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# STUDY OF SEA LIONS AND HAIR SEALS IN CENTRAL AND WESTERN ALASKA

## SUMMARY OF FIELD OPERATIONS MAY TO AUGUST, 1958

by

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# A Study of Sea Lions and Hair Seals in Central and Western Alaska

## SUMMARY OF FIELD OPERATIONS MAY TO AUGUST, 1958

### Background

The decline in the production of the salmon fisheries of Central and Western Alaska in recent years has brought increased pressure by the fishing industry and others for control of important predators, among them the sea lions and hair seal populations.

In order to evaluate the need for control and the feasibility of the task, the U. S. Fish and Wildlife Service initiated a contract with the Fisheries Research Institute in March, 1956, in order to gain needed basic information concerning these animals, including their abundance, distribution, seasonal migrations, and their significance as fish predators.

During the first year of the contract, the photographic census technique developed by Dr. W. F. Thompson during the two preceding seasons was expanded. During the second contract year, a complete census of sea lions and hair seals on rookeries and hauling grounds was obtained for the area from Prince William Sound to the Islands of the Four Mountains ($53^{\circ}$N., $170^{\circ}$W.). Seasonal changes in size of the observed sea lion herds were also disclosed. The largest sea lion population count from Prince William Sound to Unimak Pass was in excess of 70,000 animals. These data regarding numbers of sea lions are basic to all inquiries into their life history and to the consideration of control measures.

During the third contract year, March 20, 1958 to March 19, 1959, a more detailed study of a single area was initiated to study the problems connected with control of the sea lion herds.

### Objectives

The immediate objectives of the field operation during the summer of 1958 were:

1. To study methods of reducing the herd on a rookery. Specifically this involved the technique of killing with regard to weapon, time, and place and the effect of killing as measured by emigration, and replacement through immigration from adjacent rookeries.

2. To study methods of disposal of the killed animals and the best way of handling the carcasses in case a commercial market can be developed for sea lion meat and by-products.

3. To study the food habits of the sea lions through the examination of the stomach content of a representative number of animals throughout the breeding season in order to record any changes which may be associated with the progress of the breeding.

Summary of the 1958 field operations

Chernabura Island, the most southern island in the Shumagin group (Figure 1.), was used for ground observations primarily because the rookeries are more accessible than commonly found elsewhere, and the herds, being in a remote area, were expected to be free of any effect of commercial fishing operations or of other human activities.

Two members of the ground party, Mr. Robert T. Baade, leader of the expedition, and Mr. Benjamin Patton, assistant, arrived with all their supplies at the island on May 18, 1958, aboard the North Pacific Salmon Investigations tagging boat Commander (Figure 2.). That same evening the party was safely landed, and a camp erected. Acknowledgement is due to the captain of the Commander, Mr. Clifford Andersen, and Mr. Allan Hartt, in charge of the scientists aboard the vessel, for invaluable assistance in landing all the supplies.

The third member of the party, Mr. Ron Lopp, biologist in charge of the photographic coverage, left Seattle May 19 and completed his first aerial survey of the Shumagin area May 20 - 22 and joined the ground party May 27. He made a second aerial survey in the period June 14 - July 3, and a final survey on August 2.

Camp was broken on July 26. Equipment was stored temporarily at Sand Point. Personnel returned to Seattle--Patton and Lopp on August 5, and Baade on August 11.

Dr. William F. Royce, Director of the Fisheries Research Institute, visited Chernabura Island July 17 - 20 and inspected the progress of the work and made plans for the closing observations on the rookery.

The work commenced with the preparation of a map of the rookery which contained about 2,000 animals and the establishment of sections for specific purposes. The principal study areas (Figure ) were:

| | | |
|---|---|---|
| Area 1 - | Undisturbed group of animals serving as a control group. | Peak count - 420 animals |
| Area 2 - | Conditioning area. | Peak count - Approx. 1000 animals |
| Area 3 - | Stomach analysis area. (14 samples taken in addition to 100 samples taken from the other areas wherever feasible.) | Peak count - 70 animals |
| Area 4 - | Bull removal area. | Peak count - 60 animals |
| Area 5 - | [illegible] | Peak count - [illegible] animals |
| Area 6 - | [illegible] | Peak count - [illegible] animals |

The remaining parts of the rookery consisted of three areas used by idle bulls (Area A with a peak count of 250 animals, Area B with a peak count of 15 animals, and Area C with a peak count of 175 animals); an incidental hauling area (Area g with a peak count of 25 animals); and two other breeding areas (Areas i and j with peak counts of 150 and 350 animals respectively).

Briefly summarized, the field work consisted of:

1. Four hours of continuous observation five days each week throughout the season of the undisturbed animals in Area 1. This was done on a rotating schedule commencing at 04:00 hours on every Monday, at 08:00 hours on every Tuesday, and at 20:00 hours until darkness on every Friday. A census only of the herd was made on Saturdays and Sundays.

2. Daily firing of one to four rifle shots in Area 2, followed by observation of the behavior of the sea lions.

3. Daily removal of all harem bulls in Area 4 to study the rate of replacement.

4. Daily inspection of the sea lions in Area 5, where killed animals were left, (the number varied from three to seven animals) to study the reaction of the group to the presence of carcasses on the beach.

5. Daily inspection during the entire breeding season of Area 6, where pups had been killed, to study the behavior of the cows and the strength of their association with their pups, both dead and alive.

6. Stomach sampling of 114 adults and yearlings and 22 pups.

7. Observations of hair seals whenever possible.

8. Recording of the behavior of sea otters whenever encountered.

9. Recording of the general weather conditions and ocean swell.

10. Documentation of all phases of the work by photographs, especially the reaction of animals to the various stimuli investigated.

11. Three complete aerial census of all rookeries in the Shumagin area during the course of the field operation to determine the relationship of the Chernabura rookery to the others in the vicinity.

12. Extensive shooting, in the final week, in an attempt to drive the sea lions from the island.

13. Collection of about 40 skulls for possible use in age analysis. To the same end, the reproductive tracts from all cows examined were preserved for shipment to Seattle.

14. Collection of the following quantities of meat for freezing for nutritional and other studies:

    1062 lbs. lean meat.
    190 lbs. viscera (liver, heart, kidneys, spleen).
    277 lbs. head, hide and flippers (from one large bull).

Preliminary results summarized:

A. Life History

1. Pupping observed from May 24 - June 27.

2. Mating observed from May 31 - July 10.

3. Pups weighed 40 - 48 pounds at birth and gained another 50 pounds during the next month.

4. Yearlings were commonly seen nursing, and 25 percent of all yearling stomachs contained milk.

5. Length of full grown males ranged from 9 - 11 feet, and the estimated weight ranged from 1100 - 1500 pounds. One bull examined yielded 375 pounds useable meat, 65 pounds useable viscera (heart, liver, kidneys, and spleen), 277 pounds of hide with flippers and head attached.

6. Length of full grown females ranged from seven to nine feet, and the estimated weight ranged from 400 to 700 pounds.

B. Behavior

1. The harem groups were loosely organized units.

2. The cows hauled to pupping areas rather than to specific bulls.

3. The cow-pup association was very strong. If the pup was removed, the cow searched for her pup for at least two days. She attended and guarded a dead pup from four to five days.

4. Killed harem bulls were replaced within a matter of hours. As a rule, bachelor bulls were unsuccessful in rooting out a bull established in his harem.

5. Presence of dead animals did not prevent the normal use of a rookery.

6. Wounded animals created panic and they led all others to the water where they remained from half-an-hour to three hours before returning to the rookery. This time became longer as the season proceeded.

C. Feeding Habits

1. No organized feeding trips seemed to exist. Single animals left the rookery at all times, day and night, in search of food.

2. The sea lions did not show any food preference. Apparently they took whatever food was most abundant around the rookery. Table I gives a summary of preliminary stomach analyses. Only

one stomach among 114 samples from adults and yearlings contained recognizable salmon remains (Figure 4 and Table I). No traces of halibut were observed. All stomach contents not identified in the field have been preserved for analysis at the Seattle laboratory.

3. A high percentage of stomachs contained either sand or gravel or rocks the size of a fist. (Figure 5.) It is not definitely known how these are swallowed or whether they serve a specific purpose.

D. Methods of Control

1. Careful hunting with rifles equipped with scope sight and silencer is recommended since still or slow-moving objects not directly in the sky-line do not create any concern among the animals. A rifle of the caliber 25-35 is ideally suited for this purpose.

2. Animals can be conditioned to rifle fire prior to the time reduction of the herd commences.

3. All shooting must be aimed toward instantaneous killing, since wounded animals lead all animals to the water.

4. Killing should proceed with the cows, continue with harem bulls and end with single bulls. The pups probably will not survive during the first couple of months of their lives if left alone.

5. Control measures should be undertaken during the height of the breeding season.

6. Animals were driven from the rookery after four days of extensive shooting. Aerial survey seven days later showed that not more than 200 animals of an estimated total population of 1500 animals had returned.

E. Commercial Utilization of Sea Lion Meat

1. It appeared impractical to haul or move the carcasses to a collecting station on the rookery.

2. Instead, the animals must be shot near the water where a line can be attached from the receiving boat to the carcass prior to rolling the dead animal into the surf. Thus secured and in the water, the carcasses may easily be towed around to a ship or a scow.

Preparation of Reports

Mr. Robert T. Baade is presently engaged in writing a final report on the sea lion studies, and Mr. Ron Lopp is completing his report on the aerial census studies.

Table I

STOMACH CONTENTS OF 114 SEALIONS

EXAMINED AT

CHERNABURA ISLAND, 1958

| Category | No. of Stomachs Containing |
|---|---|
| A. Fish | |
| Salmon (Pink) | 1 |
| Smelt | 12 |
| Rockfish | 9 |
| Greenling | 12 |
| Bullhead | 4 |
| Sand Lance | 3 |
| Lamprey | 1 |
| B. Animals Other Than Fish | |
| 1. Crustaceans | |
| Shrimp | 7 |
| Crab | 6 |
| 2. Mollusks | |
| Clam | 25 |
| Mussel | 2 |
| Pecten | 1 |
| 3. Gastropods | |
| Squid | 40 |
| Octopus | 1 |
| 4. Echinoderms | |
| Sand dollar | 1 |
| 5. Annelids | 1 |
| 6. Coelenterates | 1 |
| C. Kelp | 2 |
| D. Miscellaneous | |
| Ballast (Rocks, Gravel) | 67 |
| Sand | 25 |
| Milk* | 4 |
| E. Unidentified Material Probably Fish Remains | 24 |
| F. Empty | 20 |

*Yearlings. 25 per cent of yearlings contained milk along with other food.

List of Figures

(Attached to first ten copies only)