | 9 | 18 | 24 | 22 | 24 | 20 | 14 | 18 | 16 |
| 46 | number | - | - | 31 | 49 | 52 | 71 | 47 | 33 | 36 | 112 | 431 |
| | percent | - | - | 3 | 9 | 12 | 15 | 19 | 19 | 24 | 16 | 11 |
| 47 | number | - | - | 12 | 21 | 31 | 51 | 33 | 25 | 36 | 130 | 339 |
| | percent | - | - | 1 | 4 | 7 | 11 | 13 | 14 | 24 | 18 | 9 |
| 48 | number | - | - | 2 | 9 | 13 | 24 | 20 | 22 | 19 | 98 | 207 |
| | percent | - | - | - | 1 | 3 | 5 | 8 | 13 | 12 | 14 | 5 |
| 49 | number | - | - | - | 2 | 3 | 7 | 12 | 8 | 12 | 70 | 114 |
| | percent | - | - | - | - | 1 | 2 | 5 | 5 | 8 | 10 | 3 |
| 50 | number | - | - | - | - | 1 | 1 | 3 | 2 | 4 | 37 | 48 |
| | percent | - | - | - | - | - | - | 1 | 1 | 3 | 5 | 1 |
| 51 | number | - | - | - | - | 1 | 4 | 2 | - | 2 | 31 | 40 |
| | percent | - | - | - | - | - | 1 | 1 | - | 1 | 4 | 1 |
| Total | | 30 | 257 | 978 | 551 | 429 | 467 | 253 | 171 | 152 | 696 | 3,984 |
| Percent | | 1 | 6 | 25 | 14 | 11 | 12 | 6 | 4 | 4 | 17 | |

Appendix table 9.
Reproductive condition of female seals sampled from commercial kill, by length, St. Paul Island, 1959

| Length in inches | | Nullipara | Primipara pregnant | Primipara non-pregnant | Multipara pregnant | Multipara non-pregnant | Total |
|---|---|---|---|---|---|---|---|
| 37 | number | 3 | - | - | - | - | 3 |
| | percent | - | - | - | - | - | - |
| 38 | number | 5 | - | - | - | - | 5 |
| | percent | - | - | - | - | - | - |
| 39 | number | 21 | 2 | - | - | - | 23 |
| | percent | 1 | - | - | - | - | 1 |
| 40 | number | 84 | 8 | 1 | 1 | 1 | 95 |
| | percent | 6 | 1 | 1 | - | - | 2 |
| 41 | number | 212 | 49 | 5 | 8 | 3 | 277 |
| | percent | 15 | 7 | 5 | 1 | - | 7 |
| 42 | number | 307 | 88 | 6 | 27 | 25 | 453 |
| | percent | 22 | 12 | 6 | 3 | 3 | 11 |
| 43 | number | 308 | 174 | 21 | 61 | 56 | 620 |
| | percent | 22 | 24 | 20 | 7 | 6 | 16 |
| 44 | number | 251 | 167 | 19 | 134 | 118 | 689 |
| | percent | 18 | 23 | 18 | 17 | 13 | 17 |
| 45 | number | 137 | 138 | 32 | 154 | 179 | 640 |
| | percent | 10 | 19 | 31 | 19 | 20 | 16 |
| 46 | number | 58 | 54 | 15 | 148 | 156 | 431 |
| | percent | 4 | 7 | 15 | 18 | 18 | 11 |
| 47 | number | 35 | 31 | 3 | 134 | 136 | 339 |
| | percent | 2 | 4 | 3 | 17 | 15 | 9 |
| 48 | number | 3 | 19 | 2 | 76 | 107 | 207 |
| | percent | - | 2 | 1 | 9 | 12 | 5 |
| 49 | number | 3 | 5 | - | 43 | 63 | 114 |
| | percent | - | 1 | - | 5 | 7 | 3 |
| 50 | number | 1 | 1 | - | 18 | 28 | 48 |
| | percent | - | - | - | 2 | 3 | 1 |
| 51 | number | 2 | - | - | 12 | 26 | 40 |
| | percent | - | - | - | 2 | 3 | 1 |
| Total | | 1,430 | 736 | 104 | 816 | 898 | 3,984 |
| Percent | | 36 | 18 | 3 | 21 | 22 | |

Appendix table 10.
Length of tagged female seals recovered from commercial kill, by age, St. Paul Island, 1959

| Length in inches | | Age 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | number | 1 | 1 | - | - | - | - | - | - | - | - | 2 |
| | percent | 14 | 1 | - | - | - | - | - | - | - | - | - |
| 39 | number | - | 1 | 2 | - | - | - | - | - | - | - | 3 |
| | percent | - | 1 | - | - | - | - | - | - | - | - | - |
| 40 | number | 2 | 12 | 8 | 1 | - | - | - | - | - | - | 23 |
| | percent | 29 | 15 | 2 | 2 | - | - | - | - | - | - | 3 |
| 41 | number | 4 | 29 | 58 | 1 | 5 | - | - | - | - | - | 97 |
| | percent | 57 | 37 | 14 | 2 | 11 | - | - | - | - | - | 12 |
| 42 | number | - | 23 | 108 | 5 | 4 | 5 | 1 | - | - | - | 146 |
| | percent | - | 30 | 27 | 8 | 9 | 4 | 17 | - | - | - | 19 |
| 43 | number | - | 8 | 100 | 15 | 6 | 15 | - | 1 | - | - | 145 |
| | percent | - | 10 | 25 | 23 | 13 | 12 | - | 3 | - | - | 19 |
| 44 | number | - | 4 | 72 | 17 | 16 | 25 | 1 | 2 | 4 | - | 141 |
| | percent | - | 5 | 18 | 26 | 35 | 21 | 17 | 7 | 14 | - | 18 |
| 45 | number | - | 1 | 40 | 18 | 8 | 33 | - | 1 | 3 | 2 | 106 |
| | percent | - | 1 | 10 | 28 | 17 | 27 | - | 3 | 10 | 40 | 13 |
| 46 | number | - | - | 13 | 5 | 5 | 24 | 1 | 11 | 4 | - | 63 |
| | percent | - | - | 3 | 8 | 11 | 20 | 17 | 38 | 14 | - | 8 |
| 47 | number | - | - | 4 | 2 | 2 | 9 | 2 | 8 | 7 | 1 | 35 |
| | percent | - | - | 1 | 3 | 4 | 7 | 32 | 28 | 24 | 20 | 4 |
| 48 | number | - | - | - | - | - | 5 | 1 | 2 | 5 | - | 13 |
| | percent | - | - | - | - | - | 4 | 17 | 7 | 18 | - | 2 |
| 49 | number | - | - | - | - | - | 2 | - | 2 | 1 | - | 5 |
| | percent | - | - | - | - | - | 2 | - | 7 | 3 | - | 1 |
| 50 | number | - | - | - | - | - | 1 | - | 2 | 3 | 2 | 8 |
| | percent | - | - | - | - | - | 1 | - | 7 | 10 | 40 | 1 |
| 51 | number | - | - | - | - | - | 2 | - | - | 2 | - | 4 |
| | percent | - | - | - | - | - | 2 | - | - | 7 | - | - |
| Total | | 7 | 79 | 405 | 64 | 46 | 121 | 6 | 29 | 29 | 5 | 791 |

Appendix table 11.
Vibrissal color of female seals sampled from commercial kill, by length, St. Paul Island, 1959

| Length in inches | | Vibrissal color | | | Total |
|---|---|---|---|---|---|
| | | black | black-and-white | white | |
| 37 | number | 3 | - | - | 3 |
| | percent | - | - | - | - |
| 38 | number | 5 | - | - | 5 |
| | percent | 1 | - | - | - |
| 39 | number | 18 | 5 | - | 23 |
| | percent | 2 | - | - | 1 |
| 40 | number | 79 | 12 | 4 | 95 |
| | percent | 10 | 1 | - | 2 |
| 41 | number | 163 | 92 | 22 | 277 |
| | percent | 20 | 8 | 1 | 7 |
| 42 | number | 209 | 171 | 73 | 453 |
| | percent | 26 | 14 | 4 | 11 |
| 43 | number | 164 | 279 | 177 | 620 |
| | percent | 20 | 23 | 9 | 16 |
| 44 | number | 109 | 273 | 307 | 689 |
| | percent | 14 | 23 | 16 | 17 |
| 45 | number | 44 | 198 | 398 | 640 |
| | percent | 5 | 16 | 20 | 16 |
| 46 | number | 10 | 116 | 305 | 431 |
| | percent | 1 | 10 | 16 | 11 |
| 47 | number | 6 | 51 | 282 | 339 |
| | percent | 1 | 4 | 14 | 9 |
| 48 | number | 2 | 11 | 194 | 207 |
| | percent | - | 1 | 10 | 5 |
| 49 | number | - | 4 | 110 | 114 |
| | percent | - | - | 6 | 3 |
| 50 | number | - | - | 48 | 48 |
| | percent | - | - | 2 | 1 |
| 51 | number | 1 | - | 39 | 40 |
| | percent | - | - | 2 | 1 |
| Total | | 813 | 1,212 | 1,959 | 3,984 |
| Percent | | 20 | 31 | 49 | |

## Appendix table 12.

Reproductive condition of female seals sampled from commercial kill by round and age, St. Paul Island, 1959

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 27 June-1 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 2 | 1 | - | - | - | - | - | 4 |
| percent | - | - | 100 | 100 | 33 | - | - | - | - | - | 40 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| percent | - | - | - | - | 33 | 25 | - | - | - | - | 20 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | 3 | - | - | - | - | 4 |
| percent | - | - | - | - | 34 | 75 | - | - | - | - | 40 |
| Total | - | - | 1 | 2 | 3 | 4 | - | - | - | - | 10 |
| 2 - 6 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 1 | 2 | 1 | - | - | - | - | 5 |
| percent | - | - | 100 | 50 | 50 | 17 | - | - | - | - | 30 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 1 | 2 | 5 | 1 | - | 2 | 1 | 12 |
| percent | - | - | - | 50 | 50 | 83 | 100 | - | 100 | 100 | 70 |
| Total | - | - | 1 | 2 | 4 | 6 | 1 | - | 2 | 1 | 17 |
| 7 - 11 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 2 | 3 | 2 | 2 | - | - | - | - | 9 |
| percent | - | - | 100 | 100 | 50 | 50 | - | - | - | - | 56 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | - | 1 | - | - | - | - | 1 |
| percent | - | - | - | - | - | 25 | - | - | - | - | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | 1 | 1 | 1 | - | 1 | 5 |
| percent | - | - | - | - | 25 | 25 | 100 | 100 | - | 100 | 32 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | - | - | - | - | - | 1 |
| percent | - | - | - | - | 25 | - | - | - | - | - | 6 |
| Total | - | - | 2 | 3 | 4 | 4 | 1 | 1 | - | 1 | 16 |
| 12-16 July | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | - | - | 1 | - | - | - | - | - | - | 1 |
| percent | - | - | - | 16 | - | - | - | - | - | - | 3 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 4 | 8 | 3 | 1 | 1 | 1 | - | 19 |
| percent | - | - | 50 | 67 | 80 | 60 | 100 | 100 | 25 | - | 58 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 1 | - | - | - | - | - | - | 1 |
| percent | - | - | - | 17 | - | - | - | - | - | - | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | - | 2 | 2 | - | - | 2 | 2 | 9 |
| percent | - | - | 50 | - | 20 | 40 | - | - | 50 | 50 | 27 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | - | - | - | - | 1 | 2 | 3 |
| percent | - | - | - | - | - | - | - | - | 25 | 50 | 9 |
| Total | - | - | 2 | 6 | 10 | 5 | 1 | 1 | 4 | 4 | 33 |

Appendix table 12 (con.)

**Reproductive condition of female seals sampled from commercial kill by round and age, St. Paul Island, 1959**

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 17-21 July | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | - | 2 | 1 | 1 | - | - | - | 1 | - | 5 |
| percent | - | - | 100 | 9 | 7 | - | - | - | 14 | - | 6 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 9 | 12 | 6 | 1 | 1 | 1 | - | 30 |
| percent | - | - | - | 82 | 80 | 60 | 25 | 14 | 14 | - | 37 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 1 | 2 | 3 | 3 | 5 | 4 | 9 | 27 |
| percent | - | - | - | 9 | 13 | 30 | 75 | 72 | 58 | 35 | 33 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | - | 1 | - | 1 | 1 | 17 | 20 |
| percent | - | - | - | - | - | 10 | - | 14 | 14 | 65 | 24 |
| Total | - | - | 2 | 11 | 15 | 10 | 4 | 7 | 7 | 26 | 82 |
| 22-26 July | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | - | 7 | 4 | 3 | 1 | 1 | - | - | - | 16 |
| percent | - | - | 58 | 14 | 14 | 8 | 9 | - | - | - | 13 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 5 | 23 | 12 | 4 | 2 | 1 | - | - | 47 |
| percent | - | - | 42 | 82 | 57 | 31 | 19 | 12 | - | - | 39 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 1 | - | 1 | - | - | - | - | 2 |
| percent | - | - | - | 4 | - | 8 | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | - | 5 | 5 | 5 | 4 | 3 | 5 | 27 |
| percent | - | - | - | - | 24 | 38 | 45 | 44 | 60 | 24 | 23 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | 2 | 3 | 4 | 2 | 16 | 28 |
| percent | - | - | - | - | 5 | 15 | 27 | 44 | 40 | 76 | 23 |
| Total | - | - | 12 | 28 | 21 | 13 | 11 | 9 | 5 | 21 | 120 |
| 27-31 July | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | 2 | 20 | 8 | 3 | 4 | - | 1 | - | - | 38 |
| percent | - | 100 | 80 | 26 | 20 | 18 | - | 9 | - | - | 22 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 5 | 27 | 5 | 7 | 3 | 3 | 2 | - | 52 |
| percent | - | - | 20 | 68 | 34 | 32 | 27 | 27 | 20 | - | 30 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 1 | 3 | - | - | - | - | - | 4 |
| percent | - | - | - | 3 | 20 | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 1 | 3 | 9 | 5 | 2 | 3 | 11 | 34 |
| percent | - | - | - | 3 | 20 | 41 | 45 | 19 | 30 | 27 | 20 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | 2 | 3 | 5 | 5 | 30 | 46 |
| percent | - | - | - | - | 6 | 9 | 28 | 45 | 50 | 73 | 26 |
| Total | - | 2 | 25 | 37 | 15 | 22 | 11 | 11 | 10 | 41 | 174 |

## Appendix table 12 (con.)

Reproductive condition of female seals sampled from commercial kill by round and age, St. Paul Island, 1959

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 1-5 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | 4 | 51 | 14 | 9 | 3 | - | - | 1 | 1 | 83 |
| percent | - | 100 | 77 | 28 | 20 | 7 | - | - | 6 | 2 | 24 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 14 | 25 | 17 | 6 | 3 | - | - | - | 65 |
| percent | - | - | 21 | 50 | 37 | 14 | 11 | - | - | - | 19 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 1 | 3 | 3 | - | 2 | - | 2 | 11 |
| percent | - | - | - | 2 | 7 | 7 | - | 9 | - | 3 | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 7 | 13 | 17 | 13 | 10 | 7 | 23 | 90 |
| percent | - | - | - | 14 | 28 | 40 | 48 | 43 | 41 | 34 | 27 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | 1 | 3 | 4 | 14 | 11 | 11 | 9 | 41 | 94 |
| percent | - | - | 2 | 6 | 8 | 32 | 41 | 48 | 53 | 61 | 27 |
| Total | - | 4 | 66 | 50 | 46 | 43 | 27 | 23 | 17 | 67 | 343 |
| 6-10 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | 1 | 35 | 166 | 53 | 16 | 13 | 3 | - | 1 | 2 | 290 |
| percent | 100 | 100 | 83 | 40 | 17 | 12 | 4 | - | 3 | 1 | 33 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | X | - | 31 | 64 | 26 | 16 | 5 | - | - | - | 142 |
| percent | - | - | 16 | 48 | 28 | 14 | 7 | - | - | - | 17 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | 2 | 8 | 7 | 4 | 2 | - | - | 1 | 24 |
| percent | - | - | 1 | 6 | 8 | 3 | 3 | - | - | 1 | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 4 | 18 | 38 | 34 | 12 | 15 | 47 | 168 |
| percent | - | - | - | 3 | 20 | 34 | 46 | 27 | 40 | 36 | 20 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 3 | 25 | 42 | 29 | 32 | 21 | 82 | 234 |
| percent | - | - | - | 3 | 27 | 40 | 40 | 73 | 57 | 62 | 27 |
| Total | 1 | 35 | 199 | 132 | 92 | 113 | 73 | 44 | 37 | 132 | 858 |
| 11-15 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | 10 | 101 | 283 | 55 | 20 | 18 | 2 | 1 | 1 | 4 | 495 |
| percent | 100 | 99 | 86 | 40 | 16 | 12 | 3 | 2 | 2 | 2 | 40 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 44 | 69 | 42 | 29 | 7 | 4 | 1 | 3 | 199 |
| percent | - | - | 14 | 50 | 33 | 20 | 10 | 9 | 2 | 1 | 16 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 3 | 13 | 14 | 2 | 1 | - | - | 33 |
| percent | - | - | - | 2 | 10 | 9 | 3 | 2 | - | - | 3 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | 1 | - | 9 | 28 | 56 | 27 | 19 | 18 | 81 | 239 |
| percent | - | 1 | - | 6 | 22 | 38 | 40 | 41 | 40 | 37 | 19 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | 1 | 3 | 25 | 31 | 29 | 21 | 25 | 133 | 268 |
| percent | - | - | - | 2 | 19 | 21 | 44 | 46 | 56 | 60 | 22 |
| Total | 10 | 102 | 328 | 139 | 128 | 148 | 67 | 46 | 45 | 221 | 1,234 |

## Appendix table 12 (con.)

Reproductive condition of female seals sampled from commercial kill by round and age, St. Paul Island, 1959

| | Age | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | |
| 16-20 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | 19 | 112 | 293 | 51 | 14 | 7 | 2 | 1 | 1 | 2 | 502 |
| percent | 100 | 98 | 86 | 36 | 15 | 7 | 4 | 3 | 4 | + | 46 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | 2 | 40 | 64 | 32 | 19 | 4 | 2 | 1 | - | 164 |
| percent | - | 2 | 12 | 45 | 35 | 19 | 7 | 7 | 4 | - | 15 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | 5 | 9 | 3 | 6 | 2 | 1 | - | - | 26 |
| percent | - | - | 2 | 7 | 4 | 6 | 4 | 3 | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 10 | 26 | 34 | 22 | 9 | 13 | 86 | 201 |
| percent | - | - | - | 7 | 28 | 35 | 38 | 32 | 52 | 47 | 18 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | 1 | 7 | 16 | 33 | 27 | 16 | 10 | 94 | 204 |
| percent | - | - | - | 5 | 18 | 33 | 47 | 55 | 40 | 53 | 19 |
| Total | 19 | 114 | 340 | 141 | 91 | 99 | 57 | 29 | 25 | 182 | 1,097 |

## Appendix table 13.

Reproductive condition of female seals sampled from commercial kill by round and age, St. George Island, 1959

| | Age | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | |
| 27 June-11 July | (No females killed) | | | | | | | | | | |
| 12-16 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | - | - | - | - | - | 1 | 1 |
| percent | - | - | - | - | - | - | - | - | - | 100 | 100 |
| Total | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 17-21 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 1 | - | 1 | - | - | - | 2 | 4 |
| percent | - | - | - | 100 | - | 100 | - | - | - | 40 | 57 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | - | - | - | - | - | 3 | 3 |
| percent | - | - | - | - | - | - | - | - | - | 60 | 43 |
| Total | - | - | - | 1 | - | 1 | - | - | - | 5 | 7 |

## Appendix table 13 (con.)

Reproductive condition of female seals sampled from commercial kill by round and age, St. George Island, 1959

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 22-26 July | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | - | 1 | - | - | - | - | - | - | - | 1 |
| percent | - | - | 100 | - | - | - | - | - | - | - | 12 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | - | - | - | - | - | 1 |
| percent | - | - | - | - | 50 | - | - | - | - | - | 12 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 1 | - | - | - | - | - | - | 1 |
| percent | - | - | - | 100 | - | - | - | - | - | - | 13 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | - | - | - | 1 | - | - | 1 | 2 |
| percent | - | - | - | - | - | - | 50 | - | - | 100 | 25 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | 1 | - | 1 | 1 | - | - | 3 |
| percent | - | - | - | - | 50 | - | 50 | 100 | - | - | 38 |
| Total | - | - | 1 | 1 | 2 | - | 2 | 1 | - | 1 | 8 |
| 27-31 July | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | - | 3 | - | - | - | - | - | - | - | 3 |
| percent | - | - | 75 | - | - | - | - | - | - | - | 13 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 2 | 1 | - | - | - | - | - | 4 |
| percent | - | - | 25 | 100 | 25 | - | - | - | - | - | 18 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | - | 3 | 2 | 2 | 1 | - | 2 | 10 |
| percent | - | - | - | - | 75 | 67 | 100 | 100 | - | 40 | 43 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | - | 1 | - | - | 2 | 3 | 6 |
| percent | - | - | - | - | - | 33 | - | - | 100 | 60 | 26 |
| Total | - | - | 4 | 2 | 4 | 3 | 2 | 1 | 2 | 5 | 23 |
| 1-5 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | 5 | 22 | 4 | 2 | 1 | - | - | - | - | 34 |
| percent | - | 100 | 63 | 15 | 10 | 4 | - | - | - | - | 16 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 12 | 15 | 6 | 3 | - | - | 1 | 1 | 38 |
| percent | - | - | 34 | 58 | 30 | 12 | - | - | 6 | 2 | 18 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 2 | - | - | - | - | - | - | 2 |
| percent | - | - | - | 8 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 3 | 9 | 16 | 13 | 15 | 8 | 23 | 88 |
| percent | - | - | 3 | 11 | 45 | 64 | 76 | 65 | 47 | 50 | 41 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 2 | 3 | 5 | 4 | 8 | 8 | 22 | 52 |
| percent | - | - | - | 8 | 15 | 20 | 24 | 35 | 47 | 48 | 24 |
| Total | - | 5 | 35 | 26 | 20 | 25 | 17 | 23 | 17 | 46 | 214 |

## Appendix table 13 (con.)

Reproductive condition of female seals sampled from commercial kill by round and age, St. George Island, 1959

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 6-10 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | 11 | 39 | 10 | 7 | 2 | 1 | - | - | - | 70 |
| percent | - | 100 | 85 | 28 | 18 | 4 | 4 | - | - | - | 23 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 6 | 17 | 11 | 5 | 3 | - | - | - | 42 |
| percent | - | - | 13 | 47 | 28 | 11 | 11 | - | - | - | 14 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | 1 | 2 | 1 | 1 | 1 | - | - | - | 6 |
| percent | - | - | 2 | 6 | 2 | 3 | 4 | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | - | 6 | 16 | 28 | 16 | 13 | 11 | 29 | 119 |
| percent | - | - | - | 16 | 40 | 62 | 62 | 65 | 69 | 49 | 40 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 1 | 5 | 9 | 5 | 7 | 5 | 30 | 62 |
| percent | - | - | - | 3 | 12 | 20 | 19 | 35 | 31 | 51 | 21 |
| Total | - | 11 | 46 | 36 | 40 | 45 | 26 | 20 | 16 | 59 | 299 |
| 11-15 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | - | 22 | 53 | 14 | - | 1 | - | - | - | 1 | 91 |
| percent | - | 100 | 79 | 32 | - | 3 | - | - | - | 2 | 31 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 13 | 21 | 3 | 3 | 1 | - | - | - | 41 |
| percent | - | - | 19 | 48 | 14 | 9 | 6 | - | - | - | 14 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 3 | 2 | 1 | - | - | - | - | 6 |
| percent | - | - | - | 7 | 8 | 3 | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 5 | 14 | 22 | 15 | 10 | 9 | 31 | 107 |
| percent | - | - | 2 | 11 | 64 | 67 | 83 | 56 | 60 | 60 | 37 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | 1 | 3 | 6 | 2 | 8 | 6 | 20 | 46 |
| percent | - | - | - | 2 | 14 | 18 | 11 | 44 | 40 | 38 | 16 |
| Total | - | 22 | 67 | 44 | 22 | 33 | 18 | 18 | 15 | 52 | 291 |
| 16-20 August | | | | | | | | | | | |
| Nullipara | | | | | | | | | | | |
| number | 1 | 29 | 68 | 14 | 5 | 1 | - | - | - | 1 | 119 |
| percent | 100 | 100 | 77 | 28 | 14 | 3 | - | - | - | 2 | 35 |
| Primipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 17 | 24 | 7 | 3 | 1 | - | - | 1 | 53 |
| percent | - | - | 19 | 48 | 18 | 7 | 5 | - | - | 2 | 16 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | 2 | 6 | 5 | 9 | - | - | - | - | 22 |
| percent | - | - | 3 | 12 | 14 | 22 | - | - | - | - | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | | | | | | | | | | | |
| number | - | - | 1 | 6 | 12 | 19 | 11 | 7 | 7 | 22 | 85 |
| percent | - | - | 1 | 12 | 32 | 46 | 58 | 58 | 70 | 42 | 25 |
| nonpregnant | | | | | | | | | | | |
| number | - | - | - | - | 8 | 9 | 7 | 5 | 3 | 28 | 60 |
| percent | - | - | - | - | 22 | 22 | 37 | 42 | 30 | 54 | 18 |
| Total | 1 | 29 | 88 | 50 | 37 | 41 | 19 | 12 | 10 | 52 | 339 |

Appendix table 14.
Cumulative age classification of male seals in commercial kill, by day, St. George Island, 27 June to 31 July 1959

| Date | Rookery | Estimated kill from each age class | | | | | Total kill | Percent kill from each age class | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | | 2 | 3 | 4 | 5 | 6 |
| 27 June | ZAP | - | 29 | 110 | - | - | 139 | - | 21 | 79 | - | - |
| 28 | NOR | - | 57 | 166 | - | - | 223 | - | 26 | 74 | - | - |
| 29 | EAS | 12 | 109 | 270 | - | - | 391 | 3 | 28 | 69 | - | - |
| 30 | STAR | 12 | 127 | 298 | - | - | 437 | 3 | 29 | 68 | - | - |
| 1 July | NOR | 12 | 155 | 346 | 9 | - | 522 | 2 | 30 | 66 | 2 | - |
| 2 | ZAP | 12 | 185 | 435 | 9 | - | 641 | 2 | 28 | 68 | 2 | - |
| 3 | NOR | 23 | 204 | 493 | 28 | - | 748 | 3 | 27 | 66 | 4 | - |
| 4 | EAS | 23 | 253 | 649 | 37 | - | 962 | 3 | 26 | 67 | 4 | - |
| 5 | STAR | 23 | 271 | 715 | 37 | - | 1046 | 2 | 26 | 68 | 4 | - |
| 6 | NOR | 23 | 336 | 771 | 37 | 10 | 1177 | 2 | 29 | 65 | 3 | 1 |
| 7 | ZAP | 23 | 403 | 838 | 37 | 10 | 1311 | 2 | 31 | 64 | 3 | - |
| 8 | NOR | 23 | 453 | 898 | 47 | 10 | 1431 | 2 | 32 | 63 | 3 | - |
| 9 | EAS | 33 | 591 | 1055 | 57 | 10 | 1746 | 2 | 34 | 61 | 3 | - |
| 10 | STAR | 33 | 601 | 1103 | 96 | 10 | 1843 | 2 | 33 | 60 | 5 | - |
| 11 | NOR | 33 | 641 | 1183 | 96 | 10 | 1963 | 2 | 33 | 60 | 5 | - |
| 12 | ZAP | 42 | 708 | 1259 | 96 | 10 | 2115 | 2 | 33 | 60 | 5 | - |
| 13 | NOR | 42 | 757 | 1318 | 96 | 10 | 2223 | 2 | 34 | 59 | 5 | - |
| 14 | EAS | 52 | 814 | 1413 | 125 | 10 | 2414 | 2 | 34 | 59 | 5 | - |
| 15 | STAR | 62 | 832 | 1498 | 135 | 10 | 2537 | 2 | 33 | 60 | 5 | - |
| 16 | NOR | 62 | 929 | 1603 | 135 | 10 | 2739 | 2 | 34 | 59 | 5 | - |
| 17 | ZAP | 80 | 974 | 1648 | 153 | 10 | 2865 | 3 | 34 | 58 | 5 | - |
| 18 | NOR | 80 | 1021 | 1752 | 153 | 10 | 3016 | 3 | 34 | 58 | 5 | - |
| 19 | EAS | 80 | 1118 | 1885 | 153 | 10 | 3246 | 3 | 34 | 58 | 5 | - |
| 20 | STAR | 91 | 1159 | 1966 | 153 | 10 | 3379 | 3 | 34 | 58 | 5 | - |
| 21 | NOR | 91 | 1297 | 2074 | 153 | 10 | 3625 | 3 | 36 | 57 | 4 | - |
| 22 | ZAP | 100 | 1346 | 2159 | 162 | 10 | 3777 | 3 | 36 | 57 | 4 | - |
| 23 | NOR | 119 | 1397 | 2219 | 162 | 10 | 3907 | 3 | 36 | 57 | 4 | - |
| 24 | EAS | 137 | 1590 | 2365 | 162 | 10 | 4264 | 3 | 37 | 56 | 4 | - |
| 25 | STAR | 137 | 1659 | 2435 | 162 | 10 | 4403 | 3 | 38 | 55 | 4 | - |
| 26 | NOR | 174 | 1783 | 2492 | 162 | 10 | 4621 | 4 | 39 | 54 | 3 | - |
| 27 | ZAP | 174 | 1885 | 2594 | 162 | 10 | 4825 | 4 | 39 | 54 | 3 | - |
| 28 | NOR | 174 | 1967 | 2667 | 162 | 10 | 4980 | 3 | 40 | 54 | 3 | - |
| 29 | EAS | 194 | 2127 | 2734 | 162 | 10 | 5227 | 4 | 41 | 52 | 3 | - |
| 30 | STAR | 205 | 2149 | 2778 | 162 | 10 | 5304 1/ | 4 | 41 | 52 | 3 | - |
| 31 | NOR | 242 | 2251 | 2825 | 162 | 10 | 5490 1/ | 5 | 41 | 51 | 3 | - |

1/ Plus 210 unclassified male seals killed during the period 1-20 August.

# Appendix table 15.

Reproductive condition of female seals sampled from commercial kill by date and age, St. George Island, 27 June to 20 August 1959

| | Age | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
| 27 June-13 July | (No females killed) | | | | | | | | | | |
| 14 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| nonpregnant | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 18 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| nonpregnant | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 19 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | - | - | - | - | 1 | 2 |
| nonpregnant | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 20 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | - | - | - | - | 1 | 2 |
| nonpregnant | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 22 July | | | | | | | | | | | |
| Nullipara | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 24 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | - | - | - | - | 1 | 1 |
| nonpregnant | - | - | - | - | 1 | - | 1 | - | - | - | 2 |
| 26 July | | | | | | | | | | | |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | - | 1 | - | - | - | 1 |
| nonpregnant | - | - | - | - | - | - | - | 1 | - | - | 1 |
| 27 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | - | - | 1 | - | - | 2 |
| 28 July | | | | | | | | | | | |
| Nullipara | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | - | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 1 | 2 | - | - | - | 3 |
| 29 July | | | | | | | | | | | |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | - | - | - | - | 1 | 2 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | 1 | 2 |
| 31 July | | | | | | | | | | | |
| Nullipara | - | - | 2 | - | - | - | - | - | - | - | 2 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | - | 1 | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 1 | - | - | - | 1 | 3 |
| nonpregnant | - | - | - | - | - | - | - | - | 2 | 2 | 4 |
| 1 August | | | | | | | | | | | |
| Nullipara | - | - | 3 | 1 | 1 | - | - | - | - | - | 5 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | 2 | - | - | - | - | - | - | 4 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 3 | 3 | 3 | 2 | 2 | 3 | 16 |
| nonpregnant | - | - | - | - | - | 2 | 1 | 3 | 2 | 9 | 17 |
| 2 August | | | | | | | | | | | |
| Nullipara | - | - | 5 | 1 | - | - | - | - | - | - | 6 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 4 | 3 | - | - | - | - | - | - | 7 |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 2 | - | - | 2 | 1 | 7 | 12 |
| nonpregnant | - | - | - | 1 | - | 1 | 1 | - | 3 | 5 | 11 |
| 3 August | | | | | | | | | | | |
| Nullipara | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | - | - | 2 | - | - | 1 | 1 | 5 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 1 | 3 | 4 | 5 | 1 | 1 | 1 | 17 |
| nonpregnant | - | - | - | 1 | 1 | 1 | - | 2 | - | - | 5 |
| 4 August | | | | | | | | | | | |
| Nullipara | - | 4 | 9 | 1 | - | - | - | - | - | - | 14 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 5 | 7 | 3 | 1 | - | - | - | - | 16 |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | - | 5 | 3 | 5 | 2 | 8 | 24 |
| nonpregnant | - | - | - | - | 2 | - | 2 | 1 | 2 | 7 | 14 |
| 5 August | | | | | | | | | | | |
| Nullipara | - | 1 | 5 | 1 | - | - | - | - | - | - | 7 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 3 | 3 | - | - | - | - | - | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 1 | 4 | 2 | 5 | 2 | 4 | 19 |
| nonpregnant | - | - | - | - | - | 1 | - | 2 | 1 | 1 | 5 |
| 6 August | | | | | | | | | | | |
| Nullipara | - | 2 | 6 | 5 | 1 | - | - | - | - | - | 14 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 5 | 3 | 1 | - | - | - | - | 9 |
| nonpregnant | - | - | - | - | - | - | 1 | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 2 | 6 | 3 | 3 | 4 | 4 | 23 |
| nonpregnant | - | - | - | - | 1 | 1 | 2 | 1 | 2 | 4 | 11 |
| 7 August | | | | | | | | | | | |
| Nullipara | - | - | 2 | - | 2 | - | - | - | - | - | 4 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | - | 1 | 1 | - | - | - | - | 4 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | 2 | - | 2 | - | 2 | 6 |
| nonpregnant | - | - | - | - | - | 3 | - | 1 | 2 | 3 | 9 |
| 8 August | | | | | | | | | | | |
| Nullipara | - | 4 | 12 | 3 | 2 | 1 | 1 | - | - | - | 23 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 3 | 1 | 1 | 2 | - | - | - | 8 |
| nonpregnant | - | - | 1 | 1 | - | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 9 | 4 | 5 | 2 | 1 | 4 | 26 |
| nonpregnant | - | - | - | 1 | 1 | 3 | 2 | 2 | - | 10 | 19 |
| 9 August | | | | | | | | | | | |
| Nullipara | - | 4 | 15 | 2 | 2 | 1 | - | - | - | - | 24 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 3 | 8 | 2 | 2 | 1 | - | - | - | 16 |
| nonpregnant | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | 4 | 11 | 3 | 2 | 3 | 12 | 37 |
| nonpregnant | - | - | - | - | 3 | 1 | 1 | 3 | 1 | 10 | 19 |
| 10 August | | | | | | | | | | | |
| Nullipara | - | 1 | 4 | - | - | - | - | - | - | - | 5 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 4 | - | - | - | - | - | 5 |
| nonpregnant | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | 1 | 5 | 5 | 4 | 3 | 7 | 27 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | 3 | 4 |
| 11 August | | | | | | | | | | | |
| Nullipara | - | 12 | 15 | 6 | - | - | - | - | - | 1 | 34 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | 7 | 1 | - | 1 | - | - | - | 11 |
| nonpregnant | - | - | - | 2 | - | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 5 | 11 | 3 | 3 | 2 | 12 | 37 |
| nonpregnant | - | - | - | 1 | 1 | 2 | 1 | 1 | 3 | 7 | 16 |
| 12 August | | | | | | | | | | | |
| Nullipara | - | 2 | 7 | - | - | - | - | - | - | - | 9 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 6 | 1 | - | 1 | - | - | - | - | 8 |
| nonpregnant | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 2 | 1 | 1 | - | 3 | 6 | 14 |
| nonpregnant | - | - | - | - | - | 1 | - | 4 | 1 | 6 | 12 |
| 13 August | | | | | | | | | | | |
| Nullipara | - | 4 | 15 | 2 | - | - | - | - | - | - | 21 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 3 | 2 | 1 | - | - | - | - | 7 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 1 | 2 | 7 | 4 | 4 | 3 | 7 | 29 |
| nonpregnant | - | - | - | - | 2 | - | - | 1 | 1 | 3 | 7 |
| 14 August | | | | | | | | | | | |
| Nullipara | - | 1 | 7 | 2 | - | - | - | - | - | - | 10 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 3 | 1 | - | - | - | - | - | - | 4 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | - | - | 2 | - | - | 3 | 5 |
| nonpregnant | - | - | - | - | - | - | - | - | - | 2 | 2 |
| 15 August | | | | | | | | | | | |
| Nullipara | - | 3 | 9 | 4 | - | 1 | - | - | - | - | 17 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 9 | - | 1 | - | - | - | - | 11 |
| nonpregnant | - | - | - | 1 | 1 | - | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 2 | 5 | 3 | 5 | 3 | 1 | 3 | 22 |
| nonpregnant | - | - | - | - | - | 3 | 1 | 2 | 1 | 2 | 9 |
| 16 August | | | | | | | | | | | |
| Nullipara | - | 5 | 5 | 3 | 1 | - | - | - | - | 1 | 15 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 6 | 5 | 1 | 1 | 1 | - | - | 1 | 15 |
| nonpregnant | - | - | 1 | 2 | 2 | 3 | - | - | - | - | 8 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 3 | 3 | 5 | - | 2 | 2 | 8 | 23 |
| nonpregnant | - | - | - | - | 3 | - | 2 | - | 1 | 8 | 14 |
| 17 August | | | | | | | | | | | |
| Nullipara | - | 3 | 10 | 5 | - | - | - | - | - | - | 18 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 5 | 3 | 1 | 1 | - | - | - | - | 10 |
| nonpregnant | - | - | 1 | 1 | 2 | 2 | - | - | - | - | 6 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | 1 | 3 | 3 | 2 | 1 | - | 2 | 12 |
| nonpregnant | - | - | - | - | - | 2 | 2 | 1 | 1 | 3 | 9 |
| 18 August | | | | | | | | | | | |
| Nullipara | - | 2 | 14 | 2 | 2 | - | - | - | - | - | 20 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 3 | 3 | - | - | - | - | - | 7 |
| nonpregnant | - | - | - | - | - | 2 | - | - | - | - | 2 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 1 | 4 | 4 | 1 | 2 | 4 | 16 |
| nonpregnant | - | - | - | - | 2 | 2 | 2 | 2 | - | 9 | 17 |
| 19 August | | | | | | | | | | | |
| Nullipara | - | 12 | 24 | 2 | 1 | 1 | - | - | - | - | 40 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 3 | 8 | 2 | 1 | - | - | - | - | 14 |
| nonpregnant | - | - | - | 3 | 1 | 1 | - | - | - | - | 5 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | - | - | 2 | 6 | 4 | 3 | 2 | 6 | 23 |
| nonpregnant | - | - | - | - | 1 | 4 | - | 1 | - | 4 | 10 |
| 20 August | | | | | | | | | | | |
| Nullipara | 1 | 7 | 15 | 2 | 1 | - | - | - | - | - | 26 |
| Primipara | | | | | | | | | | | |
| pregnant | - | - | 2 | 5 | - | - | - | - | - | - | 7 |
| nonpregnant | - | - | - | - | - | 1 | - | - | - | - | 1 |
| Multipara | | | | | | | | | | | |
| pregnant | - | - | 1 | 2 | 3 | 1 | 1 | - | 1 | 2 | 11 |
| nonpregnant | - | - | - | - | 2 | 1 | 1 | 1 | 1 | 4 | 10 |
| Total | 1 | 67 | 241 | 161 | 125 | 147 | 84 | 75 | 60 | 221 | 1,182 |

Appendix table 16.

Age classification of male seals in commercial kill,
St. George Island, 27 June to 31 July 1959

| Date | Rookery | Males killed | Tooth sample size | Percent in each age class | | | | | Estimated number killed from age class | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 3 | 4 | 5 | 6 | 2 | 3 | 4 | 5 | 6 |
| 27 June | ZAP | 139 | 14 | - | 21 | 79 | - | - | - | 29 | 110 | - | - |
| 28 | NOR | 84 | 9 | - | 33 | 67 | - | - | - | 28 | 56 | - | - |
| 29 | EAS | 168 | 16 | 7 | 31 | 62 | - | - | 12 | 52 | 104 | - | - |
| 30 | STAR | 46 | 5 | - | 40 | 60 | - | - | - | 18 | 28 | - | - |
| 1 July | NOR | 85 | 9 | - | 33 | 56 | 11 | - | - | 28 | 48 | 9 | - |
| Round total | | 522 | 53 | - | - | - | - | - | 12 | 155 | 346 | 9 | - |
| 2 July | ZAP | 119 | 12 | - | 25 | 75 | - | - | - | 30 | 89 | - | - |
| 3 | NOR | 107 | 11 | 10 | 18 | 54 | 18 | - | 11 | 19 | 58 | 19 | - |
| 4 | EAS | 214 | 22 | - | 23 | 73 | 4 | - | - | 49 | 156 | 9 | - |
| 5 | STAR | 84 | 9 | - | 22 | 78 | - | - | - | 18 | 66 | - | - |
| 6 | NOR | 131 | 14 | - | 50 | 43 | - | 7 | - | 65 | 56 | - | 10 |
| Round total | | 655 | 68 | - | - | - | - | - | 11 | 181 | 425 | 28 | 10 |
| 7 July | ZAP | 134 | 14 | - | 50 | 50 | - | - | - | 67 | 67 | - | - |
| 8 | NOR | 120 | 12 | - | 42 | 50 | 8 | - | - | 50 | 60 | 10 | - |
| 9 | EAS | 315 | 30 | 3 | 44 | 50 | 3 | - | 10 | 138 | 157 | 10 | - |
| 10 | STAR | 97 | 10 | - | 10 | 50 | 40 | - | - | 10 | 48 | 39 | - |
| 11 | NOR | 120 | 12 | - | 33 | 67 | - | - | - | 40 | 80 | - | - |
| Round total | | 786 | 78 | - | - | - | - | - | 10 | 305 | 412 | 59 | - |
| 12 July | ZAP | 152 | 16 | 6 | 44 | 50 | - | - | 9 | 67 | 76 | - | - |
| 13 | NOR | 108 | 11 | - | 45 | 55 | - | - | - | 49 | 59 | - | - |
| 14 | EAS | 191 | 20 | 5 | 30 | 50 | 15 | - | 10 | 57 | 95 | 29 | - |
| 15 | STAR | 123 | 13 | 8 | 15 | 69 | 8 | - | 10 | 18 | 85 | 10 | - |
| 16 | NOR | 202 | 21 | - | 48 | 52 | - | - | - | 97 | 105 | - | - |
| Round total | | 776 | 81 | - | - | - | - | - | 29 | 288 | 420 | 39 | - |
| 17 July | ZAP | 126 | 14 | 14 | 36 | 36 | 14 | - | 18 | 45 | 45 | 18 | - |
| 18 | NOR | 151 | 16 | - | 31 | 69 | - | - | - | 47 | 104 | - | - |
| 19 | EAS | 230 | 24 | - | 42 | 58 | - | - | - | 97 | 133 | - | - |
| 20 | STAR | 133 | 13 | 8 | 31 | 61 | - | - | 11 | 41 | 81 | - | - |
| 21 | NOR | 246 | 25 | - | 56 | 44 | - | - | - | 138 | 108 | - | - |
| Round total | | 886 | 92 | - | - | - | - | - | 29 | 368 | 471 | 18 | - |
| 22 July | ZAP | 152 | 16 | 6 | 32 | 56 | 6 | - | 9 | 49 | 85 | 9 | - |
| 23 | NOR | 130 | 13 | 15 | 39 | 46 | - | - | 19 | 51 | 60 | - | - |
| 24 | EAS | 357 | 37 | 5 | 54 | 41 | - | - | 18 | 193 | 146 | - | - |
| 25 | STAR | 139 | 14 | - | 50 | 50 | - | - | - | 69 | 70 | - | - |
| 26 | NOR | 218 | 23 | 17 | 57 | 26 | - | - | 37 | 124 | 57 | - | - |
| Round total | | 996 | 103 | - | - | - | - | - | 83 | 486 | 418 | 9 | - |
| 27 July | ZAP | 204 | 20 | - | 50 | 50 | - | - | - | 102 | 102 | - | - |
| 28 | NOR | 155 | 17 | - | 53 | 47 | - | - | - | 82 | 73 | - | - |
| 29 | EAS | 247 | 26 | 8 | 65 | 27 | - | - | 20 | 160 | 67 | - | - |
| 30 | STAR | 77 | 7 | 14 | 29 | 57 | - | - | 11 | 22 | 44 | - | - |
| 31 | NOR | 186 | 20 | 20 | 55 | 25 | - | - | 37 | 102 | 47 | - | - |
| Round total | | 869 | 90 | - | - | - | - | - | 68 | 468 | 333 | - | - |
| Season total | | 5490 1/ | 565 | - | - | - | - | - | 242 | 2251 | 2825 | 162 | 10 |

1/ Plus 210 unclassified male seals killed during the period 1-20 August.

# Appendix table 17.

Age classification of females in commercial kill,
St. George Island, Alaska, 27 June to 20 August 1959

| Date | Rookery | Females killed | Daily sample | Number in each age class of sample | | | | | | | | | | Percent in each age class of sample | | | | | | | | | | Estimated number killed from each age class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ |
| 27 June to 11 July | | No females killed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 July | ZAP | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | NOR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 14 | EAS | 1 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | 1 |
| 15 | STAR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | NOR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Round total | | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 17 July | ZAP | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 18 | NOR | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | 1 |
| 19 | EAS | 3 | 3 | - | - | - | 1 | - | - | - | - | - | 2 | - | - | - | 33 | - | - | - | - | - | 67 | - | - | - | 1 | - | - | - | - | - | 2 |
| 20 | STAR | 3 | 3 | - | - | - | 1 | - | - | - | - | - | 2 | - | - | - | 33 | - | - | - | - | - | 67 | - | - | - | 1 | - | - | - | - | - | 2 |
| 21 | NOR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Round total | | 7 | 7 | - | - | - | 2 | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | 5 |
| 22 July | ZAP | 1 | 1 | - | - | 1 | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - |
| 23 | NOR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 24 | EAS | 4 | 4 | - | - | - | 1 | 1 | - | 1 | - | - | 1 | - | - | - | 25 | 25 | - | 25 | - | - | 25 | - | - | - | 1 | 1 | - | 1 | - | - | 1 |
| 25 | STAR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 26 | NOR | 3 | 3 | - | - | - | - | 1 | - | 1 | 1 | - | - | - | - | - | - | 33 | - | 33 | 34 | - | - | - | - | - | - | 1 | - | 1 | 1 | - | - |
| Round total | | 8 | 8 | - | - | 1 | 1 | 2 | - | 2 | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 | - | 2 | 1 | - | 1 |
| 27 July | ZAP | 2 | 2 | - | - | - | - | 1 | - | - | 1 | - | - | - | - | - | - | 50 | - | - | 50 | - | - | - | - | - | - | 1 | - | - | 1 | - | - |
| 28 | NOR | 6 | 6 | - | - | 1 | 2 | - | 1 | 2 | - | - | - | - | - | 17 | 33 | - | 17 | 33 | - | - | - | - | - | 1 | 2 | - | 1 | 2 | - | - | - |
| 29 | EAS | 4 | 4 | - | - | - | - | 1 | 1 | - | - | - | 2 | - | - | - | - | 25 | 25 | - | - | - | 50 | - | - | - | - | 1 | 1 | - | - | - | 2 |
| 30 | STAR | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 31 | NOR | 11 | 11 | - | - | 3 | - | 2 | 1 | - | - | 2 | 3 | - | - | 27 | - | 18 | 10 | - | - | 18 | 27 | - | - | 3 | - | 2 | 1 | - | - | 2 | 3 |
| Round total | | 23 | 23 | - | - | 4 | 2 | 4 | 3 | 2 | 1 | 2 | 5 | - | - | - | - | - | - | - | - | - | - | - | - | 4 | 2 | 4 | 3 | 2 | 1 | 2 | 5 |
| 1 August | ZAP | 91 | 42 | - | - | 5 | 3 | 4 | 5 | 4 | 5 | 4 | 12 | - | - | 12 | 7 | 9 | 12 | 9 | 12 | 10 | 29 | - | - | 11 | 6 | 8 | 11 | 8 | 11 | 9 | 27 |
| 2 | NOR | 97 | 37 | - | - | 9 | 6 | 2 | 1 | 1 | 2 | 4 | 12 | - | - | 24 | 16 | 5 | 3 | 3 | 5 | 11 | 33 | - | - | 23 | 15 | 5 | 3 | 3 | 5 | 11 | 32 |
| 3 | EAS | 56 | 29 | - | - | 2 | 2 | 5 | 8 | 5 | 3 | 2 | 2 | - | - | 7 | 7 | 17 | 28 | 17 | 10 | 7 | 7 | - | - | 4 | 4 | 9 | 16 | 9 | 6 | 4 | 4 |
| 4 | STAR | 180 | 69 | - | 4 | 14 | 10 | 5 | 6 | 5 | 6 | 4 | 15 | - | 6 | 20 | 14 | 7 | 9 | 7 | 9 | 6 | 22 | - | 11 | 36 | 25 | 13 | 16 | 13 | 16 | 11 | 39 |
| 5 | NOR | 96 | 37 | - | 1 | 5 | 5 | 4 | 5 | 2 | 7 | 3 | 5 | - | 3 | 13 | 13 | 11 | 14 | 5 | 19 | 8 | 14 | - | 3 | 12 | 12 | 11 | 13 | 5 | 19 | 8 | 13 |
| Round total | | 520 | 214 | - | 5 | 35 | 26 | 20 | 25 | 17 | 23 | 17 | 46 | - | - | - | - | - | - | - | - | - | - | - | 14 | 86 | 62 | 46 | 59 | 38 | 57 | 43 | 115 |
| 6 August | ZAP | 280 | 58 | - | 2 | 6 | 11 | 7 | 8 | 6 | 4 | 6 | 8 | - | 4 | 10 | 19 | 12 | 14 | 10 | 7 | 10 | 14 | - | 11 | 28 | 53 | 34 | 39 | 28 | 20 | 28 | 39 |
| 7 | NOR | 52 | 23 | - | - | 4 | - | 3 | 6 | - | 3 | 2 | 5 | - | - | 17 | - | 13 | 26 | - | 13 | 9 | 22 | - | - | 9 | - | 7 | 13 | - | 7 | 5 | 11 |
| 8 | EAS | 195 | 78 | - | 4 | 14 | 9 | 13 | 9 | 10 | 4 | 1 | 14 | - | 5 | 18 | 12 | 16 | 12 | 13 | 5 | 1 | 18 | - | 10 | 35 | 23 | 31 | 23 | 26 | 10 | 2 | 35 |
| 9 | STAR | 265 | 97 | - | 4 | 18 | 13 | 11 | 15 | 5 | 5 | 4 | 22 | - | 4 | 19 | 13 | 11 | 16 | 5 | 5 | 4 | 23 | - | 11 | 50 | 35 | 29 | 42 | 13 | 13 | 11 | 61 |
| 10 | NOR | 116 | 43 | - | 1 | 4 | 3 | 6 | 7 | 5 | 4 | 3 | 10 | - | 3 | 9 | 7 | 14 | 16 | 12 | 9 | 7 | 23 | - | 4 | 10 | 8 | 16 | 19 | 14 | 10 | 8 | 27 |
| Round total | | 908 | 299 | - | 11 | 46 | 36 | 40 | 45 | 26 | 20 | 16 | 59 | - | - | - | - | - | - | - | - | - | - | - | 36 | 132 | 119 | 117 | 136 | 81 | 60 | 54 | 173 |
| 11 August | ZAP | 591 | 100 | - | 12 | 17 | 17 | 7 | 13 | 5 | 4 | 5 | 20 | - | 12 | 17 | 17 | 7 | 13 | 5 | 4 | 5 | 20 | - | 71 | 100 | 100 | 41 | 77 | 30 | 24 | 30 | 118 |
| 12 | NOR | 198 | 44 | - | 2 | 13 | 2 | 3 | 3 | 1 | 4 | 4 | 12 | - | 5 | 29 | 5 | 7 | 7 | 2 | 9 | 9 | 27 | - | 10 | 57 | 10 | 14 | 14 | 4 | 18 | 18 | 53 |
| 13 | EAS | 305 | 65 | - | 4 | 17 | 6 | 6 | 9 | 4 | 5 | 4 | 10 | - | 6 | 26 | 9 | 9 | 14 | 6 | 8 | 6 | 16 | - | 18 | 79 | 28 | 28 | 43 | 18 | 24 | 18 | 49 |
| 14 | STAR | 117 | 21 | - | 1 | 10 | 3 | - | - | 2 | - | - | 5 | - | 5 | 48 | 14 | - | - | 9 | - | - | 24 | - | 6 | 56 | 16 | - | - | 11 | - | - | 28 |
| 15 | NOR | 151 | 61 | - | 3 | 10 | 16 | 6 | 8 | 6 | 5 | 2 | 5 | - | 5 | 17 | 26 | 10 | 13 | 10 | 8 | 3 | 8 | - | 8 | 26 | 39 | 15 | 20 | 15 | 12 | 4 | 12 |
| Round total | | 1362 | 291 | - | 22 | 67 | 44 | 22 | 33 | 18 | 18 | 15 | 52 | - | - | - | - | - | - | - | - | - | - | - | 113 | 318 | 193 | 98 | 154 | 78 | 78 | 70 | 260 |
| 16 August | ZAP | 366 | 75 | - | 5 | 12 | 13 | 10 | 9 | 3 | 2 | 3 | 18 | - | 7 | 16 | 17 | 13 | 12 | 4 | 3 | 4 | 24 | - | 26 | 58 | 62 | 47 | 44 | 15 | 11 | 15 | 88 |
| 17 | NOR | 143 | 55 | - | 3 | 16 | 10 | 6 | 8 | 4 | 2 | 1 | 5 | - | 5 | 29 | 18 | 11 | 15 | 7 | 4 | 2 | 9 | - | 7 | 41 | 26 | 16 | 21 | 10 | 6 | 3 | 13 |
| 18 | EAS | 153 | 62 | - | 2 | 15 | 5 | 8 | 8 | 6 | 3 | 2 | 13 | - | 3 | 24 | 8 | 13 | 13 | 10 | 5 | 3 | 21 | - | 5 | 37 | 12 | 20 | 20 | 15 | 7 | 5 | 32 |
| 19 | STAR | 230 | 92 | - | 12 | 27 | 13 | 7 | 13 | 4 | 4 | 2 | 10 | - | 13 | 29 | 14 | 8 | 14 | 4 | 4 | 3 | 11 | - | 30 | 67 | 32 | 19 | 32 | 9 | 9 | 7 | 25 |
| 20 | NOR | 134 | 55 | 1 | 7 | 18 | 9 | 6 | 3 | 2 | 1 | 2 | 6 | 2 | 12 | 33 | 16 | 11 | 5 | 4 | 2 | 4 | 11 | 3 | 16 | 44 | 21 | 15 | 7 | 5 | 3 | 5 | 15 |
| Round total | | 1026 | 339 | 1 | 29 | 88 | 50 | 37 | 41 | 19 | 12 | 10 | 52 | - | - | - | - | - | - | - | - | - | - | 3 | 84 | 247 | 153 | 117 | 124 | 54 | 36 | 35 | 173 |
| Season total | | 3855 | 1182 | 1 | 67 | 241 | 161 | 125 | 147 | 84 | 75 | 60 | 221 | - | - | - | - | - | - | - | - | - | - | 3 | 247 | 788 | 532 | 384 | 476 | 255 | 233 | 204 | 733 |

# Appendix table 18.

Cumulative age classification of female seals in commercial kill, by day,
St. George Island, 27 June to 20 August 1959

| Date | Rookery | Number killed from age class | | | | | | | | | | Total killed | Percent killed from age class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ |
| June | | | | | | | | | | | | | | | | | | | | | | |
| 27-30 | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | |
| 1-13 | | No females killed | | | | | | | | | | | | | | | | | | | | |
| 14 | EAS | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | 100 |
| 15 | STAR | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | 100 |
| 16 | NOR | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | 100 |
| 17 | ZAP | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | 100 |
| 18 | NOR | - | - | - | - | - | - | - | - | - | 2 | 2 | - | - | - | - | - | - | - | - | - | 100 |
| 19 | EAS | - | - | - | 1 | - | - | - | - | - | 4 | 5 | - | - | - | 20 | - | - | - | - | - | 80 |
| 20 | STAR | - | - | - | 2 | - | - | - | - | - | 6 | 8 | - | - | - | 25 | - | - | - | - | - | 75 |
| 21 | NOR | - | - | - | 2 | - | - | - | - | - | 6 | 8 | - | - | - | 25 | - | - | - | - | - | 75 |
| 22 | ZAP | - | - | 1 | 2 | - | - | - | - | - | 6 | 9 | - | - | 11 | 22 | - | - | - | - | - | 67 |
| 23 | NOR | - | - | 1 | 2 | - | - | - | - | - | 6 | 9 | - | - | 11 | 22 | - | - | - | - | - | 67 |
| 24 | EAS | - | - | 1 | 3 | 1 | - | 1 | - | - | 7 | 13 | - | - | 8 | 23 | 8 | - | 8 | - | - | 53 |
| 25 | STAR | - | - | 1 | 3 | 1 | - | 1 | - | - | 7 | 13 | - | - | 8 | 23 | 8 | - | 8 | - | - | 53 |
| 26 | NOR | - | - | 1 | 3 | 2 | - | 2 | 1 | - | 7 | 16 | - | - | 6 | 19 | 13 | - | 12 | 6 | - | 44 |
| 27 | ZAP | - | - | 1 | 3 | 3 | - | 2 | 2 | - | 7 | 18 | - | - | 5 | 17 | 17 | - | 11 | 11 | - | 39 |
| 28 | NOR | - | - | 2 | 5 | 3 | 1 | 4 | 2 | - | 7 | 24 | - | - | 8 | 21 | 13 | 4 | 17 | 8 | - | 29 |
| 29 | EAS | - | - | 2 | 5 | 4 | 2 | 4 | 2 | - | 9 | 28 | - | - | 7 | 18 | 14 | 7 | 14 | 7 | - | 33 |
| 30 | STAR | - | - | 2 | 5 | 4 | 2 | 4 | 2 | - | 9 | 28 | - | - | 7 | 18 | 14 | 7 | 14 | 7 | - | 33 |
| 31 | NOR | - | - | 5 | 5 | 6 | 3 | 4 | 2 | 2 | 12 | 39 | - | - | 13 | 13 | 15 | 8 | 10 | 5 | 5 | 31 |
| Aug. | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ZAP | - | - | 16 | 11 | 14 | 14 | 12 | 13 | 11 | 39 | 130 | - | - | 13 | 8 | 11 | 11 | 9 | 10 | 8 | 30 |
| 2 | NOR | - | - | 39 | 26 | 19 | 17 | 15 | 18 | 22 | 71 | 227 | - | - | 17 | 12 | 8 | 7 | 7 | 8 | 10 | 31 |
| 3 | EAS | - | - | 43 | 30 | 28 | 33 | 24 | 24 | 26 | 75 | 283 | - | - | 15 | 11 | 10 | 12 | 8 | 8 | 9 | 27 |
| 4 | STAR | - | 11 | 79 | 55 | 41 | 49 | 37 | 40 | 37 | 114 | 463 | - | 2 | 17 | 12 | 9 | 10 | 8 | 9 | 8 | 25 |
| 5 | NOR | - | 14 | 91 | 67 | 52 | 62 | 42 | 59 | 45 | 127 | 559 | - | 2 | 16 | 12 | 9 | 11 | 8 | 11 | 8 | 23 |
| 6 | ZAP | - | 25 | 119 | 120 | 86 | 101 | 70 | 79 | 73 | 166 | 839 | - | 3 | 14 | 14 | 10 | 12 | 8 | 10 | 9 | 20 |
| 7 | NOR | - | 25 | 128 | 120 | 93 | 114 | 70 | 86 | 78 | 177 | 891 | - | 3 | 14 | 13 | 10 | 13 | 8 | 10 | 9 | 20 |
| 8 | EAS | - | 35 | 163 | 143 | 124 | 137 | 96 | 96 | 80 | 212 | 1086 | - | 3 | 15 | 13 | 11 | 13 | 9 | 9 | 7 | 20 |
| 9 | STAR | - | 46 | 213 | 178 | 153 | 179 | 109 | 109 | 91 | 273 | 1351 | - | 4 | 16 | 13 | 11 | 13 | 8 | 8 | 7 | 20 |
| 10 | NOR | - | 50 | 223 | 186 | 169 | 198 | 123 | 119 | 99 | 300 | 1467 | - | 3 | 15 | 13 | 12 | 14 | 8 | 8 | 7 | 20 |
| 11 | ZAP | - | 121 | 323 | 286 | 210 | 275 | 153 | 143 | 129 | 418 | 2058 | - | 6 | 16 | 14 | 10 | 13 | 8 | 7 | 6 | 20 |
| 12 | NOR | - | 131 | 380 | 296 | 224 | 289 | 157 | 161 | 147 | 471 | 2256 | - | 6 | 17 | 13 | 10 | 13 | 7 | 7 | 6 | 21 |
| 13 | EAS | - | 149 | 459 | 324 | 252 | 332 | 175 | 185 | 165 | 520 | 2561 | - | 6 | 18 | 13 | 9 | 13 | 7 | 7 | 7 | 20 |
| 14 | STAR | - | 155 | 515 | 340 | 252 | 332 | 186 | 185 | 165 | 548 | 2678 | - | 6 | 19 | 13 | 10 | 12 | 7 | 7 | 6 | 20 |
| 15 | NOR | - | 163 | 541 | 379 | 267 | 352 | 201 | 197 | 169 | 560 | 2829 | - | 6 | 19 | 13 | 10 | 12 | 7 | 7 | 6 | 20 |
| 16 | ZAP | - | 189 | 599 | 441 | 314 | 396 | 216 | 208 | 184 | 648 | 3195 | - | 6 | 19 | 14 | 10 | 12 | 7 | 6 | 6 | 20 |
| 17 | NOR | - | 196 | 640 | 467 | 330 | 417 | 226 | 214 | 187 | 661 | 3338 | - | 6 | 19 | 14 | 10 | 12 | 7 | 6 | 6 | 20 |
| 18 | EAS | - | 201 | 677 | 479 | 350 | 437 | 241 | 221 | 192 | 693 | 3491 | - | 6 | 19 | 14 | 10 | 13 | 7 | 6 | 5 | 20 |
| 19 | STAR | - | 231 | 744 | 511 | 369 | 469 | 250 | 230 | 199 | 718 | 3721 | - | 6 | 20 | 14 | 10 | 13 | 7 | 6 | 5 | 19 |
| 20 | NOR | 3 | 247 | 788 | 532 | 384 | 476 | 255 | 233 | 204 | 733 | 3855 | - | 6 | 21 | 14 | 10 | 12 | 7 | 6 | 5 | 19 |

# Appendix table 19.

Number pregnant and nonpregnant among female seals 4 or more years old and 5 or more years old, St. George Island, 1959

| Date | Daily kill | Daily sample | Daily sample less 2 & 3 yr. olds | Ages 4-10+ | | Daily sample less 2, 3, & 4 yr. olds | Ages 5-10+ | |
|---|---|---|---|---|---|---|---|---|
| | | | | pregnant | non-pregnant | | pregnant | non-pregnant |
| 27 June-13 July | | No females killed | | | | | | |
| 14 July | 1 | 1 | 1 | - | 1 | 1 | - | 1 |
| 15 | - | - | - | - | - | - | - | - |
| 16 | - | - | - | - | - | - | - | - |
| 17 | - | - | - | - | - | - | - | - |
| 18 | 1 | 1 | 1 | - | 1 | 1 | - | 1 |
| 19 | 3 | 3 | 3 | 2 | 1 | 3 | 2 | 1 |
| 20 | 3 | 3 | 3 | 2 | 1 | 3 | 2 | 1 |
| 21 | - | - | - | - | - | - | - | - |
| 22 | 1 | 1 | 1 | - | 1 | - | - | - |
| 23 | - | - | - | - | - | - | - | - |
| 24 | 4 | 4 | 4 | 1 | 3 | 4 | 1 | 3 |
| 25 | - | - | - | - | - | - | - | - |
| 26 | 3 | 3 | 3 | 2 | 1 | 3 | 2 | 1 |
| 27 | 2 | 2 | 2 | 2 | - | 2 | 2 | - |
| 28 | 6 | 6 | 6 | 5 | 1 | 5 | 5 | - |
| 29 | 4 | 4 | 4 | 2 | 2 | 4 | 2 | 2 |
| 30 | - | - | - | - | - | - | - | - |
| 31 | 11 | 11 | 11 | 5 | 6 | 8 | 4 | 4 |
| 1 August | 91 | 42 | 42 | 20 | 22 | 37 | 18 | 19 |
| 2 | 97 | 37 | 37 | 19 | 18 | 28 | 15 | 13 |
| 3 | 56 | 29 | 29 | 22 | 7 | 27 | 20 | 7 |
| 4 | 180 | 69 | 65 | 40 | 25 | 51 | 35 | 16 |
| 5 | 96 | 37 | 36 | 25 | 11 | 31 | 25 | 6 |
| 6 | 280 | 58 | 56 | 32 | 24 | 50 | 32 | 18 |
| 7 | 52 | 23 | 23 | 10 | 13 | 19 | 8 | 11 |
| 8 | 195 | 78 | 74 | 34 | 40 | 60 | 33 | 27 |
| 9 | 265 | 97 | 93 | 53 | 40 | 75 | 50 | 25 |
| 10 | 116 | 43 | 42 | 32 | 10 | 38 | 32 | 6 |
| 11 | 591 | 100 | 88 | 48 | 40 | 71 | 46 | 25 |
| 12 | 198 | 44 | 42 | 22 | 20 | 29 | 16 | 13 |
| 13 | 305 | 65 | 61 | 36 | 25 | 44 | 34 | 10 |
| 14 | 117 | 21 | 20 | 9 | 11 | 10 | 6 | 4 |
| 15 | 151 | 61 | 58 | 33 | 25 | 48 | 32 | 16 |
| 16 | 366 | 75 | 70 | 38 | 32 | 58 | 32 | 26 |
| 17 | 143 | 55 | 52 | 22 | 30 | 36 | 17 | 19 |
| 18 | 153 | 62 | 60 | 23 | 37 | 45 | 22 | 23 |
| 19 | 230 | 92 | 80 | 37 | 43 | 53 | 34 | 19 |
| 20 | 134 | 55 | 47 | 18 | 29 | 29 | 15 | 14 |
| Total | 3,855 | 1,182 | 1,114 | 594 | 520 | 873 | 542 | 331 |

Appendix table 20.
Length of female seals sampled from commercial kill,
by age, St. George Island, 1959

| Length in inches | | Age 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | number | - | - | 2 | 1 | - | - | - | - | - | - | 3 |
| | percent | - | - | 1 | 1 | - | - | - | - | - | - | - |
| 37 | number | - | - | - | - | - | - | - | - | - | - | - |
| | percent | - | - | - | - | - | - | - | - | - | - | - |
| 38 | number | - | 1 | - | - | - | - | - | - | - | - | 1 |
| | percent | - | 2 | - | - | - | - | - | - | - | - | - |
| 39 | number | - | 1 | - | - | - | - | - | - | - | - | 1 |
| | percent | - | 2 | - | - | - | - | - | - | - | - | - |
| 40 | number | - | 9 | 1 | 1 | 1 | - | - | - | - | - | 12 |
| | percent | - | 13 | - | 1 | 1 | - | - | - | - | - | - |
| 41 | number | 1 | 23 | 28 | 4 | - | 1 | 1 | 1 | - | 1 | 60 |
| | percent | 100 | 34 | 12 | 2 | - | 1 | 1 | 1 | - | - | 5 |
| 42 | number | - | 20 | 92 | 30 | 10 | 11 | 5 | 1 | 3 | 9 | 181 |
| | percent | - | 30 | 38 | 19 | 8 | 8 | 6 | 1 | 5 | 4 | 15 |
| 43 | number | - | 10 | 59 | 43 | 15 | 30 | 9 | 4 | 5 | 11 | 186 |
| | percent | - | 15 | 25 | 26 | 12 | 20 | 11 | 5 | 8 | 5 | 16 |
| 44 | number | - | 3 | 44 | 38 | 45 | 41 | 23 | 21 | 13 | 41 | 269 |
| | percent | - | 4 | 18 | 24 | 36 | 28 | 28 | 28 | 22 | 19 | 23 |
| 45 | number | - | - | 13 | 30 | 31 | 35 | 22 | 19 | 18 | 58 | 226 |
| | percent | - | - | 6 | 19 | 25 | 23 | 26 | 26 | 30 | 26 | 19 |
| 46 | number | - | - | 1 | 10 | 17 | 23 | 14 | 19 | 11 | 45 | 140 |
| | percent | - | - | - | 6 | 13 | 15 | 17 | 26 | 18 | 20 | 12 |
| 47 | number | - | - | - | 2 | 6 | 6 | 6 | 10 | 9 | 34 | 73 |
| | percent | - | - | - | 1 | 5 | 4 | 7 | 13 | 15 | 16 | 6 |
| 48 | number | - | - | 1 | 1 | - | 1 | 2 | - | 1 | 16 | 22 |
| | percent | - | - | - | 1 | - | 1 | 2 | - | 2 | 7 | 2 |
| 49 | number | - | - | - | - | - | - | 2 | - | - | 6 | 8 |
| | percent | - | - | - | - | - | - | 2 | - | - | 3 | 1 |
| 50 | number | - | - | - | - | - | - | - | - | - | - | - |
| | percent | - | - | - | - | - | - | - | - | - | - | - |
| 51 | number | - | - | - | - | - | - | - | - | - | - | - |
| | percent | - | - | - | - | - | - | - | - | - | - | - |
| Total | | 1 | 67 | 241 | 160 | 125 | 148 | 84 | 75 | 60 | 221 | 1,182 |
| Percent | | - | 6 | 20 | 14 | 11 | 12 | 7 | 6 | 5 | 19 | |

Appendix table 21.
Reproductive condition of female seals sampled from commercial kill, by length, St. George Island, 1959

| Length in inches | | Nullipara | Primipara pregnant | Primipara non-pregnant | Multipara pregnant | Multipara non-pregnant | Total |
|---|---|---|---|---|---|---|---|
| 36 | number | 1 | 2 | - | - | - | 3 |
| | percent | - | 1 | - | - | - | - |
| 37 | number | - | - | - | - | - | - |
| | percent | - | - | - | - | - | - |
| 38 | number | 1 | - | - | - | - | 1 |
| | percent | - | - | - | - | - | - |
| 39 | number | 1 | - | - | - | - | 1 |
| | percent | - | - | - | - | - | - |
| 40 | number | 10 | 1 | - | - | 1 | 12 |
| | percent | 3 | - | - | - | - | 1 |
| 41 | number | 49 | 7 | - | 3 | 1 | 60 |
| | percent | 16 | 4 | - | 1 | - | 5 |
| 42 | number | 104 | 41 | 7 | 22 | 7 | 181 |
| | percent | 33 | 23 | 19 | 5 | 3 | 15 |
| 43 | number | 68 | 44 | 6 | 48 | 20 | 186 |
| | percent | 22 | 25 | 16 | 12 | 9 | 16 |
| 44 | number | 59 | 42 | 8 | 107 | 53 | 269 |
| | percent | 19 | 24 | 22 | 26 | 23 | 23 |
| 45 | number | 20 | 26 | 10 | 113 | 57 | 226 |
| | percent | 6 | 15 | 27 | 27 | 24 | 19 |
| 46 | number | 3 | 13 | 5 | 70 | 49 | 140 |
| | percent | 1 | 7 | 13 | 17 | 21 | 12 |
| 47 | number | 1 | 2 | 1 | 42 | 27 | 73 |
| | percent | - | 1 | 3 | 10 | 12 | 6 |
| 48 | number | 1 | 1 | - | 6 | 14 | 22 |
| | percent | - | - | - | 1 | 6 | 2 |
| 49 | number | - | - | - | 4 | 4 | 8 |
| | percent | - | - | - | 1 | 2 | 1 |
| 50 | number | - | - | - | - | - | - |
| | percent | - | - | - | - | - | - |
| 51 | number | - | - | - | - | - | - |
| | percent | - | - | - | - | - | - |
| Total | | 318 | 179 | 37 | 415 | 233 | 1,182 |
| Percent | | 27 | 15 | 3 | 35 | 20 | |

Appendix table 22.
Vibrissal color of female seals sampled from commercial kill, by length, St. George Island, 1959

| Length in inches | | Vibrissal color | | | Total |
|---|---|---|---|---|---|
| | | black | black-and-white | white | |
| 36 | number | 1 | 1 | 1 | 3 |
| | percent | - | - | - | - |
| 37 | number | - | - | - | - |
| | percent | - | - | - | - |
| 38 | number | 1 | - | - | 1 |
| | percent | - | - | - | - |
| 39 | number | 1 | - | - | 1 |
| | percent | - | - | - | - |
| 40 | number | 8 | 3 | 1 | 12 |
| | percent | 4 | 2 | - | 1 |
| 41 | number | 44 | 12 | 4 | 60 |
| | percent | 19 | 7 | - | 5 |
| 42 | number | 87 | 47 | 47 | 181 |
| | percent | 38 | 26 | 6 | 15 |
| 43 | number | 47 | 41 | 98 | 186 |
| | percent | 21 | 22 | 13 | 16 |
| 44 | number | 33 | 39 | 197 | 269 |
| | percent | 14 | 21 | 26 | 23 |
| 45 | number | 7 | 26 | 193 | 226 |
| | percent | 3 | 14 | 25 | 19 |
| 46 | number | 3 | 10 | 127 | 140 |
| | percent | 1 | 6 | 17 | 12 |
| 47 | number | - | 3 | 70 | 73 |
| | percent | - | 2 | 9 | 6 |
| 48 | number | - | - | 22 | 22 |
| | percent | - | - | 3 | 2 |
| 49 | number | - | - | 8 | 8 |
| | percent | - | - | 1 | 1 |
| 50 | number | - | - | - | - |
| | percent | - | - | - | - |
| 51 | number | - | - | - | - |
| | percent | - | - | - | - |
| Total | | 232 | 182 | 768 | 1,182 |
| Percent | | 20 | 15 | 65 | |

# Appendix table 23.

Summary length classes of tagged and tag-lost 3- and 4-year-old male seals, by rookery of recovery, Pribilof Islands, Alaska, 1959

| Length in inches | Tags recovered | | | | | | | | | | | | | Tags lost | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | St. Paul | | | | | | | St. George | | | | | Grand | St. Paul | | | | | | | St. George | | | | | Grand |
| | ZAP | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP | total | total | ZAP | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP | total | total |
| **Age 3** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | 6 | 1 | - | 1 | 3 | 1 | 12 | - | 1 | - | - | 1 | 13 | 1 | - | - | 1 | 1 | 2 | 3 | - | - | - | - | - | 3 |
| 41 | 50 | 14 | 5 | 4 | 19 | 23 | 115 | 3 | 4 | - | 1 | 8 | 123 | 8 | 1 | - | - | 1 | 4 | 14 | 1 | 2 | 2 | - | 5 | 19 |
| 42 | 54 | 14 | 1 | 4 | 20 | 21 | 114 | 8 | 7 | 7 | 5 | 27 | 141 | 9 | 2 | 1 | - | - | 2 | 14 | 3 | 1 | 2 | 3 | 9 | 23 |
| 43 | 57 | 10 | 6 | 1 | 12 | 24 | 110 | 6 | 8 | 1 | 4 | 19 | 129 | 11 | 1 | - | 1 | 1 | 3 | 17 | 3 | - | - | 1 | 4 | 21 |
| 44 | 21 | 4 | 4 | 1 | 6 | 24 | 60 | 3 | 6 | 1 | 2 | 12 | 72 | 4 | 1 | - | - | 1 | 2 | 8 | 2 | - | - | - | 2 | 10 |
| 45 | 14 | - | 3 | - | 2 | 12 | 31 | 3 | - | - | 3 | 6 | 37 | 2 | 2 | - | - | - | 1 | 5 | - | 1 | - | - | 1 | 6 |
| 46 | 3 | - | - | 1 | 1 | 5 | 10 | - | 1 | - | - | 1 | 11 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | 1 | - | - | 1 | - | 1 | 3 | 2 | - | - | - | 2 | 5 | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| 48 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 207 | 43 | 19 | 13 | 63 | 113 | 458 | 25 | 27 | 9 | 15 | 76 | 534 | 35 | 7 | 1 | 1 | 4 | 13 | 61 | 10 | 4 | 4 | 4 | 22 | 83 |
| **Age 4** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | 2 | 2 | 1 | - | 4 | 1 | 10 | - | - | - | - | - | 10 | - | - | - | - | 2 | - | 2 | - | - | - | - | - | 2 |
| 42 | 12 | 6 | 4 | 3 | 11 | 7 | 43 | 1 | 1 | - | - | 2 | 45 | - | 1 | - | - | 1 | - | 2 | 1 | - | - | - | 1 | 3 |
| 43 | 51 | 7 | 5 | 4 | 15 | 12 | 94 | 1 | 1 | - | - | 2 | 96 | 10 | 1 | 1 | 2 | - | 1 | 15 | - | - | - | - | - | 15 |
| 44 | 57 | 12 | 7 | 9 | 33 | 18 | 136 | - | 6 | 1 | 1 | 8 | 144 | 10 | 2 | 1 | 2 | 4 | 10 | 29 | - | - | - | - | - | 29 |
| 45 | 60 | 20 | 6 | 11 | 25 | 44 | 166 | 1 | 3 | - | 3 | 7 | 173 | 9 | 2 | 2 | 6 | 2 | 6 | 27 | - | - | - | - | - | 27 |
| 46 | 51 | 15 | 4 | 8 | 19 | 42 | 139 | 3 | 3 | 1 | 1 | 8 | 147 | 6 | 3 | 1 | 1 | 5 | 6 | 22 | - | - | - | - | - | 22 |
| 47 | 28 | 11 | 3 | 13 | 15 | 41 | 111 | - | 2 | - | 1 | 3 | 114 | - | 2 | - | 1 | 4 | 4 | 11 | - | - | - | - | - | 11 |
| 48 | 12 | 4 | 1 | 4 | 4 | 29 | 54 | - | - | - | 1 | 1 | 55 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| 49 | 7 | 2 | - | 2 | 2 | 8 | 21 | - | 1 | - | 1 | 2 | 23 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| 50 | - | - | 1 | - | - | 3 | 4 | - | - | - | - | - | 4 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 51 | - | - | - | 1 | - | 1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 281 | 79 | 32 | 55 | 128 | 206 | 781 | 6 | 17 | 2 | 8 | 33 | 814 | 35 | 11 | 5 | 12 | 18 | 32 | 113 | 1 | - | - | - | 1 | 114 |

# Appendix table 24.

Summary of length classes of tagged and tag-lost 3- and 4-year-old female seals, by rookery of recovery, Pribilof Islands, Alaska 1959

| Length in inches | Tags recovered | | | | | | | | | | | | | Tags lost | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | St. Paul | | | | | | | St. George | | | | | Grand | St. Paul | | | | | | | St. George | | | | | Grand |
| | ZAP | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP | total | total | ZAP | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP | total | total |
| **Age 3** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 39 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | 1 | 2 | - | 1 | 2 | 4 | 10 | - | - | 1 | - | 1 | 11 | - | - | - | 1 | 1 | - | 2 | 1 | - | - | - | 1 | 3 |
| 41 | 5 | 3 | - | 1 | 6 | 4 | 19 | 1 | 1 | - | 2 | 4 | 23 | 4 | 1 | - | 1 | 2 | 2 | 10 | - | 1 | 1 | - | 2 | 12 |
| 42 | 6 | 3 | - | 2 | 4 | 5 | 20 | - | - | 2 | 1 | 3 | 23 | - | - | - | 1 | 2 | - | 3 | - | - | - | - | - | 3 |
| 43 | 2 | - | - | - | 4 | 1 | 7 | - | 1 | - | - | 1 | 8 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 44 | 1 | - | - | - | 1 | 1 | 3 | - | - | - | - | - | 3 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 45 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 15 | 9 | - | 4 | 18 | 16 | 62 | 1 | 2 | 3 | 3 | 9 | 71 | 4 | 1 | - | 4 | 6 | 2 | 17 | 1 | 1 | 1 | - | 3 | 20 |
| **Age 4** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | - | 1 | - | - | 1 | - | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | 1 | - | - | 3 | 2 | 1 | 7 | - | - | - | - | - | 7 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 41 | 12 | 10 | - | 7 | 12 | 8 | 49 | - | 1 | - | - | 1 | 50 | 8 | 1 | - | - | - | - | 9 | - | - | - | - | - | 9 |
| 42 | 26 | 11 | - | 13 | 25 | 16 | 91 | - | - | - | - | - | 91 | 6 | 1 | - | 2 | 4 | 4 | 17 | - | - | - | - | - | 17 |
| 43 | 22 | 12 | - | 7 | 16 | 26 | 83 | - | - | - | - | - | 83 | 9 | - | - | 2 | 4 | 2 | 17 | - | - | - | - | - | 17 |
| 44 | 15 | 9 | - | 8 | 11 | 20 | 63 | - | - | - | 1 | 1 | 64 | 4 | 1 | - | - | 2 | 2 | 9 | - | - | - | - | - | 9 |
| 45 | 7 | 2 | - | 5 | 9 | 12 | 35 | - | - | - | - | - | 35 | 2 | 1 | - | 1 | - | 1 | 5 | - | - | - | - | - | 5 |
| 46 | 2 | 1 | - | 2 | 3 | 4 | 12 | - | - | - | - | - | 12 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 47 | 2 | - | - | - | - | 1 | 3 | - | - | - | - | - | 3 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 87 | 46 | - | 45 | 79 | 88 | 345 | - | 1 | - | 1 | 2 | 347 | 30 | 4 | - | 6 | 11 | 9 | 60 | - | - | - | - | - | 60 |

# Appendix table 25.

Length classes of tagged and tag-lost 3-year-old male seals, by rookery of recovery and by round, Pribilof Islands, Alaska, 1959

| Length in inches | Tags recovered: St. Paul ZAP | TOL | L-K | REEF | POL | NEP | Total | St. George NOR | EAST | STAR | ZAP | Total | Grand total | Tags lost: St. Paul ZAP | TOL | L-K | REEF | POL | NEP | Total | St. George NOR | EAST | STAR | ZAP | Total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round number 1** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | - | - | - | - | - | 1 | 1 | - | 1 | - | - | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | 5 | - | - | - | - | 1 | 6 | 1 | 1 | 1 | 1 | - | 6 | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 43 | 4 | - | - | - | 1 | - | 5 | - | - | - | - | - | 5 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 44 | 1 | - | - | - | 1 | 2 | 4 | - | - | - | - | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 46 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 10 | 1 | - | - | 2 | 7 | 20 | - | 1 | - | - | 1 | 21 | 2 | - | - | - | - | 1 | 3 | - | - | - | 1 | 1 | 4 |
| **Round number 2** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | 1 | - | - | - | - | 1 | 2 | - | 1 | - | - | 1 | 3 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 41 | 6 | - | - | - | 1 | 3 | 10 | - | - | - | - | - | 10 | 1 | - | - | - | - | - | 1 | 1 | 1 | - | - | 2 | 3 |
| 42 | 2 | 2 | - | - | 1 | 1 | 6 | 1 | - | 2 | 1 | 4 | 10 | - | 1 | - | - | - | 1 | 2 | - | - | 1 | 2 | 3 | 5 |
| 43 | 4 | 1 | - | - | 1 | 1 | 7 | - | 1 | - | - | 1 | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | 1 | 1 | - | - | - | 1 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| Total | 15 | 4 | - | - | 3 | 8 | 30 | 1 | 3 | 2 | 1 | 7 | 37 | 1 | 1 | - | - | - | 2 | 4 | 2 | 1 | 1 | 2 | 6 | 10 |
| **Round number 3** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | 2 | - | - | - | 1 | - | 3 | - | - | - | - | - | 3 | 1 | - | - | - | 1 | - | 2 | - | - | - | - | - | 2 |
| 41 | 6 | 2 | 1 | - | 2 | 1 | 12 | - | 1 | - | 1 | 2 | 14 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| 42 | 11 | 2 | - | 2 | 1 | 3 | 19 | 1 | 1 | - | - | 2 | 21 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 43 | 9 | - | 1 | - | - | 6 | 16 | - | 2 | - | - | 2 | 18 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 44 | 1 | - | - | - | 1 | 1 | 3 | - | 1 | - | - | 1 | 4 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| 45 | 1 | - | - | - | - | 3 | 4 | - | - | - | - | - | 4 | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 |
| 46 | - | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | - | - | - | 1 | - | - | 1 | 1 | - | - | - | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 30 | 4 | 2 | 3 | 5 | 17 | 61 | 2 | 5 | - | 1 | 8 | 69 | 4 | - | - | - | 1 | 4 | 9 | - | 1 | - | - | 1 | 10 |
| **Round number 4** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | 13 | - | - | - | 5 | - | 18 | - | - | - | - | - | 18 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 42 | 7 | 1 | 1 | - | 2 | - | 11 | 1 | - | - | - | 1 | 12 | 1 | - | 1 | - | - | - | 2 | - | 1 | - | 1 | 3 |
| 43 | 8 | 1 | 2 | - | 1 | - | 12 | - | - | - | 3 | 3 | 15 | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| 44 | 1 | - | 1 | - | 1 | - | 3 | 1 | 1 | - | - | 2 | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | 1 | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 29 | 2 | 5 | 1 | 9 | - | 46 | 2 | 1 | - | 3 | 6 | 52 | 2 | - | 1 | - | - | - | 3 | 1 | 1 | - | - | 2 | 5 |
| **Round number 5** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | 5 | 7 | 1 | 2 | 2 | - | 17 | 2 | 1 | - | - | 3 | 20 | 1 | 1 | - | - | - | 1 | 3 | - | - | 1 | - | 1 | 4 |
| 42 | 8 | 2 | - | - | 5 | 5 | 20 | 2 | 3 | 1 | 2 | 8 | 28 | 2 | 1 | - | - | - | - | 3 | 2 | - | 1 | - | 3 | 6 |
| 43 | 14 | - | - | - | 4 | 4 | 22 | - | 2 | - | - | 2 | 24 | 3 | - | - | - | 1 | 1 | 5 | 1 | - | - | - | 1 | 6 |
| 44 | 4 | - | - | - | - | 8 | 12 | - | 2 | - | - | 2 | 14 | 2 | - | - | - | 1 | - | 3 | - | - | - | - | - | 3 |
| 45 | 7 | - | - | - | 1 | 2 | 10 | 2 | - | - | - | 2 | 12 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 41 | 9 | 1 | 2 | 12 | 19 | 84 | 6 | 8 | 1 | 2 | 17 | 101 | 8 | 2 | - | - | 2 | 2 | 14 | 3 | - | 2 | - | 5 | 19 |
| **Round number 6** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | 2 | - | - | - | 2 | - | 4 | - | - | - | - | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | 19 | 1 | - | - | 7 | 13 | 40 | 1 | - | - | - | 1 | 41 | 1 | - | - | - | 1 | 1 | 3 | - | 1 | 1 | - | 2 | 5 |
| 42 | 14 | 1 | - | - | 9 | 6 | 30 | 3 | 1 | 3 | 2 | 9 | 39 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | 3 |
| 43 | 8 | 2 | 1 | - | 4 | 5 | 20 | 4 | 2 | - | - | 6 | 26 | 2 | 1 | - | - | - | - | 3 | - | - | - | - | - | 3 |
| 44 | 4 | 1 | 1 | 1 | 1 | 2 | 10 | 1 | 1 | 1 | 1 | 4 | 14 | 1 | - | - | - | - | - | 1 | 1 | - | - | - | 1 | 2 |
| 45 | 1 | - | 1 | - | 1 | - | 3 | - | - | - | 1 | 1 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 48 | 5 | 3 | 1 | 24 | 26 | 107 | 10 | 4 | 4 | 4 | 22 | 129 | 7 | 1 | - | - | 1 | 1 | 10 | 1 | 1 | 1 | - | 3 | 13 |
| **Round number 7** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | - | 3 | 3 | 2 | - | 4 | 12 | - | 1 | - | - | 1 | 13 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 42 | 6 | 5 | - | 2 | 2 | 4 | 19 | - | 2 | 1 | - | 3 | 22 | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| 43 | 8 | 3 | 1 | 1 | 1 | 7 | 21 | 2 | 1 | - | - | 3 | 24 | 2 | - | - | - | - | 1 | 3 | 1 | - | - | 1 | 2 | 5 |
| 44 | 8 | 1 | 2 | - | 2 | 9 | 22 | 1 | 1 | - | 1 | 3 | 25 | 1 | - | - | - | - | - | 1 | 1 | - | - | - | 1 | 2 |
| 45 | 4 | - | 1 | - | - | 4 | 9 | 1 | - | - | 2 | 3 | 12 | 2 | 2 | - | - | - | - | 4 | - | - | - | - | - | 4 |
| 46 | 1 | - | - | - | 1 | 1 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 48 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 27 | 12 | 7 | 5 | 6 | 31 | 88 | 4 | 5 | 1 | 3 | 13 | 101 | 7 | 2 | - | - | - | 1 | 10 | 3 | - | - | 1 | 4 | 14 |
| **Round number 8** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 43 | 1 | - | - | - | - | - | 1 | - | - | 1 | - | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 3 | - | - | - | - | - | 3 | - | - | 1 | - | 1 | 4 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| **Round number 9** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 42 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | - | - | 1 | - | - | - | 1 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 44 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 2 | 1 | 1 | - | - | 3 | 7 | - | - | - | - | - | 7 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| **Round number 10** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | - | 1 | - | - | - | 1 | 2 | - | - | - | 1 | 1 | 3 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| 44 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| Total | - | 1 | - | - | - | 2 | 3 | - | - | - | 1 | 1 | 4 | 2 | 1 | - | - | - | 1 | 4 | - | - | - | - | - | 4 |
| **Round number 11** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | - | - | - | - | 2 | - | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | 1 | 2 | - | - | - | - | 3 | - | - | - | - | - | 3 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 44 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 2 | 4 | - | 1 | 2 | - | 9 | - | - | - | - | - | 9 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| Grand total | 207 | 43 | 19 | 13 | 63 | 113 | 458 | 25 | 27 | 9 | 15 | 76 | 534 | 35 | 7 | 1 | 1 | 4 | 13 | 61 | 10 | 4 | 4 | 4 | 22 | 83 |

# Appendix table 26.

Length classes of tagged and tag-lost 4-year-old male seals, by rookery of recovery and by round, Pribilof Islands, Alaska 1959

| Length in inches | Tags recovered: St. Paul ZAP | TOL | L-K | REEF | POL | NEP | Total | St. George NOR | EAST | STAR | ZAP | Total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round number 1** | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | 3 | 1 | - | 1 | - | 2 | 7 | - | 1 | - | - | 1 | 8 |
| 44 | 4 | - | 1 | 1 | 3 | 1 | 10 | - | - | - | - | - | 10 |
| 45 | 8 | 2 | 3 | 2 | 3 | 8 | 26 | 1 | 2 | - | 2 | 5 | 31 |
| 46 | 8 | - | - | 1 | 3 | 9 | 21 | - | 1 | - | - | 1 | 22 |
| 47 | 6 | 3 | - | 4 | 1 | 3 | 17 | - | - | - | 1 | 1 | 18 |
| 48 | 2 | - | 1 | - | 2 | 2 | 7 | - | - | - | - | - | 7 |
| 49 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 50 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 33 | 6 | 5 | 9 | 12 | 26 | 91 | 1 | 4 | - | 3 | 8 | 99 |
| **Round number 2** | | | | | | | | | | | | | |
| 40 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 41 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 42 | 2 | - | - | - | 3 | 1 | 6 | - | 1 | - | - | 1 | 7 |
| 43 | 4 | - | - | - | 5 | 3 | 12 | 1 | - | - | - | 1 | 13 |
| 44 | 7 | 2 | 2 | 1 | 5 | 7 | 24 | - | - | - | - | - | 24 |
| 45 | 9 | 7 | - | - | 5 | 9 | 30 | - | - | - | 1 | 1 | 31 |
| 46 | 2 | 7 | 1 | - | - | 6 | 16 | - | 1 | - | - | 1 | 17 |
| 47 | 5 | 5 | - | 2 | 2 | - | 14 | - | - | - | - | - | 14 |
| 48 | - | 1 | - | 1 | - | - | 2 | - | - | - | - | - | 2 |
| 49 | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 50 | - | - | 1 | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 31 | 23 | 4 | 4 | 21 | 26 | 109 | 1 | 2 | - | 1 | 4 | 113 |
| **Round number 3** | | | | | | | | | | | | | |
| 41 | - | 1 | 1 | - | 2 | 1 | 5 | - | - | - | - | - | 5 |
| 42 | 2 | - | - | - | 3 | 1 | 6 | - | - | - | - | - | 6 |
| 43 | 11 | 2 | 2 | - | 3 | 6 | 24 | - | - | - | - | - | 24 |
| 44 | 8 | 2 | 3 | 3 | 4 | 10 | 30 | - | 1 | - | - | 1 | 31 |
| 45 | 12 | 3 | 2 | 1 | 2 | 9 | 29 | - | 1 | - | - | 1 | 30 |
| 46 | 8 | 2 | - | - | 2 | 14 | 26 | 2 | 1 | - | 1 | 4 | 30 |
| 47 | 3 | 1 | 1 | 3 | 2 | 14 | 24 | - | 2 | - | - | 2 | 26 |
| 48 | 2 | - | - | - | 1 | 3 | 6 | - | - | - | - | - | 6 |
| 49 | 2 | - | - | 1 | - | 1 | 4 | - | - | - | - | - | 4 |
| 50 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 51 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| Total | 48 | 11 | 9 | 9 | 19 | 60 | 156 | 2 | 5 | - | 1 | 8 | 164 |
| **Round number 4** | | | | | | | | | | | | | |
| 41 | 1 | - | - | - | 1 | - | 2 | - | - | - | - | - | 2 |
| 42 | 5 | - | - | - | 4 | - | 9 | 1 | - | - | - | 1 | 10 |
| 43 | 19 | - | - | - | 4 | - | 23 | - | - | - | - | - | 23 |
| 44 | 17 | 1 | 1 | 1 | 7 | - | 27 | - | 4 | 1 | - | 5 | 32 |
| 45 | 16 | 1 | - | 3 | 3 | - | 23 | - | - | - | - | - | 23 |
| 46 | 6 | - | 2 | 1 | 6 | - | 15 | 1 | - | 1 | - | 2 | 17 |
| 47 | 2 | - | 1 | 2 | 1 | - | 6 | - | - | - | - | - | 6 |
| 48 | 2 | 1 | - | 1 | - | - | 4 | - | - | - | 1 | 1 | 5 |
| Total | 68 | 3 | 4 | 8 | 26 | - | 109 | 2 | 4 | 2 | 1 | 9 | 118 |
| **Round number 5** | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 42 | - | 2 | 1 | 3 | - | 1 | 7 | - | - | - | - | - | 7 |
| 43 | 5 | 2 | - | - | - | - | 7 | - | - | - | - | - | 7 |
| 44 | 4 | 1 | - | 2 | 1 | 8 | 16 | - | 1 | - | - | 1 | 17 |
| 45 | 4 | 1 | - | 3 | 6 | 5 | 19 | - | - | - | - | - | 19 |
| 46 | 11 | 1 | - | - | 4 | 6 | 22 | - | - | - | - | - | 22 |
| 47 | 6 | - | - | - | 3 | 10 | 19 | - | - | - | - | - | 19 |
| 48 | 4 | 1 | - | - | 1 | 2 | 8 | - | - | - | - | - | 8 |
| 49 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 34 | 8 | 1 | 8 | 15 | 33 | 99 | - | 1 | - | - | 1 | 100 |
| **Round number 6** | | | | | | | | | | | | | |
| 40 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 41 | 1 | - | - | - | - | 3 | 4 | - | - | - | - | - | 4 |
| 42 | 3 | 2 | 1 | - | 1 | 7 | 14 | - | - | - | - | - | 14 |
| 43 | 9 | - | 1 | 2 | 3 | 7 | 22 | - | - | - | - | - | 22 |
| 44 | 15 | 1 | - | 1 | 10 | 12 | 39 | - | - | - | - | - | 39 |
| 45 | 6 | 3 | 1 | 2 | 6 | 3 | 21 | - | - | - | - | - | 21 |
| 46 | 11 | 1 | 1 | 5 | 2 | 1 | 21 | - | - | - | - | - | 21 |
| 47 | 5 | 2 | 1 | 2 | 2 | 1 | 13 | - | - | - | - | - | 13 |
| 48 | 1 | 1 | - | 2 | - | - | 4 | - | - | - | - | - | 4 |
| 49 | 1 | 1 | - | 1 | - | - | 3 | - | - | - | - | - | 3 |
| Total | 52 | 11 | 5 | 15 | 24 | 35 | 142 | - | - | - | - | - | 142 |
| **Round number 7** | | | | | | | | | | | | | |
| 42 | - | 2 | 2 | - | - | 2 | 6 | - | - | - | - | - | 6 |
| 43 | - | 2 | 2 | 1 | - | - | 5 | - | - | - | - | - | 5 |
| 44 | 2 | 4 | - | - | 3 | 5 | 14 | - | - | - | 1 | 1 | 15 |
| 45 | 5 | 3 | - | - | - | 8 | 16 | - | - | - | - | - | 16 |
| 46 | 5 | 1 | - | 1 | 2 | 4 | 13 | - | - | - | - | - | 13 |
| 47 | 1 | - | - | - | 4 | 1 | 6 | - | - | - | - | - | 6 |
| 48 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| 49 | 1 | - | - | - | 2 | 2 | 5 | - | 1 | - | 1 | 2 | 7 |
| Total | 15 | 12 | 4 | 2 | 11 | 23 | 67 | - | 1 | - | 2 | 3 | 70 |
| **Round number 8** | | | | | | | | | | | | | |
| 46 | - | 2 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| **Round number 10** | | | | | | | | | | | | | |
| 43 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 44 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 46 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | - | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 |
| **Round number 11** | | | | | | | | | | | | | |
| 41 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 45 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | - | 3 | - | - | - | - | 3 | - | - | - | - | - | 3 |
| Grand total | 281 | 79 | 32 | 55 | 128 | 206 | 781 | 6 | 17 | 2 | 8 | 33 | 814 |

| Length in inches | Tags lost: St. Paul ZAP | TOL | L-K | REEF | POL | NEP | Total | St. George NOR | EAST | STAR | ZAP | Total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round number 1** | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | - | - | 1 | - | - | - | 1 | - | - | - | - | - | 1 |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | 1 | - | 1 | 1 | 2 | - | 5 | - | - | - | - | - | 5 |
| 45 | 4 | - | 1 | 2 | 1 | - | 8 | - | - | - | - | - | 8 |
| 46 | 1 | - | - | - | 3 | - | 4 | - | - | - | - | - | 4 |
| 47 | 1 | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 48 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 49 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 50 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | 6 | 1 | 2 | 4 | 6 | 1 | 20 | - | - | - | - | - | 20 |
| **Round number 2** | | | | | | | | | | | | | |
| 40 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | 1 | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 42 | 1 | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 43 | 1 | 1 | - | 1 | - | - | 3 | - | - | - | - | - | 3 |
| 44 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| 45 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 46 | 1 | 1 | - | - | - | 2 | 4 | - | - | - | - | - | 4 |
| 47 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 48 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 49 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 50 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 3 | 2 | 1 | 1 | 3 | 4 | 13 | - | - | - | - | - | 13 |
| **Round number 3** | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 42 | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| 43 | 3 | - | - | 1 | - | 1 | 5 | - | - | - | - | - | 5 |
| 44 | 4 | - | - | - | - | 1 | 5 | - | - | - | - | - | 5 |
| 45 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 46 | 2 | - | - | - | - | 2 | 4 | - | - | - | - | - | 4 |
| 47 | 1 | 1 | - | - | 1 | 1 | 3 | - | - | - | - | - | 3 |
| 48 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 49 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 50 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 51 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 10 | 1 | - | 1 | 2 | 5 | 19 | 1 | - | - | - | 1 | 20 |
| **Round number 4** | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | 5 | - | - | - | - | - | 5 | - | - | - | - | - | 5 |
| 44 | 2 | - | - | 1 | 1 | - | 4 | - | - | - | - | - | 4 |
| 45 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 46 | 1 | - | - | - | - | 2 | 3 | - | - | - | - | - | 3 |
| 47 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 48 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 49 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | 8 | 3 | 1 | 1 | 1 | - | 14 | - | - | - | - | - | 14 |
| **Round number 5** | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | 1 | 1 | - | - | 1 | 4 | 7 | - | - | - | - | - | 7 |
| 45 | 1 | - | - | 3 | - | 1 | 5 | - | - | - | - | - | 5 |
| 46 | 1 | - | - | 1 | 1 | 3 | 5 | - | - | - | - | - | 5 |
| 47 | 1 | - | - | - | 1 | 1 | 2 | - | - | - | - | - | 2 |
| 48 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 49 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | 3 | 1 | - | 4 | 3 | 11 | 21 | - | - | - | - | - | 21 |
| **Round number 6** | | | | | | | | | | | | | |
| 40 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | 1 | - | 1 | - | - | - | 2 | - | - | - | - | - | 2 |
| 44 | 3 | - | - | - | - | 3 | 6 | - | - | - | - | - | 6 |
| 45 | 1 | 1 | 2 | - | 1 | 1 | 6 | - | - | - | - | - | 6 |
| 46 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 47 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 48 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 49 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 6 | 2 | 1 | 1 | 1 | 5 | 16 | - | - | - | - | - | 16 |
| **Round number 7** | | | | | | | | | | | | | |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| 45 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| 46 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 47 | 2 | 2 | - | - | - | - | 4 | - | - | - | - | - | 4 |
| 48 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 49 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 2 | 3 | - | - | - | 5 | 10 | - | - | - | - | - | 10 |
| **Round number 8** | | | | | | | | | | | | | |
| 46 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Round number 10** | | | | | | | | | | | | | |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Round number 11** | | | | | | | | | | | | | |
| 41 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Grand total | 35 | 11 | 5 | 12 | 18 | 32 | 113 | 1 | - | - | - | 1 | 114 |

No recoveries made during round 9

# Appendix table 27.

Length classes of tagged and tag-lost 3-year-old female seals, by rookery of recovery and by round, Pribilof Islands, Alaska, 1959

| Length in inches | Tags recovered | | | | | | | | | | | | | | Tags lost | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | St. Paul | | | | | | | St. George | | | | | Grand | | St. Paul | | | | | | | St. George | | | | | Grand |
| | ZAP | TOL | L-K | REEF | POL | NEP | Total | NOR | EAST | STAR | ZAP | Total | total | | ZAP | TOL | L-K | REEF | POL | NEP | Total | NOR | EAST | STAR | ZAP | Total | total |
| **Round number 8** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| 41 | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 |
| Total | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | - | 1 | - | 1 | - | 2 | 2 |
| **Round number 9** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | - | - | - | 1 | - | 1 | 2 | - | - | - | - | - | 2 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | - | 1 | - | - | 1 | - | 2 | - | - | - | - | - | 2 | | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 42 | 1 | 1 | - | - | - | - | 2 | - | - | - | 1 | 1 | 3 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 2 | 2 | - | 1 | 2 | 1 | 8 | - | - | - | 1 | 1 | 9 | | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| **Round number 10** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | 1 | 1 | - | - | 1 | 2 | 5 | - | - | - | - | - | 5 | | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 41 | 5 | 2 | - | 1 | 1 | 1 | 10 | - | 1 | - | 2 | 3 | 13 | | 2 | - | - | - | - | 1 | 3 | - | 1 | - | - | 1 | 4 |
| 42 | 4 | - | - | 1 | 1 | 1 | 7 | - | - | - | - | - | 7 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 43 | 1 | - | - | - | 1 | - | 2 | - | - | - | - | - | 2 | | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 44 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 | | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 45 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 12 | 3 | - | 2 | 5 | 5 | 27 | - | 1 | - | 2 | 3 | 30 | | 2 | - | - | 1 | 2 | 1 | 6 | - | 1 | - | - | 1 | 7 |
| **Round number 11** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 39 | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | - | 1 | - | - | 1 | 1 | 3 | - | - | 1 | - | 1 | 4 | | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 41 | - | - | - | - | 4 | 3 | 7 | 1 | - | - | - | 1 | 8 | | - | 1 | - | 1 | 2 | 1 | 5 | - | - | - | - | - | 5 |
| 42 | 1 | 2 | - | 1 | 3 | 4 | 11 | - | - | 2 | - | 2 | 13 | | - | - | - | 1 | 2 | - | 3 | - | - | - | - | - | 3 |
| 43 | - | - | - | - | 3 | 1 | 4 | - | 1 | - | - | 1 | 5 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 1 | 4 | - | 1 | 11 | 10 | 27 | 1 | 1 | 3 | - | 5 | 32 | | - | 1 | - | 3 | 4 | 1 | 9 | - | - | - | - | - | 9 |
| Grand total | 15 | 9 | - | 4 | 18 | 16 | 62 | 1 | 2 | 3 | 3 | 9 | 71 | | 4 | 1 | - | 4 | 6 | 2 | 17 | 1 | 1 | 1 | - | 3 | 20 |

# Appendix table 28.

Length classes of tagged and tag-lost 4-year-old female seals, by rookery of recovery and by round, Pribilof Islands, Alaska, 1959

| Length in inches | Tags recovered | | | | | | | | | | | | | Tags lost | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | St. Paul | | | | | | | St. George | | | | | Grand | St. Paul | | | | | | | St. George | | | | Grand |
| | ZAP | TOL | L-K | REEF | POL | NEP | Total | NOR | EAST | STAR | ZAP | Total | total | ZAP | TOL | L-K | REEF | POL | NEP | Total | NOR | EAST | STAR | ZAP | Total | total |
| Round number 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Round number 6 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Round number 7 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 44 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Round number 8 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | 1 | 1 | - | 1 | 4 | 1 | 8 | - | - | - | - | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | 4 | - | - | - | - | - | 4 | - | - | - | - | - | 4 | 3 | - | - | 1 | - | - | 4 | - | - | - | - | - | 4 |
| 43 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 44 | - | 3 | - | - | - | - | 3 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 45 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 5 | 4 | - | 1 | 4 | 1 | 15 | - | - | - | - | - | 15 | 4 | - | - | 1 | - | - | 5 | - | - | - | - | - | 5 |
| Round number 9 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | 3 | 2 | - | - | 1 | 1 | 7 | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 42 | 3 | 4 | - | - | 4 | 1 | 12 | - | - | - | - | - | 12 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| 43 | 9 | 2 | - | 1 | 4 | 9 | 25 | - | - | - | - | - | 25 | 3 | - | - | - | 1 | 1 | 5 | - | - | - | - | - | 5 |
| 44 | 8 | - | - | - | 1 | 3 | 12 | - | - | - | 1 | 1 | 13 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | 3 |
| 45 | 3 | - | - | - | 2 | 5 | 10 | - | - | - | - | - | 10 | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| 46 | 2 | - | - | - | 1 | - | 3 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 47 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 30 | 8 | - | 1 | 14 | 19 | 72 | - | - | - | 1 | 1 | 73 | 7 | - | - | - | 1 | 3 | 11 | - | - | - | - | - | 11 |
| Round number 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | 1 | - | - | - | 1 | 1 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 41 | 8 | 1 | - | 1 | 4 | 4 | 18 | - | 1 | - | - | 1 | 19 | 7 | - | - | - | - | - | 7 | - | - | - | - | - | 7 |
| 42 | 19 | 1 | - | 4 | 10 | 4 | 38 | - | - | - | - | - | 38 | 1 | - | - | 1 | 2 | 1 | 5 | - | - | - | - | - | 5 |
| 43 | 12 | 2 | - | 3 | 2 | 6 | 25 | - | - | - | - | - | 25 | 2 | - | - | 1 | 2 | 1 | 6 | - | - | - | - | - | 6 |
| 44 | 5 | 1 | - | 6 | 4 | 3 | 19 | - | - | - | - | - | 19 | 1 | 1 | - | - | 1 | 1 | 4 | - | - | - | - | - | 4 |
| 45 | 4 | 2 | - | 3 | 3 | 2 | 14 | - | - | - | - | - | 14 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 46 | - | 1 | - | 1 | 2 | 1 | 5 | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 49 | 8 | - | 18 | 27 | 21 | 123 | - | 1 | - | - | 1 | 124 | 11 | 1 | - | 3 | 5 | 3 | 23 | - | - | - | - | - | 23 |
| Round number 11 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 40 | - | - | - | 3 | - | - | 3 | - | - | - | - | - | 3 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| 41 | - | 6 | - | 5 | 2 | 2 | 15 | - | - | - | - | - | 15 | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 42 | - | 6 | - | 9 | 11 | 11 | 37 | - | - | - | - | - | 37 | 2 | 1 | - | - | 2 | 2 | 7 | - | - | - | - | - | 7 |
| 43 | 1 | 8 | - | 3 | 10 | 11 | 33 | - | - | - | - | - | 33 | 3 | - | - | 1 | 1 | - | 5 | - | - | - | - | - | 5 |
| 44 | 2 | 5 | - | 2 | 5 | 14 | 28 | - | - | - | - | - | 28 | - | - | - | - | 1 | 1 | 2 | - | - | - | - | - | 2 |
| 45 | - | - | - | 2 | 4 | 5 | 11 | - | - | - | - | - | 11 | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 46 | - | - | - | 1 | - | 2 | 3 | - | - | - | - | - | 3 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| 47 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 3 | 26 | - | 25 | 32 | 46 | 132 | - | - | - | - | - | 132 | 7 | 3 | - | 2 | 5 | 3 | 20 | - | - | - | - | - | 20 |
| Grand total | 87 | 46 | - | 45 | 79 | 88 | 345 | - | 1 | - | 1 | 2 | 347 | 30 | 4 | - | 6 | 11 | 9 | 60 | - | - | - | - | - | 60 |

# Appendix table 29.

Recovery location of tagged seals in commercial kill, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island | | | | | | | St. George Island | | | | | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ZAP-1 | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP-2 | total | |
| **J-series - 2-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 12 | 1 | 1 | - | 2 | 2 | 18 | - | - | - | 1 | 1 | 19 |
| TOL | 8 | - | - | 1 | 1 | 2 | 12 | - | - | - | - | - | 12 |
| L-K | - | - | 1 | - | 1 | 5 | 7 | - | - | - | - | - | 7 |
| REEF | 8 | - | - | 2 | 4 | 4 | 18 | - | - | - | 1 | 1 | 19 |
| POL | 3 | 3 | - | 1 | 21 | 4 | 32 | 1 | 2 | - | 1 | 4 | 36 |
| NEP | 5 | - | 1 | - | 2 | 19 | 27 | - | 1 | 1 | 2 | 4 | 31 |
| NOR | 1 | - | 1 | - | 2 | 1 | 5 | 4 | - | 2 | - | 6 | 11 |
| EAST | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| STAR | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| ZAP-2 | - | 2 | - | - | - | 2 | 4 | - | 1 | 1 | - | 2 | 6 |
| Total | 39 | 6 | 4 | 4 | 33 | 40 | 126 | 5 | 4 | 4 | 5 | 18 | 144 |
| **I-series - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 60 | 7 | 5 | 1 | 2 | 7 | 82 | - | 1 | 2 | 2 | 5 | 87 |
| TOL | 35 | 12 | 3 | 1 | 5 | 6 | 62 | 2 | 1 | 1 | - | 4 | 66 |
| L-K | 4 | 3 | 4 | - | 3 | 5 | 19 | 2 | 1 | - | - | 3 | 22 |
| REEF | 60 | 12 | 4 | 11 | 8 | 17 | 112 | - | 2 | 1 | 1 | 4 | 116 |
| POL | 7 | 4 | - | - | 21 | 11 | 43 | - | - | - | 2 | 2 | 45 |
| NEP | 18 | 3 | 2 | - | 17 | 63 | 103 | 1 | 3 | - | 1 | 5 | 108 |
| NOR | 9 | 2 | - | - | 2 | - | 13 | 14 | 1 | 1 | 1 | 17 | 30 |
| EAST | 1 | - | - | - | 3 | - | 4 | 1 | 15 | 1 | - | 17 | 21 |
| STAR | 4 | - | - | - | 2 | 1 | 7 | 4 | 1 | 2 | - | 7 | 14 |
| ZAP-2 | 9 | - | 1 | - | - | 3 | 13 | 1 | 2 | 1 | 8 | 12 | 25 |
| Total | 207 | 43 | 19 | 13 | 63 | 113 | 458 | 25 | 27 | 9 | 15 | 76 | 534 |
| **H-series - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 105 | 19 | 2 | - | 8 | 16 | 150 | - | 3 | - | 2 | 5 | 155 |
| TOL | 49 | 20 | 2 | - | 5 | 8 | 84 | 2 | 5 | - | 1 | 8 | 92 |
| L-K | 8 | 2 | 18 | 2 | 5 | 10 | 45 | - | 2 | - | - | 2 | 47 |
| REEF | 103 | 31 | 8 | 53 | 18 | 38 | 251 | 2 | 3 | - | 5 | 10 | 261 |
| POL | 6 | 2 | 2 | - | 86 | 28 | 124 | 1 | 2 | 1 | - | 4 | 128 |
| NEP | 10 | 5 | - | - | 6 | 106 | 127 | 1 | 2 | 1 | - | 4 | 131 |
| Total | 281 | 79 | 32 | 55 | 128 | 206 | 781 | 6 | 17 | 2 | 8 | 33 | 814 |
| **G-series - 5-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | 2 | - | 3 | - | - | - | - | - | 3 |
| TOL | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | 1 | - | - | 1 | 1 | - | 3 | - | 1 | - | - | 1 | 4 |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | 2 | 1 | - | 1 | 4 | 1 | 9 | - | 1 | - | - | 1 | 10 |
| **F-series - 6-year-old seals, males** | | | | | | | | | | | | | |
| REEF | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| **E-series - 7-year-old seals, males** | | | | | | | | | | | | | |
| POL | - | - | - | - | 2 | - | 2 | - | - | - | - | - | 2 |
| **J-series - 2-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| Total | - | - | - | - | 1 | 2 | 3 | - | - | - | - | - | 3 |

# Appendix table 29 (con.)

Recovery location of tagged seals in commercial kill, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **I-series - 3-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 3 | 2 | - | - | 1 | - | 6 | - | - | - | - | - | 6 |
| TOL | 5 | 6 | - | - | 1 | - | 12 | - | - | - | - | - | 12 |
| REEF | 3 | - | - | 4 | 1 | 3 | 11 | - | 1 | - | 1 | 2 | 13 |
| POL | 1 | - | - | - | 9 | 3 | 13 | - | - | - | - | - | 13 |
| NEP | 2 | 1 | - | - | 4 | 10 | 17 | - | - | 1 | - | 1 | 18 |
| NOR | - | - | - | - | 1 | - | 1 | 1 | - | - | - | 1 | 2 |
| EAST | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 |
| STAR | 1 | - | - | - | - | - | 1 | - | - | 1 | - | 1 | 2 |
| ZAP-2 | - | - | - | - | 1 | - | 1 | - | - | 1 | 2 | 3 | 4 |
| Total | 15 | 9 | - | 4 | 18 | 16 | 62 | 1 | 2 | 3 | 3 | 9 | 71 |
| **H-series - 4-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 52 | 16 | - | - | 1 | 4 | 73 | - | 1 | - | 1 | 2 | 75 |
| TOL | 9 | 17 | - | - | 6 | 2 | 34 | - | - | - | - | - | 34 |
| L-K | 4 | - | - | - | 4 | 4 | 12 | - | - | - | - | - | 12 |
| REEF | 12 | 12 | - | 45 | 3 | 12 | 84 | - | - | - | - | - | 84 |
| POL | 3 | 1 | - | - | 63 | 8 | 75 | - | - | - | - | - | 75 |
| NEP | 7 | - | - | - | 2 | 58 | 67 | - | - | - | - | - | 67 |
| Total | 87 | 46 | - | 45 | 79 | 88 | 345 | - | 1 | - | 1 | 2 | 347 |
| **G-series - 5-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 5 | - | - | - | - | - | 5 | - | - | - | - | - | 5 |
| TOL | 8 | 3 | - | - | - | - | 11 | - | - | - | - | - | 11 |
| L-K | 1 | 5 | - | - | - | - | 6 | - | - | - | - | - | 6 |
| REEF | 4 | - | - | 5 | 2 | 3 | 14 | - | - | - | - | - | 14 |
| POL | - | - | - | - | 7 | 3 | 10 | - | - | - | - | - | 10 |
| NEP | - | 2 | - | - | 1 | 10 | 13 | - | - | - | - | - | 13 |
| Total | 18 | 10 | - | 5 | 10 | 16 | 59 | - | - | - | - | - | 59 |
| **F-series - 6-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 3 | 1 | - | - | - | - | 4 | - | - | - | - | - | 4 |
| TOL | 2 | 3 | - | - | - | - | 5 | - | - | - | - | - | 5 |
| L-K | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| REEF | - | 3 | - | 3 | - | 1 | 7 | - | - | - | - | - | 7 |
| POL | - | - | - | - | 5 | - | 5 | - | - | - | - | - | 5 |
| NEP | - | - | - | - | - | 8 | 8 | - | - | - | 1 | 1 | 9 |
| Total | 5 | 7 | - | 3 | 5 | 10 | 30 | - | - | - | 1 | 1 | 31 |
| **E-series - 7-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| REEF | 6 | 3 | - | 5 | 1 | 1 | 16 | - | - | - | - | - | 16 |
| POL | - | 1 | - | - | 41 | 20 | 62 | - | - | - | - | - | 62 |
| NEP | - | - | - | - | - | 28 | 28 | - | - | - | - | - | 28 |
| Total | 7 | 5 | - | 5 | 42 | 49 | 108 | - | - | - | - | - | 108 |
| **D-series - 8-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 5 | 1 | 6 | - | - | - | - | - | 6 |
| **CS-series - 10-year-old seals, females** | | | | | | | | | | | | | |
| REEF | 3 | - | - | 1 | - | - | 4 | - | - | - | 1 | 1 | 5 |
| POL | - | - | - | - | 6 | 2 | 8 | - | - | - | - | - | 8 |
| NEP | - | - | - | - | - | 17 | 17 | - | - | - | - | - | 17 |
| Total | 3 | - | - | 1 | 6 | 19 | 29 | - | - | - | 1 | 1 | 30 |
| **B-series - 11-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| REEF | 4 | 1 | - | 2 | - | - | 7 | - | - | - | - | - | 7 |
| POL | - | - | - | - | 15 | 5 | 20 | - | - | - | - | - | 20 |
| Total | 6 | 1 | - | 2 | 15 | 5 | 29 | - | - | - | - | - | 29 |
| **A-series - 12-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | 1 | - | - | - | - | 1 | - | - | - | 1 | 1 | 2 |
| POL | 1 | - | - | - | 2 | - | 3 | - | - | - | - | - | 3 |
| Total | 2 | 1 | - | - | 2 | - | 5 | - | - | - | 1 | 1 | 6 |

# Appendix table 30.

**Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959**

| Rookery of tagging | Rookery of Recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round 3 - 2-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| **Round 4 - 2-year-old seals, males** | | | | | | | | | | | | | |
| REEF | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| EAST | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 1 | - | - | 1 | 2 | - | 4 | - | - | - | - | - | 4 |
| **Round 5 - 2-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 4 | - | - | - | - | - | 4 | - | - | - | 1 | 1 | 5 |
| REEF | 1 | - | - | - | 1 | - | 2 | - | - | - | 1 | 1 | 3 |
| POL | 2 | 1 | - | - | - | 1 | 4 | - | - | - | - | - | 4 |
| NEP | - | - | - | - | - | 1 | 1 | - | 1 | - | 1 | 2 | 3 |
| STAR | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| ZAP-2 | - | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 |
| Total | 7 | 1 | - | - | 1 | 3 | 12 | - | 1 | 1 | 3 | 5 | 17 |
| **Round 6 - 2-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| TOL | 1 | - | - | 1 | - | 1 | 3 | - | - | - | - | - | 3 |
| L-K | - | - | 1 | - | - | 1 | 2 | - | - | - | - | - | 2 |
| REEF | 2 | - | - | - | 1 | - | 3 | - | - | - | - | - | 3 |
| POL | - | - | - | - | 3 | - | 3 | - | 1 | - | - | 1 | 4 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| ZAP-2 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | 5 | - | 1 | 1 | 4 | 4 | 15 | - | 1 | - | - | 1 | 16 |
| **Round 7 - 2-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 3 | - | 1 | - | - | 1 | 5 | - | - | - | - | - | 5 |
| TOL | 5 | - | - | - | - | - | 5 | - | - | - | - | - | 5 |
| L-K | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| REEF | 3 | - | - | - | - | - | 3 | - | - | - | - | - | 3 |
| POL | 1 | - | - | - | - | 1 | 2 | - | 1 | - | 1 | 2 | 4 |
| NEP | 1 | - | - | - | - | 5 | 6 | - | - | - | - | - | 6 |
| NOR | 1 | - | 1 | - | 2 | - | 4 | 2 | - | - | - | 2 | 6 |
| Total | 14 | - | 2 | - | 2 | 9 | 27 | 2 | 1 | - | 1 | 4 | 31 |
| **Round 8 - 2-year-old seals, males** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NOR | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| ZAP-2 | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 |
| Total | - | - | - | - | 2 | - | 2 | 1 | 1 | - | - | 2 | 4 |
| **Round 9 - 2-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| TOL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| POL | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| NEP | 1 | - | - | - | - | 1 | 2 | - | - | - | 1 | 1 | 3 |
| NOR | - | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 |
| Total | 2 | - | - | - | 1 | 2 | 5 | - | - | 1 | 1 | 2 | 7 |

# Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959

| Rookery of tagging | Rookery of recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round 10 - 2-year-old seals, males** | | | | | | | | | | | | | |
| TOL | 2 | - | - | - | - | 1 | 3 | - | - | - | - | - | 3 |
| L-K | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| REEF | 2 | - | - | - | - | 2 | 4 | - | - | - | - | - | 4 |
| POL | - | - | - | 1 | 11 | - | 12 | - | - | - | - | - | 12 |
| NEP | 2 | - | - | - | - | 5 | 7 | - | - | 1 | - | 1 | 8 |
| NOR | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| EAST | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 7 | - | - | 1 | 11 | 9 | 28 | 1 | - | 1 | - | 2 | 30 |
| **Round 11 - 2-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 1 | 1 | - | - | 1 | 2 | 5 | - | - | - | - | - | 5 |
| L-K | - | - | - | - | 1 | 1 | 2 | - | - | - | - | - | 2 |
| REEF | - | - | - | 1 | 2 | 2 | 5 | - | - | - | - | - | 5 |
| POL | - | 2 | - | - | 5 | 1 | 8 | 1 | - | - | - | 1 | 9 |
| NEP | 1 | - | 1 | - | - | 5 | 7 | - | - | - | - | - | 7 |
| NOR | - | - | - | - | - | 1 | 1 | 1 | - | - | - | 1 | 2 |
| ZAP-2 | - | 2 | - | - | - | 1 | 3 | - | - | - | - | - | 3 |
| Total | 2 | 5 | 1 | 1 | 9 | 13 | 31 | 2 | - | - | - | 2 | 33 |
| **Round 1 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | 3 |
| TOL | 1 | 1 | - | - | - | 1 | 3 | - | - | - | - | - | 3 |
| REEF | 3 | - | - | - | 1 | - | 4 | - | 1 | - | - | 1 | 5 |
| NEP | 3 | - | - | - | 1 | 4 | 8 | - | - | - | - | - | 8 |
| STAR | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| ZAP-2 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | 10 | 1 | - | - | 2 | 7 | 20 | - | 1 | - | - | 1 | 21 |
| **Round 2 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 4 | 2 | - | - | - | - | 6 | - | - | - | - | - | 6 |
| TOL | - | 1 | - | - | 1 | 1 | 3 | - | - | - | - | - | 3 |
| REEF | 7 | 1 | - | - | 1 | - | 9 | - | - | - | 1 | 1 | 10 |
| POL | 2 | - | - | - | - | 1 | 3 | - | - | - | - | - | 3 |
| NEP | 1 | - | - | - | - | 6 | 7 | - | - | - | - | - | 7 |
| NOR | - | - | - | - | 1 | - | 1 | 1 | - | 1 | - | 2 | 3 |
| EAST | - | - | - | - | - | - | - | - | 3 | - | - | 3 | 3 |
| STAR | - | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 |
| ZAP-2 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 15 | 4 | - | - | 3 | 8 | 30 | 1 | 3 | 2 | 1 | 7 | 37 |
| **Round 3 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 7 | 1 | - | - | - | 1 | 9 | - | - | - | - | - | 9 |
| TOL | 8 | - | - | - | 1 | 1 | 10 | - | 1 | - | - | 1 | 11 |
| L-K | 2 | - | 1 | - | - | 1 | 4 | - | - | - | - | - | 4 |
| REEF | 9 | 2 | - | 3 | 1 | 7 | 22 | - | - | - | - | - | 22 |
| POL | 1 | 1 | - | - | 1 | - | 3 | - | - | - | - | - | 3 |
| NEP | 2 | - | - | - | - | 6 | 8 | - | - | - | - | - | 8 |
| NOR | - | - | - | - | 1 | - | 1 | 2 | - | - | - | 2 | 3 |
| EAST | - | - | - | - | - | - | - | - | 4 | - | - | 4 | 4 |
| STAR | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| ZAP-2 | 1 | - | 1 | - | - | 1 | 3 | - | - | - | 1 | 1 | 4 |
| Total | 30 | 4 | 2 | 3 | 5 | 17 | 61 | 2 | 5 | - | 1 | 8 | 69 |

# Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round 4 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 6 | 1 | 3 | - | 1 | - | 11 | - | - | - | 2 | 2 | 13 |
| TOL | 5 | - | 1 | - | - | - | 6 | - | - | - | - | - | 6 |
| L-K | - | - | 1 | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | 11 | 1 | - | 1 | 2 | - | 15 | - | - | - | - | - | 15 |
| POL | 2 | - | - | - | 3 | - | 5 | - | - | - | - | - | 5 |
| NEP | 2 | - | - | - | 3 | - | 5 | - | 1 | - | - | 1 | 6 |
| NOR | 2 | - | - | - | - | - | 2 | 2 | - | - | - | 2 | 4 |
| ZAP-2 | 1 | - | - | - | - | - | 1 | - | - | - | 1 | 1 | 2 |
| Total | 29 | 2 | 5 | 1 | 9 | - | 46 | 2 | 1 | - | 3 | 6 | 52 |
| **Round 5 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 16 | - | - | - | - | - | 16 | - | 1 | - | - | 1 | 17 |
| TOL | 6 | 4 | - | - | 1 | - | 11 | - | - | - | - | - | 11 |
| L-K | - | - | - | - | - | 1 | 1 | 1 | 1 | - | - | 2 | 3 |
| REEF | 9 | 4 | 1 | 2 | - | 2 | 18 | - | 1 | 1 | - | 2 | 20 |
| POL | 1 | 1 | - | - | 7 | 2 | 11 | - | - | - | - | - | 11 |
| NEP | 3 | - | - | - | 4 | 14 | 21 | - | - | - | 1 | 1 | 22 |
| NOR | 4 | - | - | - | - | - | 4 | 3 | 1 | - | - | 4 | 8 |
| EAST | - | - | - | - | - | - | - | 1 | 3 | - | - | 4 | 4 |
| STAR | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| ZAP-2 | 1 | - | - | - | - | - | 1 | 1 | 1 | - | 1 | 3 | 4 |
| Total | 41 | 9 | 1 | 2 | 12 | 19 | 84 | 6 | 8 | 1 | 2 | 17 | 101 |
| **Round 6 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 18 | - | 1 | - | - | - | 19 | - | - | 2 | - | 2 | 21 |
| TOL | 7 | 1 | - | - | 1 | 2 | 11 | 2 | - | - | - | 2 | 13 |
| L-K | 1 | 1 | 2 | - | 3 | 2 | 9 | - | - | - | - | - | 9 |
| REEF | 11 | 1 | - | 1 | 3 | 3 | 19 | - | - | - | - | - | 19 |
| POL | - | - | - | - | 6 | 2 | 8 | - | - | - | - | - | 8 |
| NEP | 2 | 1 | - | - | 8 | 16 | 27 | 1 | 1 | - | - | 2 | 29 |
| NOR | 2 | 1 | - | - | - | - | 3 | 4 | - | - | - | 4 | 7 |
| EAST | 1 | - | - | - | 2 | - | 3 | - | 3 | - | - | 3 | 6 |
| STAR | 2 | - | - | - | 1 | - | 3 | 3 | - | 1 | - | 4 | 7 |
| ZAP-2 | 4 | - | - | - | - | 1 | 5 | - | - | 1 | 4 | 5 | 10 |
| Total | 48 | 5 | 3 | 1 | 24 | 26 | 107 | 10 | 4 | 4 | 4 | 22 | 129 |
| **Round 7 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 5 | 2 | 1 | 1 | 1 | 5 | 15 | - | - | - | - | - | 15 |
| TOL | 7 | 3 | 2 | 1 | 1 | 1 | 15 | - | - | - | - | - | 15 |
| L-K | 1 | 1 | - | - | - | 1 | 3 | 1 | - | - | - | 1 | 4 |
| REEF | 9 | 1 | 3 | 3 | - | 3 | 19 | - | - | - | - | - | 19 |
| POL | 1 | 2 | - | - | 3 | 5 | 11 | - | - | - | 2 | 2 | 13 |
| NEP | 3 | 2 | 1 | - | - | 16 | 22 | - | 1 | - | - | 1 | 23 |
| NOR | 1 | 1 | - | - | - | - | 2 | 2 | - | - | 1 | 3 | 5 |
| EAST | - | - | - | - | 1 | - | 1 | - | 2 | 1 | - | 3 | 4 |
| STAR | - | - | - | - | - | - | - | 1 | 1 | - | - | 2 | 2 |
| ZAP-2 | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 |
| Total | 27 | 12 | 7 | 5 | 6 | 31 | 88 | 4 | 5 | 1 | 3 | 13 | 101 |
| **Round 8 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| TOL | 1 | - | - | - | - | - | 1 | - | - | 1 | - | 1 | 2 |
| REEF | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 3 | - | - | - | - | - | 3 | - | - | 1 | - | 1 | 4 |
| **Round 9 - 3-year-old seals, males** | | | | | | | | | | | | | |
| REEF | - | 1 | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| POL | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| NEP | 1 | - | 1 | - | - | 1 | 3 | - | - | - | - | - | 3 |
| ZAP-2 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 2 | 1 | 1 | - | - | 3 | 7 | - | - | - | - | - | 7 |

# Appendix table 30 (con.)

**Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959**

| Rookery of tagging | Rookery of Recovery: St. Paul Island | | | | | | | St. George Island | | | | | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ZAP-1 | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP-2 | total | |
| **Round 10 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| TOL | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| ZAP-2 | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| Total | - | 1 | - | - | - | 2 | 3 | - | - | - | 1 | 1 | 4 |
| **Round 11 - 3-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| TOL | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| L-K | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | 1 | - | 1 | - | - | 2 | - | - | - | - | - | 2 |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | 1 | - | - | - | 1 | - | 2 | - | - | - | - | - | 2 |
| STAR | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 2 | 4 | - | 1 | 2 | - | 9 | - | - | - | - | - | 9 |
| **Round 1 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 15 | 1 | - | - | 1 | 2 | 19 | - | 1 | - | - | 1 | 20 |
| TOL | 2 | 2 | 1 | - | 2 | 2 | 9 | - | 2 | - | 1 | 3 | 12 |
| L-K | - | - | 2 | 1 | - | 2 | 5 | - | 1 | - | - | 1 | 6 |
| REEF | 14 | 3 | 2 | 8 | 1 | 3 | 31 | 1 | - | - | 2 | 3 | 34 |
| POL | 1 | - | - | - | 6 | 6 | 13 | - | - | - | - | - | 13 |
| NEP | 1 | - | - | - | 2 | 11 | 14 | - | - | - | - | - | 14 |
| Total | 33 | 6 | 5 | 9 | 12 | 26 | 91 | 1 | 4 | - | 3 | 8 | 99 |
| **Round 2 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 12 | 5 | - | - | 1 | 3 | 21 | - | 1 | - | - | 1 | 22 |
| TOL | 5 | 4 | 1 | - | - | - | 10 | 1 | - | - | - | 1 | 11 |
| L-K | 1 | - | 1 | 1 | 1 | - | 4 | - | - | - | - | - | 4 |
| REEF | 12 | 11 | 2 | 3 | 6 | 5 | 39 | - | - | - | 1 | 1 | 40 |
| POL | 1 | 2 | - | - | 11 | 1 | 15 | - | 1 | - | - | 1 | 16 |
| NEP | - | 1 | - | - | 2 | 17 | 20 | - | - | - | - | - | 20 |
| Total | 31 | 23 | 4 | 4 | 21 | 26 | 109 | 1 | 2 | - | 1 | 4 | 113 |
| **Round 3 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 24 | 5 | 2 | - | 1 | 3 | 35 | - | 1 | - | - | 1 | 36 |
| TOL | 8 | 2 | - | - | - | 3 | 13 | - | - | - | - | - | 13 |
| L-K | 1 | - | 4 | - | 2 | 3 | 10 | - | 1 | - | - | 1 | 11 |
| REEF | 12 | 3 | 2 | 9 | 3 | 10 | 39 | 1 | 2 | - | 1 | 4 | 43 |
| POL | 1 | - | 1 | - | 12 | 10 | 24 | 1 | - | - | - | 1 | 25 |
| NEP | 2 | 1 | - | - | 1 | 31 | 35 | - | 1 | - | - | 1 | 36 |
| Total | 48 | 11 | 9 | 9 | 19 | 60 | 156 | 2 | 5 | - | 1 | 8 | 164 |
| **Round 4 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 32 | - | - | - | - | - | 32 | - | - | - | 1 | 1 | 33 |
| TOL | 12 | 2 | - | - | 2 | - | 16 | 1 | 1 | - | - | 2 | 18 |
| L-K | - | - | 3 | - | 1 | - | 4 | - | - | - | - | - | 4 |
| REEF | 20 | 1 | 1 | 8 | 3 | - | 33 | - | 1 | - | - | 1 | 34 |
| POL | - | - | - | - | 20 | - | 20 | - | 1 | 1 | - | 2 | 22 |
| NEP | 4 | - | - | - | - | - | 4 | 1 | 1 | 1 | - | 3 | 7 |
| Total | 68 | 3 | 4 | 8 | 26 | - | 109 | 2 | 4 | 2 | 1 | 9 | 118 |

# Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round 5 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 10 | - | - | - | - | 5 | 15 | - | - | - | - | - | 15 |
| TOL | 8 | 4 | - | - | 1 | 1 | 14 | - | 1 | - | - | 1 | 15 |
| L-K | 1 | - | 1 | - | - | - | 2 | - | - | - | - | - | 2 |
| REEF | 14 | 3 | - | 8 | 1 | 10 | 36 | - | - | - | - | - | 36 |
| POL | 1 | - | - | - | 12 | 3 | 16 | - | - | - | - | - | 16 |
| NEP | - | 1 | - | - | 1 | 14 | 16 | - | - | - | - | - | 16 |
| Total | 34 | 8 | 1 | 8 | 15 | 33 | 99 | - | 1 | - | - | 1 | 100 |
| **Round 6 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 11 | 1 | - | - | 3 | 1 | 16 | - | - | - | - | - | 16 |
| TOL | 12 | 5 | - | - | - | 1 | 18 | - | - | - | - | - | 18 |
| L-K | 2 | - | 3 | - | 1 | 4 | 10 | - | - | - | - | - | 10 |
| REEF | 22 | 5 | 1 | 15 | 4 | 6 | 53 | - | - | - | - | - | 53 |
| POL | 2 | - | 1 | - | 16 | 4 | 23 | - | - | - | - | - | 23 |
| NEP | 3 | - | - | - | - | 19 | 22 | - | - | - | - | - | 22 |
| Total | 52 | 11 | 5 | 15 | 24 | 35 | 142 | - | - | - | - | - | 142 |
| **Round 7 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 1 | 5 | - | - | 2 | 2 | 10 | - | - | - | 1 | 1 | 11 |
| TOL | 2 | 1 | - | - | - | 1 | 4 | - | 1 | - | - | 1 | 5 |
| L-K | 3 | 1 | 4 | - | - | - | 8 | - | - | - | - | - | 8 |
| REEF | 9 | 4 | - | 2 | - | 3 | 18 | - | - | - | 1 | 1 | 19 |
| POL | - | - | - | - | 9 | 4 | 13 | - | - | - | - | - | 13 |
| NEP | - | 1 | - | - | - | 13 | 14 | - | - | - | - | - | 14 |
| Total | 15 | 12 | 4 | 2 | 11 | 23 | 67 | - | 1 | - | 2 | 3 | 70 |
| **Round 8 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | - | 2 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| **Round 10 - 4-year-old seals, males** | | | | | | | | | | | | | |
| L-K | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| REEF | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | - | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 |
| **Round 11 - 4-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| L-K | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| NEP | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | - | 3 | - | - | - | - | 3 | - | - | - | - | - | 3 |
| **Round 1 - 5-year-old seals, males** | | | | | | | | | | | | | |
| REEF | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 |
| **Round 2 - 5-year-old seals, males** | | | | | | | | | | | | | |
| TOL | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |

Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round 3 - 5-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | - | - | - | - | 2 | 1 | 3 | - | - | - | - | - | 3 |
| **Round 4 - 5-year-old seals, males** | | | | | | | | | | | | | |
| REEF | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 5 - 5-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 6 - 5-year-old seals, males** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | 1 | - | - | 1 | - | - | 2 | - | - | - | - | - | 2 |
| Total | 2 | - | - | 1 | - | - | 3 | - | - | - | - | - | 3 |
| **Round 9 - 6-year-old seals, males** | | | | | | | | | | | | | |
| REEF | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| **Round 9 - 7-year-old seals, males** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 11 - 7-year-old seals, males** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 10 - 2-year-old seals, females** | | | | | | | | | | | | | |
| NEP | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| **Round 11 - 2-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 9 - 3-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| TOL | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| REEF | 1 | - | - | 1 | - | - | 2 | - | - | - | - | - | 2 |
| POL | - | - | - | - | 2 | - | 2 | - | - | - | - | - | 2 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| ZAP-2 | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| Total | 2 | 2 | - | 1 | 2 | 1 | 8 | - | - | - | 1 | 1 | 9 |

# Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round 10 - 3-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 3 | 1 | - | - | - | - | 4 | - | - | - | - | - | 4 |
| TOL | 3 | 2 | - | - | - | - | 5 | - | - | - | - | - | 5 |
| REEF | 2 | - | - | 2 | 1 | 1 | 6 | - | 1 | - | 1 | 2 | 8 |
| POL | 1 | - | - | - | 1 | 1 | 3 | - | - | - | - | - | 3 |
| NEP | 2 | - | - | - | 2 | 3 | 7 | - | - | - | - | - | 7 |
| NOR | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| STAR | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| ZAP-2 | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| Total | 12 | 3 | - | 2 | 5 | 5 | 26 | - | 1 | - | 2 | 3 | 30 |
| **Round 11 - 3-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| TOL | 1 | 3 | - | - | 1 | - | 5 | - | - | - | - | - | 5 |
| REEF | - | - | - | 1 | - | 2 | 3 | - | - | - | - | - | 3 |
| POL | - | - | - | - | 6 | 2 | 8 | - | - | - | - | - | 8 |
| NEP | - | 1 | - | - | 2 | 6 | 9 | - | - | 1 | - | 1 | 10 |
| NOR | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| EAST | - | - | - | - | - | - | - | - | 1 | - | - | 1 | 1 |
| STAR | - | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 |
| ZAP-2 | - | - | - | - | 1 | - | 1 | - | - | 1 | - | 1 | 2 |
| Total | 1 | 4 | - | 1 | 11 | 10 | 27 | 1 | 1 | 3 | - | 5 | 32 |
| **Round 5 - 4-year-old seals, females** | | | | | | | | | | | | | |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| **Round 6 - 4-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 7 - 4-year-old seals, females** | | | | | | | | | | | | | |
| L-K | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 8 - 4-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 1 | 2 | - | - | - | - | 3 | - | - | - | - | - | 3 |
| TOL | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| L-K | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | 1 | 2 | - | 1 | 1 | - | 5 | - | - | - | - | - | 5 |
| POL | - | - | - | - | 2 | 1 | 3 | - | - | - | - | - | 3 |
| NEP | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| Total | 5 | 4 | - | 1 | 4 | 1 | 15 | - | - | - | - | - | 15 |
| **Round 9 - 4-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 21 | 5 | - | - | 1 | 2 | 29 | - | - | - | 1 | 1 | 30 |
| TOL | 2 | 2 | - | - | 1 | - | 5 | - | - | - | - | - | 5 |
| L-K | 1 | - | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| REEF | 3 | 1 | - | 1 | - | 6 | 11 | - | - | - | - | - | 11 |
| POL | 2 | - | - | - | 12 | - | 14 | - | - | - | - | - | 14 |
| NEP | 1 | - | - | - | - | 10 | 11 | - | - | - | - | - | 11 |
| Total | 30 | 8 | - | 1 | 14 | 19 | 72 | - | - | - | 1 | 1 | 73 |

## Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island | | | | | | | St. George Island | | | | | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ZAP-1 | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP-2 | total | |
| **Round 10 - 4-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 28 | 1 | - | - | - | - | 29 | - | 1 | - | - | 1 | 30 |
| TOL | 5 | 4 | - | - | 3 | 1 | 13 | - | - | - | - | - | 13 |
| L-K | 2 | - | - | - | 3 | 2 | 7 | - | - | - | - | - | 7 |
| REEF | 7 | 3 | - | 18 | - | 1 | 29 | - | - | - | - | - | 29 |
| POL | 1 | - | - | - | 21 | 2 | 24 | - | - | - | - | - | 24 |
| NEP | 6 | - | - | - | - | 15 | 21 | - | - | - | - | - | 21 |
| Total | 49 | 8 | - | 18 | 27 | 21 | 123 | - | 1 | - | - | 1 | 124 |
| **Round 11 - 4-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 2 | 8 | - | - | - | 2 | 12 | - | - | - | - | - | 12 |
| TOL | - | 11 | - | - | 2 | 1 | 14 | - | - | - | - | - | 14 |
| L-K | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| REEF | 1 | 6 | - | 25 | 2 | 5 | 39 | - | - | - | - | - | 39 |
| POL | - | 1 | - | - | 27 | 5 | 33 | - | - | - | - | - | 33 |
| NEP | - | - | - | - | 1 | 32 | 33 | - | - | - | - | - | 33 |
| Total | 3 | 26 | - | 25 | 32 | 46 | 132 | - | - | - | - | - | 132 |
| **Round 5 - 5-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 6 - 5-year-old seals, females** | | | | | | | | | | | | | |
| TOL | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | - | 1 | - | - | - | 1 | 2 | - | - | - | - | - | 2 |
| **Round 8 - 5-year-old seals, females** | | | | | | | | | | | | | |
| TOL | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| **Round 9 - 5-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 3 | - | - | - | - | - | 3 | - | - | - | - | - | 3 |
| TOL | 4 | - | - | - | - | - | 4 | - | - | - | - | - | 4 |
| L-K | 1 | 3 | - | - | - | - | 4 | - | - | - | - | - | 4 |
| POL | - | - | - | - | 1 | 2 | 3 | - | - | - | - | - | 3 |
| NEP | - | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 |
| Total | 8 | 3 | - | - | 1 | 5 | 17 | - | - | - | - | - | 17 |
| **Round 10 - 5-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| TOL | 3 | 2 | - | - | - | - | 5 | - | - | - | - | - | 5 |
| REEF | 2 | - | - | 2 | - | 1 | 5 | - | - | - | - | - | 5 |
| POL | - | - | - | - | 3 | - | 3 | - | - | - | - | - | 3 |
| NEP | - | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 |
| Total | 7 | 2 | - | 2 | 3 | 4 | 18 | - | - | - | - | - | 18 |
| **Round 11 - 5-year-old seals, females** | | | | | | | | | | | | | |
| L-K | - | 2 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| REEF | 1 | - | - | 3 | 2 | 1 | 7 | - | - | - | - | - | 7 |
| POL | - | - | - | - | 2 | 1 | 3 | - | - | - | - | - | 3 |
| NEP | - | 2 | - | - | 1 | 4 | 7 | - | - | - | - | - | 7 |
| Total | 1 | 4 | - | 3 | 5 | 6 | 19 | - | - | - | - | - | 19 |

# Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island ZAP-1 | TOL | L-K | REEF | POL | NEP | total | St. George Island NOR | EAST | STAR | ZAP-2 | total | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Round 8 - 6-year-old seals, females** | | | | | | | | | | | | | |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| **Round 9 - 6-year-old seals, females** | | | | | | | | | | | | | |
| TOL | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| REEF | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| Total | 1 | 2 | - | - | - | 2 | 5 | - | - | - | - | - | 5 |
| **Round 10 - 6-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| TOL | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| L-K | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| REEF | - | - | - | 2 | - | 1 | 3 | - | - | - | - | - | 3 |
| POL | - | - | - | - | 4 | - | 4 | - | - | - | - | - | 4 |
| NEP | - | - | - | - | - | 3 | 3 | - | - | - | - | - | 3 |
| Total | 3 | 1 | - | 2 | 4 | 5 | 15 | - | - | - | - | - | 15 |
| **Round 11 - 6-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |
| TOL | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | 2 | - | 1 | - | - | 3 | - | - | - | - | - | 3 |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 2 | 2 | - | - | - | 1 | 1 | 3 |
| Total | 1 | 4 | - | 1 | 1 | 2 | 9 | - | - | - | 1 | 1 | 10 |
| **Round 8 - 7-year-old seals, females** | | | | | | | | | | | | | |
| REEF | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| POL | - | - | - | - | 2 | 1 | 3 | - | - | - | - | - | 3 |
| NEP | - | - | - | - | - | 2 | 2 | - | - | - | - | - | 2 |
| Total | - | - | - | 1 | 2 | 3 | 6 | - | - | - | - | - | 6 |
| **Round 9 - 7-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | 3 | - | - | 3 | - | - | 6 | - | - | - | - | - | 6 |
| POL | - | - | - | - | 3 | 7 | 10 | - | - | - | - | - | 10 |
| NEP | - | - | - | - | - | 6 | 6 | - | - | - | - | - | 6 |
| Total | 4 | - | - | 3 | 3 | 13 | 23 | - | - | - | - | - | 23 |
| **Round 10 - 7-year-old seals, females** | | | | | | | | | | | | | |
| REEF | 3 | 2 | - | 1 | 1 | 1 | 8 | - | - | - | - | - | 8 |
| POL | - | - | - | - | 22 | 8 | 30 | - | - | - | - | - | 30 |
| NEP | - | - | - | - | - | 14 | 14 | - | - | - | - | - | 14 |
| Total | 3 | 2 | - | 1 | 23 | 23 | 52 | - | - | - | - | - | 52 |
| **Round 11 - 7-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| POL | - | 1 | - | - | 14 | 4 | 19 | - | - | - | - | - | 19 |
| NEP | - | - | - | - | - | 6 | 6 | - | - | - | - | - | 6 |
| Total | - | 3 | - | - | 14 | 10 | 27 | - | - | - | - | - | 27 |
| **Round 8 - 8-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| **Round 10 - 8-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 2 | 1 | 3 | - | - | - | - | - | 3 |

## Appendix table 30 (con.)

Recovery location of tagged seals in commercial kill, by round, Pribilof Islands, 1959

| Rookery of tagging | Rookery of Recovery: St. Paul Island | | | | | | | St. George Island | | | | | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ZAP-1 | TOL | L-K | REEF | POL | NEP | total | NOR | EAST | STAR | ZAP-2 | total | |
| **Round 11 - 8-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 2 | - | 2 | - | - | - | - | - | 2 |
| **Round 6 - 10-year-old seals, females** | | | | | | | | | | | | | |
| REEF | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| **Round 8 - 10-year-old seals, females** | | | | | | | | | | | | | |
| REEF | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | - | - | - | 1 | - | 1 | 2 | - | - | - | - | - | 2 |
| **Round 9 - 10-year-old seals, females** | | | | | | | | | | | | | |
| REEF | 1 | - | - | - | - | - | 1 | - | - | - | 1 | 1 | 2 |
| NEP | - | - | - | - | - | 4 | 4 | - | - | - | - | - | 4 |
| Total | 1 | - | - | - | - | 4 | 5 | - | - | - | 1 | 1 | 6 |
| **Round 10 - 10-year-old seals, females** | | | | | | | | | | | | | |
| REEF | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| POL | - | - | - | - | 5 | 2 | 7 | - | - | - | - | - | 7 |
| NEP | - | - | - | - | - | 11 | 11 | - | - | - | - | - | 11 |
| Total | 1 | - | - | - | 5 | 13 | 19 | - | - | - | - | - | 19 |
| **Round 11 - 10-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 |
| NEP | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| Total | - | - | - | - | 1 | 1 | 2 | - | - | - | - | - | 2 |
| **Round 8 - 11-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | - | 1 | 1 | - | - | - | - | - | 1 |
| **Round 9 - 11-year-old seals, females** | | | | | | | | | | | | | |
| POL | - | - | - | - | 4 | 1 | 5 | - | - | - | - | - | 5 |
| **Round 10 - 11-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| REEF | 3 | - | - | 1 | - | - | 4 | - | - | - | - | - | 4 |
| POL | - | - | - | - | 7 | 1 | 8 | - | - | - | - | - | 8 |
| Total | 5 | - | - | 1 | 7 | 1 | 14 | - | - | - | - | - | 14 |
| **Round 11 - 11-year-old seals, females** | | | | | | | | | | | | | |
| REEF | 1 | 1 | - | 1 | - | - | 3 | - | - | - | - | - | 3 |
| POL | - | - | - | - | 4 | 2 | 6 | - | - | - | - | - | 6 |
| Total | 1 | 1 | - | 1 | 4 | 2 | 9 | - | - | - | - | - | 9 |
| **Round 10 - 12-year-old seals, females** | | | | | | | | | | | | | |
| ZAP-1 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| REEF | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| POL | - | - | - | - | 2 | - | 2 | - | - | - | - | - | 2 |
| Total | 1 | - | - | - | 2 | - | 3 | - | - | - | 1 | 1 | 4 |
| **Round 11 - 12-year-old seals, females** | | | | | | | | | | | | | |
| REEF | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| POL | 1 | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | 1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 |

Appendix table 31.
Length of tagged 3-year-old male seals by date of recovery, Pribilof Islands, 1959

| Date | Length in inches | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | |
| 27 June | - | - | 1 | 2 | - | 2 | 3 | 1 | - | - | 9 |
| 28 | - | 1 | - | - | - | - | - | - | - | - | 1 |
| 29 | - | - | 1 | 5 | 6 | 1 | - | - | - | - | 13 |
| 1 July | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| Total | - | 1 | 2 | 7 | 7 | 4 | 3 | 1 | - | - | 25 |
| 2 July | 1 | 2 | 3 | 5 | 1 | 1 | - | - | - | - | 13 |
| 3 | - | - | - | 4 | 1 | 1 | - | - | 1 | - | 7 |
| 4 | 1 | 2 | 8 | 2 | 5 | 1 | - | 1 | - | - | 20 |
| 5 | - | - | - | 3 | - | - | - | - | - | - | 3 |
| 6 | - | - | 2 | 1 | 1 | - | - | - | - | - | 4 |
| Total | 2 | 4 | 13 | 15 | 8 | 3 | - | 1 | 1 | - | 47 |
| 7 July | - | - | 2 | 1 | 2 | 2 | 2 | - | - | - | 9 |
| 8 | - | - | 3 | 3 | 1 | - | - | - | - | - | 7 |
| 9 | - | 3 | 8 | 12 | 13 | 2 | 2 | - | - | - | 40 |
| 10 | - | - | - | 2 | - | - | - | - | 1 | - | 3 |
| 11 | - | 2 | 2 | 1 | - | 1 | - | - | 1 | - | 7 |
| Total | - | 5 | 15 | 19 | 16 | 5 | 4 | - | 2 | - | 66 |
| 12 July | - | - | 1 | 3 | 7 | 1 | 1 | 3 | - | - | 16 |
| 13 | - | - | - | 4 | 3 | 1 | 1 | - | - | - | 9 |
| 14 | - | - | 14 | 9 | 8 | 2 | - | - | - | - | 33 |
| 15 | - | - | - | - | - | - | - | 1 | - | - | 1 |
| 16 | - | - | 5 | 2 | 2 | 2 | - | - | - | - | 11 |
| Total | - | - | 20 | 18 | 20 | 6 | 2 | 4 | - | - | 70 |
| 17 July | - | - | 1 | 7 | 5 | 8 | 2 | - | - | - | 23 |
| 18 | - | - | 9 | 6 | - | - | - | - | - | - | 15 |
| 19 | - | 1 | 7 | 13 | 19 | 8 | 7 | 1 | 1 | - | 57 |
| 20 | - | - | 3 | 2 | - | - | - | - | - | - | 5 |
| 21 | - | - | 4 | 6 | 6 | 1 | 3 | - | - | - | 20 |
| Total | - | 1 | 24 | 34 | 30 | 17 | 12 | 1 | 1 | - | 120 |

Appendix table 31. (con.)
Length of tagged 3-year-old male seals by date of recovery, Pribilof Islands, 1959

| Date | Length in inches | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | |
| 22 July | - | - | 14 | 8 | 5 | 3 | 1 | - | - | - | 31 |
| 23 | - | - | 1 | 3 | 5 | 3 | 1 | - | - | - | 13 |
| 24 | - | 2 | 21 | 18 | 12 | 6 | 1 | - | - | - | 60 |
| 25 | - | - | 1 | 3 | - | 2 | - | - | - | - | 6 |
| 26 | - | 2 | 9 | 10 | 7 | 2 | 1 | - | 1 | - | 32 |
| Total | - | 4 | 46 | 42 | 29 | 16 | 4 | - | 1 | - | 142 |
| 27 July | - | - | 4 | 4 | 9 | 10 | 6 | 1 | 1 | 1 | 36 |
| 28 | - | - | 6 | 5 | 6 | 5 | 4 | - | - | - | 26 |
| 29 | - | - | 3 | 8 | 11 | 10 | 6 | 1 | - | - | 39 |
| 30 | - | - | 2 | 3 | 1 | - | - | - | - | - | 6 |
| 31 | - | - | - | 3 | 2 | 2 | - | 1 | - | - | 8 |
| Total | - | - | 15 | 23 | 29 | 27 | 16 | 3 | 1 | 1 | 115 |
| 3 August | - | - | - | 2 | 1 | - | - | 1 | - | - | 4 |
| 4 | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Total | - | - | - | 2 | 2 | - | - | 1 | - | - | 5 |
| 6 August | - | - | 1 | 1 | - | 1 | 1 | - | - | - | 4 |
| 7 | - | - | 1 | - | 1 | - | - | - | - | - | 2 |
| 8 | - | - | 1 | - | 1 | 1 | - | - | - | - | 3 |
| Total | - | - | 3 | 1 | 2 | 2 | 1 | - | - | - | 9 |
| 11 August | - | - | 1 | - | 3 | - | - | - | - | - | 4 |
| 12 | - | - | - | - | 1 | 1 | - | - | - | - | 2 |
| 13 | - | - | 1 | - | 1 | - | - | - | - | - | 2 |
| Total | - | - | 2 | - | 5 | 1 | - | - | - | - | 8 |
| 17 August | - | - | - | 1 | 2 | 1 | - | - | - | - | 4 |
| 18 | - | - | - | - | 1 | - | 1 | - | - | - | 2 |
| 19 | - | I | - | - | 1 | - | - | - | - | - | 2 |
| 20 | - | - | 2 | - | - | - | - | - | - | - | 2 |
| Total | - | 1 | 2 | 1 | 4 | 1 | 1 | - | - | - | 10 |
| Total | 2 | 16 | 142 | 162 | 152 | 82 | 43 | 11 | 6 | 1 | 617 |

Appendix table 32.
Length of tagged 4-year-old male seals by date of recovery, Pribilof Islands, 1959

| Date | Length in inches | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | |
| 27 June | - | 1 | - | 2 | 1 | 10 | 9 | 4 | 2 | - | 1 | - | 30 |
| 28 | - | - | 1 | 1 | 2 | 6 | - | 3 | 1 | - | - | - | 14 |
| 29 | - | - | - | 4 | 5 | 14 | 10 | 6 | 2 | 2 | - | - | 43 |
| 30 | - | - | - | 1 | 2 | 4 | 1 | 5 | - | - | - | - | 13 |
| 1 July | - | - | - | - | 5 | 5 | 6 | 1 | 2 | - | - | - | 19 |
| Total | - | 1 | 1 | 8 | 15 | 39 | 26 | 19 | 7 | 2 | 1 | - | 119 |
| 2 July | -- | -- | 1 | 3 | 8 | 11 | 7 | - | - | 1 | - | - | 31 |
| 3 | - | - | - | 1 | 4 | 7 | 10 | 5 | 1 | 1 | 1 | - | 30 |
| 4 | 1 | - | 3 | 5 | 8 | 9 | 3 | 5 | - | 1 | - | - | 35 |
| 5 | - | - | - | 1 | 1 | - | - | 2 | 1 | - | - | - | 5 |
| 6 | - | 2 | 4 | 6 | 5 | 5 | 1 | 2 | - | - | - | - | 25 |
| Total | 1 | 2 | 8 | 16 | 26 | 32 | 21 | 14 | 2 | 3 | 1 | - | 126 |
| 7 July | - | 1 | 1 | 2 | 3 | 6 | 7 | 10 | - | - | - | - | 30 |
| 8 | - | 2 | - | 4 | 5 | 5 | 2 | 3 | - | - | - | - | 21 |
| 9 | - | - | 2 | 14 | 13 | 14 | 11 | 5 | 2 | 2 | - | - | 63 |
| 10 | - | - | - | 1 | 3 | 1 | - | 3 | - | 1 | - | 1 | 10 |
| 11 | - | 3 | 4 | 3 | 4 | 2 | 4 | 3 | 1 | - | - | - | 24 |
| Total | - | 6 | 7 | 24 | 28 | 28 | 24 | 24 | 3 | 3 | - | 1 | 148 |
| 12 July | - | - | - | 5 | 8 | 3 | 10 | 5 | 4 | 1 | 1 | - | 37 |
| 13 | - | - | 1 | - | 2 | 3 | 5 | 1 | 1 | - | - | - | 13 |
| 14 | - | 1 | 5 | 24 | 21 | 18 | 7 | 2 | 2 | - | - | - | 80 |
| 15 | - | - | - | - | 3 | 3 | 2 | 2 | 1 | - | - | - | 11 |
| 16 | - | 1 | 4 | 4 | 8 | 3 | 6 | 1 | - | - | - | - | 27 |
| Total | - | 2 | 10 | 33 | 42 | 30 | 30 | 11 | 8 | 1 | 1 | - | 168 |
| 17 July | - | 1 | 1 | - | 12 | 6 | 9 | 11 | 3 | 1 | - | - | 44 |
| 18 | - | - | 3 | 2 | 2 | 1 | 1 | - | 1 | - | - | - | 10 |
| 19 | - | - | - | 5 | 6 | 5 | 11 | 6 | 4 | - | - | - | 37 |
| 20 | - | - | 3 | - | 2 | 6 | 1 | - | - | - | - | - | 12 |
| 21 | - | - | - | - | 2 | 6 | 5 | 4 | 1 | - | - | - | 18 |
| Total | - | 1 | 7 | 7 | 24 | 24 | 27 | 21 | 9 | 1 | - | - | 121 |

Appendix table 32 (con.)
Length of tagged 4-year-old male seals by date of recovery, Pribilof Islands, 1959

| Date | Length in inches | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | |
| 22 July | 1 | 3 | 7 | 7 | 15 | 5 | 1 | 1 | - | - | - | - | 40 |
| 23 | - | - | 3 | 2 | 1 | 5 | 2 | 4 | 1 | 1 | - | - | 19 |
| 24 | - | 1 | 3 | 10 | 18 | 7 | 12 | 5 | 1 | 1 | - | - | 58 |
| 25 | - | - | - | 2 | 1 | 3 | 5 | 2 | 2 | 1 | - | - | 16 |
| 26 | - | - | 1 | 3 | 10 | 7 | 2 | 2 | - | - | - | - | 25 |
| Total | 1 | 4 | 14 | 24 | 45 | 27 | 22 | 14 | 4 | 3 | - | - | 158 |
| 27 July | - | - | 2 | - | 7 | 10 | 4 | 3 | 2 | 3 | - | - | 31 |
| 28 | - | - | 4 | 4 | 5 | 3 | 1 | - | - | - | - | - | 17 |
| 29 | - | - | - | - | 2 | 5 | 6 | 1 | 1 | 2 | - | - | 17 |
| 30 | - | - | - | 1 | - | - | 1 | - | - | - | - | - | 2 |
| 31 | - | - | - | - | 3 | - | 2 | 6 | - | 2 | - | - | 13 |
| Total | - | - | 6 | 5 | 17 | 18 | 14 | 10 | 3 | 7 | - | - | 80 |
| 2 August | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| Total | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 11 August | - | - | - | 1 | - | 1 | - | 1 | - | - | - | - | 3 |
| Total | - | - | - | 1 | - | 1 | - | 1 | - | - | - | - | 3 |
| 17 August | - | 1 | - | - | 1 | - | 1 | - | - | - | - | - | 3 |
| Total | - | 1 | - | - | 1 | - | 1 | - | - | - | - | - | 3 |
| Total | 2 | 17 | 53 | 118 | 198 | 199 | 167 | 114 | 36 | 20 | 3 | 1 | 928 |

Appendix table 33.
Length of tagged 3-year-old female seals by date of recovery, Pribilof Islands, 1959

| Date | Length in inches | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | |
| 4 August | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 5 | - | - | 1 | - | - | - | - | - | - | - | - | 1 |
| Total | - | - | 1 | 1 | - | - | - | - | - | - | - | 2 |
| 6 August | - | - | 1 | - | 1 | - | - | - | - | - | - | 2 |
| 7 | - | - | - | 1 | 1 | - | - | - | - | - | - | 2 |
| 8 | - | - | - | 2 | 1 | 1 | - | - | - | - | - | 4 |
| 9 | - | - | 1 | - | - | - | - | - | - | - | - | 1 |
| 10 | - | - | - | 1 | - | - | 1 | - | - | - | - | 2 |
| Total | - | - | 2 | 4 | 3 | 1 | 1 | - | - | - | - | 11 |
| 11 August | - | 1 | 2 | 4 | 1 | - | - | - | - | - | - | 8 |
| 12 | - | - | 1 | 2 | - | - | - | - | - | - | - | 3 |
| 13 | - | - | 1 | 9 | 4 | 1 | 1 | - | - | - | - | 16 |
| 14 | - | - | - | 1 | 1 | - | 1 | - | - | - | - | 3 |
| 15 | - | - | 2 | 1 | 1 | 2 | - | 1 | - | - | - | 7 |
| Total | - | 1 | 6 | 17 | 7 | 3 | 2 | 1 | - | - | - | 37 |
| 16 August | - | - | 1 | 4 | 4 | 1 | 1 | - | - | - | - | 11 |
| 17 | 1 | - | 1 | 1 | 2 | - | - | - | - | - | - | 5 |
| 18 | - | - | - | - | 1 | 1 | - | - | - | - | - | 2 |
| 19 | - | - | 2 | 1 | 4 | - | - | - | - | - | - | 7 |
| 20 | - | - | 1 | 7 | 5 | 3 | - | - | - | - | - | 16 |
| Total | 1 | - | 5 | 13 | 16 | 5 | 1 | - | - | - | - | 41 |
| Total | 1 | 1 | 14 | 35 | 26 | 9 | 4 | 1 | - | - | - | 91 |

Appendix table 34.
Length of tagged 4-year-old female seals by date of recovery, Pribilof Islands, 1959

| Date | Length in inches | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | |
| 17 July | - | - | - | - | - | - | - | 1 | - | 1 |
| Total | - | - | - | - | - | - | - | 1 | - | 1 |
| 26 July | - | - | 1 | - | - | - | - | - | - | 1 |
| Total | - | - | 1 | - | - | - | - | - | - | 1 |
| 29 July | - | - | - | - | 1 | - | - | - | - | 1 |
| 31 | - | - | - | - | - | 1 | - | - | - | 1 |
| Total | - | - | - | - | 1 | 1 | - | - | - | 2 |
| 1 August | - | - | 1 | - | - | - | - | - | - | 1 |
| 2 | - | - | 1 | - | - | 3 | - | - | - | 4 |
| 3 | - | - | 1 | 7 | - | - | - | - | 1 | 9 |
| 4 | - | - | 1 | 1 | - | - | - | - | - | 2 |
| 5 | - | - | 4 | - | - | - | - | - | - | 4 |
| Total | - | - | 8 | 8 | - | 3 | - | - | 1 | 20 |
| 6 August | - | - | 1 | 2 | 10 | 4 | 6 | - | - | 23 |
| 7 | - | - | 2 | 4 | 2 | - | - | - | - | 8 |
| 8 | - | - | 3 | 3 | 12 | 11 | 4 | 2 | 2 | 37 |
| 9 | - | - | - | - | 1 | - | - | - | - | 1 |
| 10 | - | 1 | 1 | 4 | 5 | 1 | 2 | 1 | - | 15 |
| Total | - | 1 | 7 | 13 | 30 | 16 | 12 | 3 | 2 | 84 |
| 11 August | - | 1 | 4 | 5 | 7 | 4 | 2 | 1 | - | 24 |
| 12 | - | - | 1 | 1 | 2 | 2 | 2 | 1 | - | 9 |
| 13 | - | 1 | 16 | 20 | 14 | 6 | 4 | - | - | 61 |
| 14 | - | - | 1 | 5 | 4 | 6 | 4 | 1 | - | 21 |
| 15 | 1 | 1 | 4 | 12 | 4 | 5 | 3 | 2 | - | 32 |
| Total | 1 | 3 | 26 | 43 | 31 | 23 | 15 | 5 | - | 147 |
| 16 August | - | - | 2 | 13 | 11 | 15 | 5 | 2 | 1 | 49 |
| 17 | 1 | - | 7 | 7 | 8 | 5 | 1 | - | - | 29 |
| 18 | - | - | 1 | 2 | 4 | 2 | 1 | - | - | 10 |
| 19 | - | 4 | 5 | 9 | 4 | 2 | 2 | 1 | - | 27 |
| 20 | - | - | 2 | 13 | 11 | 6 | 4 | 1 | - | 37 |
| Total | 1 | 4 | 17 | 44 | 38 | 30 | 13 | 4 | 1 | 152 |
| Total | 2 | 8 | 59 | 108 | 100 | 73 | 40 | 13 | 4 | 407 |

Appendix table 35.
Reproductive condition of female seals sampled from commercial kill, by rookery of recovery, Pribilof Islands, 1959

St. Paul Island

| | ZAP | TOL | L-K | REEF | POL | NEP | Total |
|---|---|---|---|---|---|---|---|
| Pregnant | | | | | | | |
| number | 348 | 244 | 13 | 192 | 331 | 424 | 1,552 |
| percent | 22 | 16 | 1 | 13 | 21 | 27 | 39 |
| Nonpregnant | | | | | | | |
| number | 604 | 374 | 3 | 319 | 481 | 651 | 2,432 |
| percent | 25 | 15 | - | 13 | 20 | 27 | 61 |
| Total | 952 | 618 | 16 | 511 | 812 | 1,075 | 3,984 |
| Percent | 24 | 16 | - | 13 | 20 | 27 | |

St. George Island

| | ZAP | NOR | EAS | STAR | Total |
|---|---|---|---|---|---|
| Pregnant | | | | | |
| number | 140 | 193 | 120 | 141 | 594 |
| percent | 24 | 32 | 20 | 24 | 50 |
| Nonpregnant | | | | | |
| number | 138 | 183 | 126 | 141 | 588 |
| percent | 24 | 31 | 21 | 24 | 50 |
| Total | 278 | 376 | 246 | 282 | 1,182 |
| Percent | 24 | 32 | 21 | 23 | |

Appendix table 36.
Vibrissal color of female seals sampled from commercial kill, by age, Pribilof Islands, 1959

| Vibrissal color | Age 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10+ | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **St. Paul Island** | | | | | | | | | | | |
| Black | | | | | | | | | | | |
| number | 30 | 236 | 462 | 71 | 11 | 2 | - | - | - | 1 | 813 |
| percent | 4 | 29 | 57 | 9 | 1 | - | - | - | - | - | 20 |
| Black and white | | | | | | | | | | | |
| number | - | 17 | 495 | 362 | 179 | 98 | 35 | 9 | 6 | 11 | 1212 |
| percent | - | 1 | 41 | 30 | 15 | 8 | 3 | 1 | - | 1 | 31 |
| White | | | | | | | | | | | |
| number | - | 4 | 21 | 118 | 239 | 367 | 218 | 162 | 146 | 684 | 1959 |
| percent | - | - | 1 | 6 | 12 | 19 | 11 | 8 | 8 | 35 | 49 |
| Total | 30 | 257 | 978 | 551 | 429 | 467 | 253 | 171 | 152 | 696 | 3984 |
| Percent | 1 | 6 | 25 | 14 | 11 | 12 | 6 | 4 | 4 | 17 | |
| **St. George Island** | | | | | | | | | | | |
| Black | | | | | | | | | | | |
| number | 1 | 59 | 140 | 24 | 5 | 3 | - | - | - | - | 232 |
| percent | - | 26 | 61 | 10 | 2 | 1 | - | - | - | - | 20 |
| Black and white | | | | | | | | | | | |
| number | - | 7 | 84 | 62 | 17 | 8 | 1 | - | - | 3 | 182 |
| percent | - | 4 | 46 | 34 | 9 | 4 | 1 | - | - | 2 | 15 |
| White | | | | | | | | | | | |
| number | - | 1 | 17 | 74 | 103 | 137 | 83 | 75 | 60 | 218 | 768 |
| percent | - | - | 2 | 10 | 13 | 18 | 11 | 10 | 8 | 28 | 65 |
| Total | 1 | 67 | 241 | 160 | 125 | 148 | 84 | 75 | 60 | 221 | 1182 |
| Percent | - | 6 | 20 | 14 | 11 | 12 | 7 | 6 | 5 | 19 | |

Appendix table 37.
Vibrissal color of female seals sampled from commercial kill, by reproductive condition, Pribilof Islands, 1959

| | | Primipara | | Multipara | | |
|---|---|---|---|---|---|---|
| | Nullipara | pregnant | non-pregnant | pregnant | non-pregnant | Total |
| | | | St. Paul Island | | | |
| Black | | | | | | |
| number | 707 | 93 | 8 | 3 | 2 | 813 |
| percent | 87 | 12 | 1 | - | - | 20 |
| Black and white | | | | | | |
| number | 614 | 410 | 34 | 82 | 72 | 1212 |
| percent | 50 | 34 | 3 | 7 | 6 | 31 |
| White | 109 | 233 | 62 | 731 | 824 | 1959 |
| percent | 6 | 12 | 3 | 37 | 42 | 49 |
| Total | 1,430 | 736 | 104 | 816 | 898 | 3,984 |
| Percent | 36 | 18 | 3 | 21 | 22 | |
| | | | St. George Island | | | |
| Black | | | | | | |
| number | 192 | 35 | 3 | 2 | - | 232 |
| percent | 83 | 15 | 1 | 1 | - | 20 |
| Black and white | | | | | | |
| number | 89 | 68 | 9 | 13 | 3 | 182 |
| percent | 49 | 37 | 5 | 7 | 2 | 15 |
| White | | | | | | |
| number | 37 | 76 | 25 | 400 | 230 | 768 |
| percent | 5 | 10 | 3 | 52 | 30 | 65 |
| Total | 318 | 179 | 37 | 415 | 233 | 1,182 |
| Percent | 27 | 15 | 3 | 35 | 20 | |

Appendix table 38.

Bull counts, Pribilof Islands, 1911-1959

| Year | St. Paul Island | | St. George Island | | Both islands | |
|---|---|---|---|---|---|---|
| | harem | idle | harem | idle | harem | idle |
| 1911 | 1,090 | 258 | 266 | 71 | 1,356 | 329 |
| 1912 | 1,077 | 93 | 281 | 20 | 1,358 | 113 |
| 1913 | 1,142 | 77 | 261 | 28 | 1,403 | 105 |
| 1914 | 1,316 | 159 | 243 | 13 | 1,559 | 172 |
| 1915 | 1,789 | 546 | 362 | 127 | 2,151 | 673 |
| 1916 | 2,948 | 2,278 | 552 | 354 | 3,500 | 2,632 |
| 1917 | 4,166 | 2,341 | 684 | 365 | 4,850 | 2,706 |
| 1918 | 4,610 | 2,245 | 734 | 199 | 5,344 | 2,444 |
| 1919 | 4,573 | 2,158 | 585 | 81 | 5,158 | 2,239 |
| 1920 | 3,542 | 1,078 | 524 | 83 | 4,066 | 1,161 |
| 1921 | 3,443 | 711 | 466 | 36 | 3,909 | 747 |
| 1922 | 3,184 | 493 | 378 | 15 | 3,562 | 508 |
| 1923 | 3,051 | 303 | 361 | 9 | 3,412 | 312 |
| 1924 | 3,127 | 375 | 389 | 15 | 3,516 | 390 |
| 1925 | 3,103 | 283 | 423 | 28 | 3,526 | 311 |
| 1926 | 3,478 | 368 | 556 | 55 | 4,034 | 423 |
| 1927 | 3,916 | 846 | 727 | 126 | 4,643 | 972 |
| 1928 | 5,059 | 1,208 | 991 | 241 | 6,050 | 1,449 |
| 1929 | 5,998 | 1,339 | 1,189 | 294 | 7,187 | 1,633 |
| 1930 | 6,823 | 1,555 | 1,489 | 344 | 8,312 | 1,899 |
| 1931 | 7,557 | 1,519 | 1,676 | 369 | 9,233 | 1,888 |
| 1932 | 8,268 | 1,940 | 1,820 | 409 | 10,088 | 2,349 |
| 1933 | 8,334 | 1,933 | 1,879 | 408 | 10,213 | 2,341 |
| 1934 | 8,841 | 1,860 | 1,929 | 422 | 10,770 | 2,282 |
| 1935 | 9,444 | 2,082 | 2,103 | 453 | 11,537 | 2,535 |
| 1936 | 10,055 | 2,253 | - | - | - | - |
| 1937 | 10,689 | 2,516 | 2,411 | 515 | 13,100 | 3,031 |
| 1938 | 10,720 | 1,787 | - | - | - | - |
| 1939 | 9,122 | 2,616 | 1,858 | 357 | 10,980 | 2,973 |
| 1940 | 9,662 | 3,968 | 1,988 | 571 | 11,650 | 4,539 |
| 1941 | 10,089 | 5,059 | 1,942 | 396 | 12,031 | 5,455 |
| 1942 | - | - | - | - | - | - |
| 1943 | 10,948 | 3,523 | 2,107 | 330 | 13,055 | 3,853 |
| 1944 | 11,080 | 2,539 | 2,294 | 450 | 13,374 | 2,989 |
| 1945 | 10,750 | 4,055 | 2,434 | 750 | 13,184 | 4,805 |
| 1946 | 10,566 | 3,605 | 2,430 | 611 | 12,996 | 4,216 |
| 1947 | 10,160 | 3,331 | 1,808 | 479 | 11,968 | 3,810 |
| 1948 | 10,386 | 3,400 | 1,814 | 563 | 12,200 | 3,963 |
| 1949 | 9,304 | 2,861 | 1,745 | 552 | 11,049 | 3,413 |
| 1950 | 9,442 | 3,152 | 1,959 | 574 | 11,401 | 3,726 |
| 1951 | 9,434 | 3,581 | 1,825 | 549 | 11,259 | 4,130 |
| 1952 | 9,318 | 4,717 | 1,983 | 605 | 11,301 | 5,322 |
| 1953 | 9,848 | 5,912 | 2,285 | 826 | 12,133 | 6,738 |
| 1954 | 9,906 | 6,847 | 2,228 | 1,311 | 12,134 | 8,158 |
| 1955 | 9,034 | 8,650 | 2,130 | 1,902 | 11,164 | 10,552 |
| 1956 | 9,384 | 9,016 | - | - | - | - |
| 1957 | 9,562 | 10,060 | 2,423 | 2,693 | 11,985 | 12,753 |
| 1958 | 9,970 | 9,510 | 2,619 | 3,030 | 12,589 | 12,540 |
| 1959 | 10,003 | 11,485 | 2,527 | 2,699 | 12,530 | 14,184 |

# Appendix table 39.

Record of fur seal pups tagged on Pribilof Islands

| Year | Series | Kind of metal | Number tagged on St. Paul | Number tagged on St. George | Marks |
|---|---|---|---|---|---|
| 1941 | 1-5000 | Monel | 5000 | - | Branded-nape of neck |
| " | 5001-10000 | Stainless | 5000 | - | Branded-nape of neck |
| 1945 | 10001-11000 | Monel | 973 | - | No check mark |
| 1947 | A 1-20000 | Monel | 19183 | - | 1/4" hole between 1st and 2nd digits left hind flipper |
| 1948 | B 1-20000 | Monel | 19532 | - | No check mark |
| 1949 | CS 1-20000 | Monel | 19960 | - | No check mark |
| 1951 | D 1-1000 | Monel | 1000 | - | 1/2 left ear on 100 tagged pups removed |
| 1952 | E 1-20000 | Monel | 19979 | - | Tip of digit on right hind flipper sliced off |
| 1953 | F 1-10000 | Monel | 9990 | - | Tip of left front flipper sliced off |
| " | G 7001-7400 | Monel | 398 | - | Tip of left front flipper sliced off |
| 1954 | G 1-7000 | Monel | 7000 | - | "V" notch on right front flipper, leading |
| " | G 7401-10400 | Monel | 3000 | - | edge near tip |
| 1955 | H 1-10000 | Monel | | - | Tip of digit on left hind flipper sliced |
| " | 10001-50000 (without prefix H) | Monel | 49870 | - | off |
| 1956 | I 1-10000 | Monel | - | 9894 | Tip of right front flipper sliced off |
| " | I 10001-50000 | Monel | 39900 | - | Tip of right front flipper sliced off |
| 1957 | J 1-10000 | Monel | - | 9972 | "V" notch leading edge left front |
| " | J 10001-50000 | Monel | 39870 | - | flipper near tip |
| 1958 | K 1-10000 | Monel | - | 9994 | "V" notch leading edge right front |
| " | K 10001-50000 | Monel | 39923 | - | flipper near tip. |
| " | K 10001-15000 | Monel | 5000 | - | Duplicate tags on left front flipper |
| 1959 | L 1-10000 | Monel | | 9980 | Tip of left front flipper sliced off |
| " | L 10001-50000 | Monel | 39901 | - | Tip of left front flipper sliced off |