Distribution and Abundance of Sea Otters in the Kenai Fiords

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INTRODUCTION

Increases in subpopulations of sea otters, range expansions into areas also used by humans, and their ability to greatly reduce the abundance of sea urchins, mussels, clams, abalones, and dungeness crabs are causing a growing concern among recreational, commercial, and subsistence users of shellfish in some areas. Areas where otters are probably over-populated and competing with humans for the same shellfish resources are Atka, southern Kenai Peninsula and parts of Prince William Sound. Other areas where the increase of sea otters is eventually expected to cause the same problem are the Kodiak Archipelago, the south side of the Alaska Peninsula, north Gulf Coast and southeast Alaska. These are all areas where human populations are utilizing shellfish resources that otters prey upon. Not resolving the problem of high numbers of sea otters in some subpopulations will intensify competition between otters and humans. This in turn will heighten animosity toward sea otters and lead to increased illegal killing. Other ecological impacts of sea otters are expected but few have been documented. In some areas predation by sea otters has reduced invertebrate grazers and kelps have increased. Obviously, changes in primary production and the assemblage of primary producers is likely to have pronounced effects on other marine community components.

The study was conducted on the southern coast of the Kenai Peninsula, between Seldovia and Aialik Cape. The seacoast in this area is administered by the Alaska Department of Natural Resources and the U.S. National Park Service. It

is essentially uninhabited. Narrow, fjord-like bays form the eastern coast of the peninsula, and islands are common all along the route followed by the surveys. Coastal waters are exploited for shrimp, crabs, shellfish, and bottomfish by subsistence, recreational, and commercial fishermen.

A preliminary study of sea otters of the outer Kenai Peninsula was accomplished this last field season. The overall goal of this study was to gather baseline information concerning sea otters that would assist the Service in determining the necessity and feasibility of controlling sea otter numbers in areas of conflict with shellfish user groups. Specific objectives include:

1) Precisely locate observation points of individual and groups of sea otters;

2) Map areas of sea otter concentrations; and

3) Determine the percentage of dependent young.

METHODS

Surveys were conducted from 18 to 25 May, from 25 June to 1 July, and on 1 Sept. 1982. The surveys respectively covered the coastline from Seldovia to Resurrection Bay. The Service vessel Sea Otter, a twin screw, 32 ft. motor vessel of approximately 7 tons displacement served as the survey platform. The vessel traveled within 100 yards of shorelines at speeds of 5 to 10 knots. The high deck of the Sea Otter afforded the observers an excellent vantage point. Sea otters would have been difficult to observe in a smaller vessel due to the constant Pacific ground swell along the exposed coastal area of the Kenai Fiords.

Two observers stood on deck and recorded marine mammal sightings. The number and approximate ages (adult or dependent young) of sea otters sighted and the number of other marine mammals sighted were recorded. Also noted were the time of the sighting, the water depth, and the geographical coordinates of each observation. During the first survey, a Navidyne ESZ-7000 Loran C navigation system was used to continuously monitor the vessel's position, but its readings proved to have a 200 to 500 meter error. On the second and third surveys, the vessel's approximate position was plotted on large-scale charts and later the plotted points were converted to geographical coordinates.

RESULTS

In the study area 880 adult sea otters with 156 dependent young were recorded. Observations were made at 223 locations, all of which are plotted on maps held on file. Twenty of these localities accounted for 469 adults, or 53% of all adults sighted. Groups of sightings are considered to be local population centers. The area from Point Adam to Chugach Bay, including the Chugach Islands, supports a large population, in all accounting for about 50% of the adults observed.

In the southwestern part of the Kenai Peninsula 607 adult sea otters with 94 (15.5%) dependent young were recorded. In the southeastern segment 273 adults with 60 (21.9%) dependent young were recorded. This might be interpreted to indicate a high percentage of females with 1-year reproductive cycles in the southeastern Kenai area, where sea otters are more sparsely distributed than on the southwestern coast. However, the fact that exclusively male concentrations were only observed in the southwestern segment would suggest a closer ratio of dependent young to adult females between the two areas.

DISCUSSION

The concentration of sea otter sightings at the southwestern tip of the Kenai Peninsula supports the suggestion of Calkins et al. (1975) that the Barren Islands were a source of immigration into the area. If the number of individuals observed per mile of shoreline can be considered an estimate of density, sea otters were more sparsely distributed on the southeastern side of the peninsula. No more than 3 adults were observed at any locality east of Nuka Bay. Exclusively male concentrations occurred no farther east than Rome Point.

The overall percentage of dependent young (19.3%) is higher than Kenyon's estimate of 14.5% for the theoretical maximum annual rate of reproduction at Amchitka, where 69% of the population was of reproductive age. Kenyon's estimate assumed a 2-year female reproductive cycle. If some females exhibited a 1-year cycle, the theoretical maximum rate would be greater (Johnson 1982). A summary of 29 sea otter surveys in 3 states produced 7 surveys with pup:adult ratios greater than or equal to 18:100 (15.2% dependent young) (Jameson et al. 1982). However, none of these surveys had a sample size greater than 100 individuals.

The Kenai sea otter population probably increased at a rate greater than the 12% reported by Kenyon for a low density population in newly occupied habitat, at least during the first years after its reestablishment. The increase from essentially 0 in 1965 to more than 1000 in 1982 is greater than any rate reported for transplanted populations (Big and MacAskie 1978, Jameson et al. 1982). Many new immigrants were probably recruited in addition to newborn young.

Sea otter abundance seems positively, if at all, correlated with abundance of other marine mammals. Ninety percent of the sea lions and 50% of the sea otters observed in this study were counted in the Point Adam to Chugach Bay area. This area also supports a large population of harbor seals (Calkins et al. 1975), but it comprises less than 17% of the total shoreline distance covered by the surveys. There is no evidence that sea otters compete for food with or are preyed upon by any species of marine mammal other than killer whales (Kenyon 1969:102-103, 279).

A pair of sea otters were observed copulating at the west arm of Port Dick (locality 106 on the filed maps). Water depth at this locality was approximately 60 feet (18 m). The observation occurred on 24 May at 1744. Kenyon (1969:236) lists May and June as the peak periods of sea otter breeding activity in Alaska.

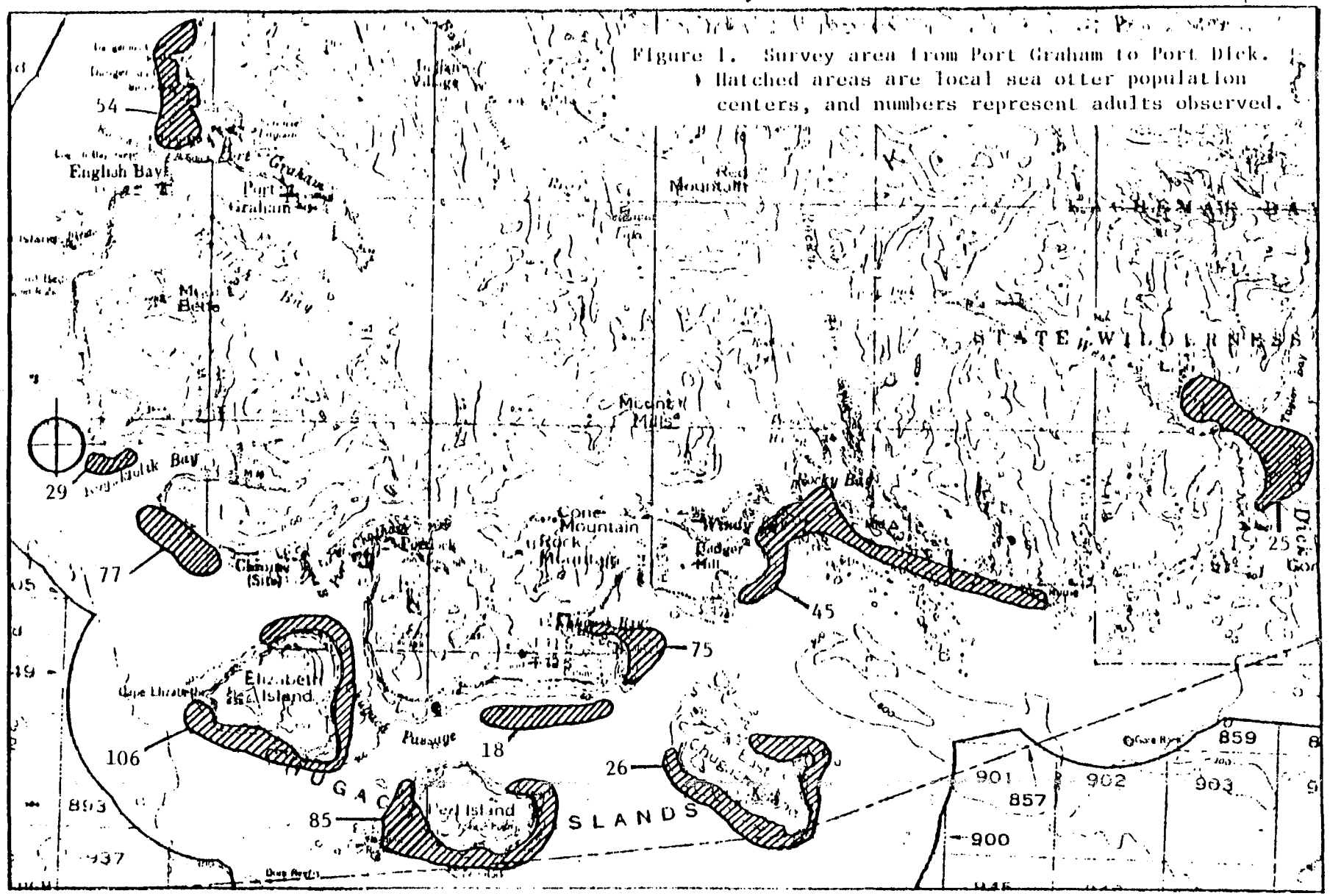

Figure 1. Survey area from Port Graham to Port Dick. Hatched areas are local sea otter population centers, and numbers represent adults observed.

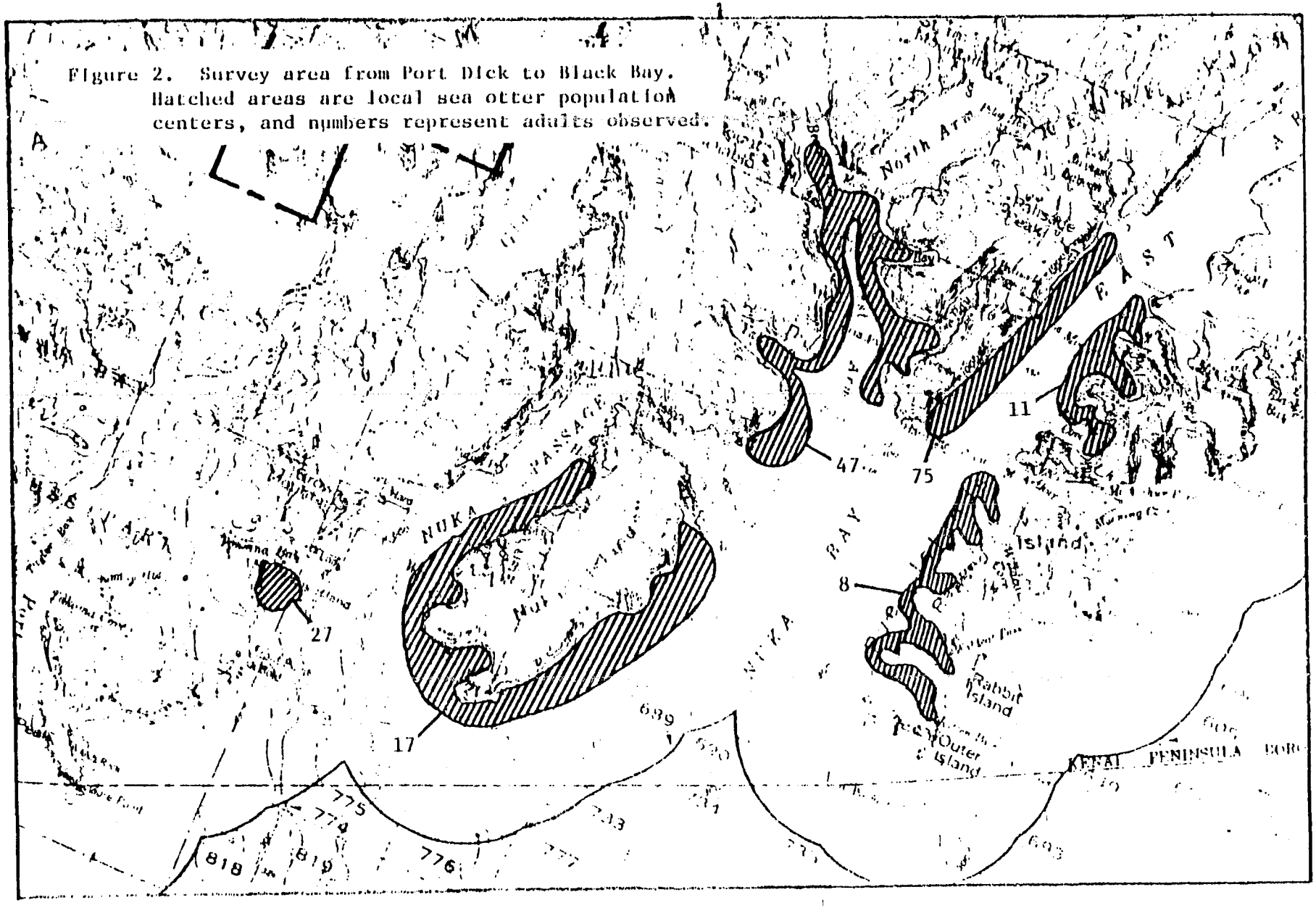

Figure 2. Survey area from Port Dick to Black Bay. Hatched areas are local sea otter population centers, and numbers represent adults observed.

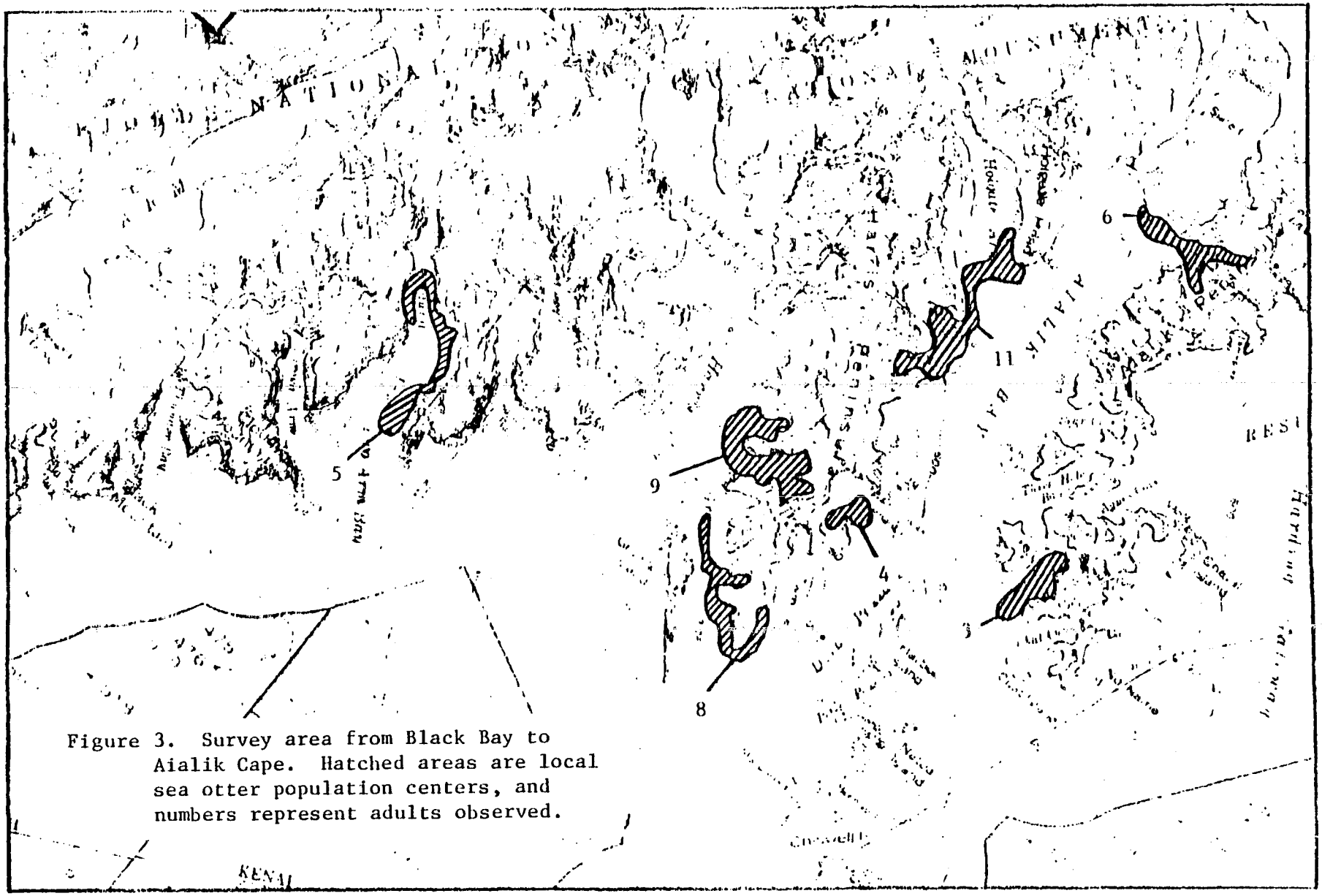

Figure 3. Survey area from Black Bay to Aialik Cape. Hatched areas are local sea otter population centers, and numbers represent adults observed.

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ADDENDUM

The maps of sea otter and other marine mammal sightings are stored in the Marine Mammal Project's map files. Six NOAA navigational charts (2 copies each of number 16645, 16681, and 16682) were used as base maps. The original field notebook listing locality number, date. time, water depth, number of animals sighted, and geographical coordinates for each observation os also filed.

The locality positions plotted on the charts numbered 16645 are inaccurate. The Loran navigational aid recorded positions that were displaced roughly southeastward of the true positions by some undetermined distance. The displacement was probably no greater than 500 m.

Participants in one or more of the surveys included R. D. Jones, J. C. Malloy, J. M. Merk, W. T. Schmidt, B. S. Schwahn and J. B. Stengle.