WORK PLAN G: Fur Mammal Investigations

JOB NO. 5: Sea Otter Abundance, Distribution, Movements and Composition Studies

PERIOD COVERED: July 1, 1959 - May 1, 1960

ABSTRACT

1. Aerial surveys indicate minimum sea otter populations of 200-250 animals in the Kayak-Wingham Island area, 850-1,300 in Prince William Sound, 1,000-2,000 in the Kodiak Archipelago, and 75-125 at Augustine Island. There were no sea otters observed between Cape Douglas and Cape Providence on the Alaska Peninsula.

2. Movements of otters appear to have occured in all populations. Movements in the Kayak-Wingham Island area, may involve establishment in a new foraging area but those in Prince William are probably normal seasonal movements. Possible movements of sea otters between Shuyak Island and the Barren Islands in the Kodiak Archipelago are suggested by survey data but are not understood.

3. Considerable variability in survey counts indicates that light aircraft such as the Pacer or Cessna 180 are much superior to the heavier Grumman Widgeon for sea otter surveys.

4. Recommendations include the continued protection of sea otters in the area covered by this report, and a repetition of surveys to provide a better understanding of movements in sea otter populations and to better determine the effectiveness of various aircraft for surveys.

PURPOSE

Between 1956 and 1957 sea otter habitats in the Kodiak Archipelago along the Alaska Peninsula and in part of the Aleutian Islands had been surveyed by the Fish and Wildlife Service. During 1959 the Service planned to complete surveys in the Aleutians leaving only the Prince William Sound area unsurveyed. Consequently the Department of Fish and Game proposed to survey the Prince William Sound area, as well as the Kodiak Archipelago and part of the Alaska Peninsula where earlier survey results were believed unreliable. These surveys would thus complete a survey of all Alaska sea otter

habitats and with the repetition of surveys in Prince William Sound, the most accessible area, would also provide information on movements of sea otters and on the reliability of various aircraft that have been used on surveys.

OBJECTIVES

To determine the abundance, distribution, sex and age composition, and rate or tendency for dispersal of sea otters in Prince William Sound, in the Kodiak Archipelago, and along the Alaska Peninsula with its adjacent islands.

PROCEDURE

Aerial surveys were flown in the Kodiak Archipelago and from Augustine Island to Cape Providence on the Alaska Peninsual, July 22-30, 1959; in Prince William Sound, August 9-10, 1959 and April 9-12, 1960; and in the Kayak-Wingham Island area and August 7, 1959, and April 10, 1960. Chartered commercial aircraft were used on all flights.

In the Kodiak Archipelago surveys were conducted with a Piper Pacer piloted by Bill Harvey of Harvey's Flying Service; and in the Prince William Sound and Kayak-Wingham Island areas with a Cessna 180 and Grumman Super Widgeon piloted by Cal Ward, Ben Calhan or Jim Osborne of Cordova Airlines. All pilots except Osborne have had experience in flying wildlife surveys and all proved capable and cooperative. Characteristics of the aircraft used are summarized below:

Aircraft	Air Speed on Survey	Remarks
Pacer	95 m.p.h.	Maneuverable. Excellent visibility for pilot and one observer and fair for a second observer.
Cessna 180	90 m.p.h.	Same as above.
Grummans Super Widgeon	110 - 115 m.p.h.	Less maneuverable than the preceding planes but the two engines provide a safety margin for offshore flying. Visibility is good for pilot and one observer. Communication is difficult for second observer.

Calvin J. Lensink was an observer and in charge of all flights. Other observers who assisted on one or more flights include Ralph Pirtle, Arthur Sheets, Paul Garceau, and Charles Wells of the Alaska Department of Fish and Game.

Survey flights were restricted to period when good to optimum visibility conditions prevailed. Wind velocities greater than 10 knots or which produced marked chop on the water surface were considered substandard and cuased cancellation of flights. Most surveys were flown during conditions under which the water was "mirror" calm. Sun glare from the water was the most adverse condition encountered.

All flights were conducted between 0800 and 1800 hours with fueling breaks at noon. This period for flights corresponds with normal foraging routines of sea otters and data from various time segments of flights should be comparable.

The routine flight path paralleled the shoreline at an altitude of 300 to 400 feet and at a distance of approximately 1/8 to 1/2 mile offshore, depending on the character of the shoreline and water depth. Large open water areas were generally crossed at an altitude of 400 to 600 feet to increase the area of visibility. Detours in the flight path were made to examine all small, off-shore rocks or islets and beds of kelp or to completely cover shallow areas of large bays. Detours were also made to examine all objects distantly visible on the water's surface that could not be identified from the normal flight path.

Population estimates are based on the premise that only 50 to 75 percent of animals present are observed under optimum survey conditions. That even this estimate may be conservative is suggested by the following observation:

1. Ground and boat surveys on Amchitka, Kanaga and Adak Islands indicate that pups may form from 15 to 22 percent of the population, but are seldom identified during aerial surveys.

2. Surveys are flown during active foraging periods when many otters are submerged.

3. Repeated discovery of even large groups of animals on a second passage over an area indicates that

fishermen have long known of the existence of sea otters at Kayak and Wingham Islands but are unanimous in their observation that sea otters were seldom encountered previously in Controller Bay.

The present population of sea otters in the Kayak-Wingham area probably numbers between 200 and 250 animals.

Prince William Sound: A total of 541 sea otters was counted in Prince William Sound on surveys with a Cessna 180 in August 1959 and 361 in April 1960 surveys with the Grumman Widgeon. As in the case of the Kayak-Wingham Island area, distribution changes had occured in the interval between the surveys.

Nearly all sea otters present in Prince William Sound are found in the vicinity of Hinchinbrook, Montague, Green, Latouche, Elrington and Evans Islands although occassional strays may be observed far removed from population centers. The distribution of sea otters is clearly correlated with the amount of shallow water in which they can obtain food.

The most noticable changes in distribution between the two surveys was a shifting of animals from Hinchinbrook and Montague Islands to the Latouche-Elrington Island area. The distribution change was not nearly so prominent, however, as that which occured at Kayak Island and may have resulted from normal seasonal movements. Distances involved, however, are greater with minimum distance of travel at least 8 miles in water too deep for foraging. Some otters probably moved as much as 35 miles.

Variation in total count was of approximately the same magnitude as occurred in the Kayak-Wingham Island area, and suggests the inadequacy of the Grumman Widgeon as a survey aircraft.

An estimate of a sea otter population of 850-1300 animals in Prince William Sound is based on the August 1959 survey. Distribution of this population is indicated in the following summary:

Area	Counts	Estimates
Hinchinbrook Island	58	75- 125
Montague Island	349	500-700
Green Island	42	125-175
Latouche-Elrington Island area	87	50-100
Other, including reports in unsurveyed areas	28	100-200
		850-1300

observers fail to notive many animals although they are within the flight path.

4. Because of the vast areas involved the flight path covers only those areas where otter concentrations are to be expected. Animals well off-shore or occassionally come near the shore are thus not considered.

Previous surveys by the Fish and Wildlife Service within the area covered by this report which provide comparable data include boat and aerial surveys of the Kodiak Archipelago in 1957, an aerial survey of the Shuyak area of the Kodiak Archipelago in 1958, a boat survey of the Alaska Peninsula in 1957, and an aerial survey of Augustine Island in 1957. Lensink participated in all surveys with the exception of the aerial surveys of the Shuyak area in 1957 and 1958 and the Augustine Island area in 1957. The Prince William Sound and Kayak-Wingham Island areas had not been surveyed prior to the present investigation.

FINDINGS

Kayak-Wingham Island Area: The August 1959 surveys in the Kayak-Wingham Island area with a Cessna 180 resulted in a total count of 165 sea otters, whereas the April 1960 survey with a Grumman Widgeon accounted for only 97 animals. On the earlier surveys the majority of the animals (109) were found scattered along the Southeastern shoreline of Kayak Island and a large group of 52 in Controller Bay included most of the remainder. In April 1960, however, only 3 sea otters were encountered on all of Kayak Island but 82 were found in scattered groups in Controller Bay. Error in counting of animals in the large open water area in Controller Bay on the latter survey caused by lack of reference points for orientation as to area covered, and the greater fear reaction of animals to the larger, noisier plane, may in a large part account for the variation in survey totals.

During a survey of harbor seals with a Cessna 180 on April 29, 1959, a total of 94 sea otters was encountered at Kayak and Wingham Islands. Controller Bay was not covered, however, on May 1 about 50 animals were observed in the Bay from a boat, and were believed to have been missed on the aerial survey. The distribution change may thus not be merely a seasonal shift but rather a major shift in a foraging area though distances involved are from less than one mile to a maximum of no more than 20 miles. Local

Kodiak Archipelago: Aerial surveys of the Kodiak Archipelago in July 1959 with a Piper Pacer accounted for a total of 667 sea otters of which 395 were observed in the Shuyak Island area and 272 in the Barren Islands. No otters were seen in the Trinity Islands although reports which are considered reliable indicate the presence of animals in that area. The various reports, mostly by fishermen, were verified by Fisheries Research Institute Biologist Ronald Lopp who counted 15 animals at Sitkanak Island in 1957.

During boat surveys in June 1957, 94 otters were counted in the Shuyak area and 117 in the Barren Island. The boat surveys were immediately followed by aerial surveys in a Super Cub from which FWS Refuge Manager Willard Troyer counted 281 animals in the Shuyak area and 234 in the Barren Islands, although coverage was incomplete in the latter area. In August 1958 aerial surveys Troyer counted 581 animals in the Shuyak area but did not survey the Barren Islands.

The discrepancy between the counts for the 1957, 1958, and 1959 aerial surveys of the Shuyak area (281,581, and 395) strongly suggests movements by sea otters between Shuyak Island and the Barren Islands, a distance of 14 miles. If movements do not cause the discrepancy, the aerial surveys are considerably more variable in results that we suppose.

Estimates of the magnitude of the sea otter population in the Kodiak area must account for either movement of lack of movement between Shuyak Island and the Barren Islands and also for the uncertainty of observations on the Trinity and Chirikof Islands population. Thus the estimate of 1000 to 2000 animals in the total population as summarzed below takes both possibilities into consideration.

	Observation	Estimates
Shuyak Island	395-581	525- 975
Barren Islands	272	350- 450
Trinity and Chirikof Islands	14	100- 400
	Rounded Total	1000-2000

Alaska Peninsula: During July 1959 surveys with a Pacer, 52 otters were seen at Augustine Island but the count was considered conservative because a boat had just been around the island and had caused an off-shore scattering of animals. In addition it was not possible to survey the adjacent mainland where animals have been reported. No sea otters were observed

in the 180 mile area between Cape Douglas and Cape Providence.

The results of the 1959 survey largely confirm the results of the 1957 boat and aerial surveys. FWS Refuge Supervisor David L. Spencer counted 40 animals at Augustine Island but none on the adjacent mainland in aerial surveys with a Grumman Widgeon. As in 1959, no otters were seen in boat surveys of the area between Cape Douglas and Cape Providence, although satisfactory habitat is plentiful and expansion of adjacent populations into this area should soon occur.

The total population at Augustine Island probably numbers between 75 and 125 animals.

RECOMMENDATIONS

1. Although sea otter populations in the region covered by this report appear to have increased rapidly in the last decade, there is still sufficient habitat for considerable expansion of the population, and there should be no change in the policy which now provides complete protection for animals in the area.

2. Surveys should be repeated in the Shuyak Island and Barren Islands to provide conclusive evidence of movements of sea otters between the two areas.

3. Surveys should be repeated in Prince William Sound and the Kayak-Wingham Island areas with both the Cessna 180 and the Grumman Widgeon to provide an index to the variability inherent in aerial census of sea otters and to determine how the type of aircraft used in surveys may effect counts. Present survey figures as summarized below suggest that variation in counts resulting from different types of aircraft used in surveys is significant.

Area Surveyed	Cessna 180	Grumman Widgeon	Percent increase with Cessna
Kayak-Wingham Island	165	97	70
Prince William Sound	541	361	50
Augustine Island	52	40	25
Totals	758	498	52