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Bird and Mammal Investigations

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ANNUAL REPORT, 1960: BIRD and MAMMAL INVESTIGATIONS

During 1960, the staff of the Birds and Mammals section, conducted studies on marine mammals, wolves, parasites of Alaskan vertebrates, and on the physiology of molt in the king crab. In addition, a collection of representative specimens of birds, mammals, and plants has been started as an informal supplement to other projects. Collection and identification of plants has been facilitated by the generous technical assistance of Dr. Bonita Neiland.

The status of work on marine mammals and wolves is briefly reviewed in the following sections. Kenneth A. Neiland has reviewed the invertebrate studies in a separate report.

Studies on avian predators of salmon have been continued as an adjunct to the marine mammal studies, but data obtained in the 1960 field season has not been analysed and is not included in this report.

MARINE MAMMAL STUDIES by Calvin J. Lensink

Marine Mammal Investigations include projects on Sea Lions, Belugas, Harbor Seals, and Sea Otters. With the exception of the sea otter, all projects are a continuation of studies initiated by the former Division of Predator Investigation and Control. The projects are under various stages of completion and the following accounts by species for the most part summarizes only the general progress of field investigations.

Sea Lion

Work on sea lions in 1960 was limited to a follow-up on a tagging program initiated in 1959, and to the processing of specimens collected during earlier stages of the investigation.

In July 1959 a total of 312 sea lion pups were tagged at Sugarloaf Island in the Barren Islands. Observations indicate that this Island is a major pupping rookery but that many females with yearlings move to other rookeries in Prince William Sound and the Kodiak areas. The Lewis Island rookery in Prince William Sound and the Marmot Island rookery in the Kodiak Archipelago were checked for tagged yearlings in July 1960, but none were observed. The tagging program will be expanded in 1961 because of the increasing need for information on population structure and movements resulting from the initiation of private sea lion harvesting operations in 1960, and the continuing demand from commercial fishermen for control of depredation by

sea lions on the salmon, black cod and halibut fisheries.

Canine teeth from approximately 200 sea lions have been sectioned to determine the age structure of the population. A sample of 179 males, all taken from breeding rookeries indicates that although males are sexually mature when they are 7 years old, most are not physically able to compete for harems until they are 9 years old. Over 90 percent of harem bulls are between the ages of 9 and 13 years. The surplus of males is so great even in this small age segment of the population, that moderate removal of harem bulls during harvest operations or by retirement during latter stages of the breeding season, has not resulted in spreading the age distribution of males found on breeding rookeries.

Sea Otter

Experimental aerial surveys of selected areas in Prince William Sound were conducted to provide some measure of the reliability of population estimates. Results of the experimental surveys were not sufficiently conclusive to permit the establishment of correcting factors for general survey figures, but served to point out the considerable variation in census figures. Such variation resulted primarily from difference in type of survey aircraft and fluctuations in weather conditions. Extensive movements of sea otters within the general range of a given population and the factor of contagious distribution caused so serious an error that incomplete surveys are essentially valueless in formulating population estimates.

The following results from complete surveys of the Kayak-Wingham Island population serves to point out variations which may be anticipated:

<u>Date</u>	<u>Aircraft</u>	<u>Weather</u>	<u>Sea Otters Observed</u>
4/27/59	Cessna 180	Cloudy, light swell, sea 0	144
8/10/59	Cessna 180	Cloudy, light swell, sea 0	163
8/10/60	Grumman Widgeon	Clear, light swell, sea 0	97
6/21/60	Grumman Widgeon	Cloudy, heavy ground swell on outer coast. Moderate chop in Controller Bay.	122
6/22/60	Cessna 180	Clear, moderate ground swell, heavy chop at Wingham Island and in Controller Bay	78

It is evident that cloudy skies and smooth water provide optimum survey conditions, and that sun glare and choppy water cause sharp reduction in counts. Observations in other areas confirm the results tabulated above. It thus appears that if population estimates are based solely on aerial censuses, the results will almost certainly be unduly conservative.

A final report on all phases of sea otter studies is near completion. No further field investigation of the sea otter is contemplated by the Division.

Harbor Seal

No formal program of study has been initiated on the harbor seal, although this animal is of rapidly increasing value as a furbearer. However, a considerable volume of material related to food habits, reproduction, growth, and age distribution has been obtained during the course of control operations and other research projects. Work on harbor seals will be expanded as projects on other species are completed or require less effort.

Beluga

The beluga whale study initiated in 1954 has been continued by the Division of Biological Research. These studies, in the Bristol Bay region, are aimed at evaluating the losses to the fishery caused by belugas, at devising means of controlling beluga depredations, and to determine the implications of beluga control on the welfare and ecology of the Bristol Bay region.

A population estimated at 500 to 1000 animals is found in Bristol Bay, mostly in the estuaries of the Kvichak and Nushagak Rivers. During periods when fish are abundant in the river as a result of migration either to or from the ocean, large numbers of belugas seize advantage of this concentrated and vulnerable food source and make extensive foraging migrations above the bays. Although much of this upriver foraging is directed to smelt, a non-commercial fish, both young salmon during migration to the sea and the returning adult salmon are vulnerable during the interval they are in the river.

Earlier examination of the stomachs from more than 150 belugas by James Brooks indicated that depredations upon young salmon in the narrow confines of the river was far more serious than on the more scattered fish in the outer bays. Depredations on the young seaward migrant red salmon smolt was considered to be the most critical problem, particularly in years when the number of migrant smolts are small.

Although losses to the salmon fishery may be potentially serious, belugas are of considerable value as a food resource for Eskimos living along the Bering Sea. We do not know, however, the extent that Bristol Bay belugas mix with other coastal populations and what they contribute to the welfare of coastal residents. Fifty belugas have been tagged recently in the hope that these marked individuals will eventually provide this information.

Because belugas are an important segment of Eskimo economy and are a potentially valuable game species, control measures were sought which would not be wasteful of this resource. Emphasis has been placed on protection of the seaward migrant smolt.

Attempts to drive belugas from the river by chasing them with boats were partially successful but they returned on each high tide and storms or darkness frequently prevented adequate protection to the fish. Harassment with small dynamite bombs in conjunction with boat operations, however, conditioned the belugas to the danger of upriver movements. A few days harassment prior to the presence of migrant fish in the river provided protection for the entire period of smolt migration in 1960.

It is anticipated that the beluga study will be completed during 1961.

WOLF MANAGEMENT STUDIES

by Paul Garceau

Wolf studies initiated in 1958 in Southeastern Alaska were continued in 1960 in an effort to determine the effect of wolf predation on the Sitka black-tailed deer. The project is financed by the Division of Biological Research under a Federal Aid matching fund contract and is listed as Federal Aid Project K, Job 1, 2, and 3.

Distribution and Movements:

Wolves were found throughout Southeastern Alaska with the exception of Baranof, Chichagof, and Admiralty Islands. Frederick Sound, Stephens Passage and Icy Strait appear to act as physical barriers which restrict the establishment of wolves on these islands.

The extent of wolf movements between islands is not fully known, but wolves are excellent swimmers, and their crossing of narrow channels is considered to be quite common. Movements across water barriers of at least a mile are known, and passages

such as those from Kuiu to Kupreanof to Mitkof Islands and then to the mainland are less than a half mile and present no major obstacles. Similarly, Revillagigedo and Wrangell Islands are within easy swimming distance of the mainland, and Etolin Island is separated from Wrangell Island by barely a quarter mile at low tide.

Light snowfall, mild weather, and poor flying conditions during the winter of 1959-1960 generally precluded tracking and census of wolves by air. Observations of three wolf packs which cover a total of movements for at least 8 days during February of 1959 are summarized in Table 1; additional observations of distances traveled by wolves but for which time intervals are not precisely known are given in Table 2. These limited observations indicated that each wolf consumed about .16 deer each day or about 1 deer every 6 days during winter months. Distances traveled by individual packs varied from 8 to 30 miles in two days.

Food Habits:

Existing information on food habits indicates that Southeastern Alaska wolves are almost entirely dependent on deer. In 131 fecal samples collected at dens and along trails, 95 percent contained deer remains, 15 percent beaver remains, 5 percent mice, and 3 percent birds. Most deer taken in spring or summer months were fauns. The degree to which beaver and other foods act or are important as buffer species cannot be shown until deer numbers fall considerably below their present level of abundance.

Den Studies:

In August of 1958 a wolf denning area was found on Kupreanof Island. Tracks of pups were identified, but these were apparently already traveling with the adult animals. A male pup weighing 78 pounds was killed at the den site on October 23.

The area was again visited on May 18, 1959 and the den relocated. On this visit the den was occupied by 7 pups, their parents, and at least 3 animals remaining from the previous year's litter.

The den was situated at the end of a bay and about 15 yards within the edge of the timber bordering wide tidal flats. It consisted of an excavation under a decaying hemlock snag or stump that was about 12 feet high and had a diameter of 36 inches 4 feet above the ground. The main entrance (about 15 inches high and 19 inches wide) was located about 4 feet below the base of the stump. A secondary entrance of about 10

inches in diameter was located on the opposite side of the stump. A tunnel sloped inward and down for 90 inches from the main entrance to the den's lowest level which was 18 inches below.

Growth of Captive Wolves:

Seven pups considered to be three to five weeks old were taken from the den and held at the Experimental Fur Farm in Petersburg for observation of growth and food requirements. By six months of age the five males averaged approximately 80 pounds. This weight is not significantly different from that of the male pup of the same age taken at the same den in October 1959 and presumably a full brother. At this age, however, the two females weighed between 60 and 70 pounds.

At approximately one year of age the largest male weighed 114 pounds and the lightest 90 pounds. Females averaged only 78 pounds. No significant increase in weight occurred during the following 6 months, and it appears that wolves attain adult size by the end of their first year of life. The seven captive wolves averaged only slightly more in weight at full growth than wolves in the wild, and the difference may be almost entirely due to excessive fat accumulations resulting from their inactivity.

Food consumption increased from an average intake of 0.5 pounds per day when the pups were about 4 weeks old to an average of 8.1 pounds per day at 9 to 10 months age. The greatest food consumption was coincidental with the coldest months and decreased to approximately 70 percent of maximum during the warmer weather of March and April.

Reproduction:

Reproductive organs obtained from wolves that were bountied or taken in control operations were preserved for laboratory examination. Examination of 12 male and 11 female reproductive tracts indicates that males are sexually mature at age two. The first estrous in females may occur at two years, but some older animals, perhaps may, do not bear litters. The data suggests that reproductive failure rather than mortality of either young or adults is the primary control on wolf population.

Age Classification:

Studies to date indicate that the age of wolves can be estimated with fair accuracy for early years by use of such features of the skull as the degree of ossification, the development of the sagittal crest, and the appearance of the angle of the ramus. A consideration of the time of the year that

wolves were killed permits considerable precision in some estimates. Combinations of skull measurements, the internal structure of teeth, and the status of reproductive organs provide further clues to the correct age. Of 33 skulls that have been examined, 18 appeared to be from animals less than one year of age, 6 from animals between 1 and 2 years old and 9 from animals that were older than 2 years.

Relationship of Wolf and Deer Populations:

Accurate census of wolves is not practical in Southeastern Alaska, but bounty returns, hunter reports, field observations, and aerial surveys permit classification of abundance into the general categories of "high", "medium", and "low" populations. Analysis of present population estimates for wolves and deer indicate that areas with medium to high wolf populations in general also support the best deer populations and provide the best hunting. That this parallel of wolf and deer populations is a mutual relationship rather than one in which only the wolf is benefited is indicated by the persistent nature of the relationship, by the general vigor of the deer population as indicated by age ratios of hunter killed deer, and the superior range conditions which exist in areas with high wolf populations.

Four wolves, 2 males and 2 females, raised in captivity, have been released on Coronation Island. The deer and their range were intensively studied prior to the liberation of the wolves by David R. Klein (Division of Fur and Game, Federal Aid Project A-1F) and thus it should be possible to evaluate with some precision the impact of a known population of wolves on deer in a restricted habitat.

TABLE 1: OBSERVATIONS OF WOLF PACKS IN SOUTHEASTERN ALASKA

<u>Observation Number</u>	<u>1*</u>	<u>2*</u>	<u>3*</u>
Number of wolves in the pack	9	5	9
Number of days movements accounted for	3	3	2
Linear distance covered in miles	16	21	8
Number of observed deer killed	2	2	3
Minimum number of deer killed/day	.6	.6	1.5
Minimum number of deer killed/day/wolf	.1	.1	.2
Calculated days between kills/wolf	13.5	7.5	6

- 1* Orchard Lake, Revillagigedo Island
- 2* Patching Lake, Revillagigedo Island
- 3* Moser Bay Lakes, Revillagigedo Island

TABLE 2: OBSERVATIONS OF DISTANCES TRAVELLED BY WOLVES

<u>Date</u>	<u>Location</u>	<u>No. Wolves</u>	<u>Miles</u>	<u>Duration</u>
Feb. 12, 1959	Periphery Sweetwater Lakes, Prince of Wales	2	3	6 hrs.
Feb. 14, 1959	Thorne River to Sweet- water Lakes	6	30	Less than 2 da.
Feb. 14, 1959	Big John Bay to Salt Chuck, Kupreanof Is.	?	12	"
Feb. 17, 1959	Thorne Bay to Klawock Inlet and return, Prince of Wales Island	?	30	Less than 3 days