Status of a Translocated Sea Otter Population and Its Habitat in Washington
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STATUS OF A TRANSLOCATED SEA OTTER POPULATION AND ITS HABITAT IN WASHINGTON

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During the summers of 1969 and 1970, the Alaska Department of Fish and Game and the Washington Department of Game translocated 59 sea otters from Amchitka Island, Alaska, to release sites in Washington (Jameson et al. 1982, Wildl. Soc. Bull. 10:100–107). Of the 29 released near Pt. Grenville (Fig. 1) in 1969, 16 are known to have died. In 1970, 30 otters were held in a floating enclosure anchored near James Island, off La Push. They were released nearby in excellent condition on 21 July 1970. Results of surveys from 1977 to 1981 were reported by Jameson et al. (1982). The purpose of this note is to report subsequent additional observations for 1983 and 1985 on the abundance, distribution, and habitat of the sea otter population in Washington.

Study Area and Methods

Surveys were conducted from a 20-foot boat using 10 × 50 and 8 × 30 binoculars and, wherever possible, from shore using a 50–80× high resolution Questar telescope. Areas traditionally surveyed from shore include Destruction Island and the Cape Alava–Sand Point area. It is probably impossible to see all sea otters on any survey. However, we tried to make our counts as comparable as possible by surveying only when conditions were favorable.

In addition to surface surveys, periodic aerial surveys of all marine mammals were conducted by one of us (SJ) for the Washington Department of Game. Data from one of these surveys helped to complete our 1985 census (Table 1), and have established the fact that at present, sea otters do not regularly occur beyond the boundaries of our surface survey area, which extended from Neah Bay to Destruction Island (Fig. 1).

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TABLE 1. Sea otter surveys of the Washington Coast, 1977–1985.

Year	Date and location	Class: Independent	Class: Pups	Total	Pup : independent ratio
1977	1 Jul/Destruction Island	3	3	6	
	1 Jul/Giants Graveyard	3	1	4	
	1 Jul/Bald Island	1	0	1	
	4 Jul/Bodelteh Islands	8	0	8	
	Total	15	4	19	27:100
1978	28 Aug/Destruction Island	6	0	6	
	27 Aug/Sandy Islands	5	0	5	
	27 Aug/Bodelteh Islands	1	0	1	
	Total	12	0	12	0:100
1981	14 Jul/Destruction Island	3	0	3	
	15 Jul/Cape Johnson-Sandy Islands	10	1	11	
	15 Jul/Sand Point	1	0	1	
	15 Jul/Cape Alava-Bodelteh Isls.	21	0	21	
	Total	35	1	36	3:100
1983	13 Sep/Destruction Island	6	1	7	
	15 Sep/Cape Johnson	8	1	9	
	15 Sep/Sand Point	2	0	2	
	15 Sep/Ozette Island	13	2	15	
	15 Sep/Cape Alava-Bodelteh Isls.	19	0	19	
	Total	48	4	52	8:100
1985	24 Jul/Destruction Island	7	1	8	
	26 Jul/Sand Point	7	2	9	
	10 Jul/Sand Point	24	0	24*	
	27 Jul/Cape Johnson	4	0	4	
	27 Jul/Jagged Island	8	1	9	
	27 Jul/Cape Alava, Ozette, and Bodelteh Islands	10	1	11	
	Total	60	5	65	8:100

* This figure represents a single group of otters observed by one of us (SJ) during an aerial survey on 10 July 1985. The group (probably males) had apparently moved south to an area that was difficult to count from a boat by 26 July. We have chosen to substitute this count for our incomplete count of 26 July in order to give a best estimate of the otters in the area.

RESULTS AND DISCUSSION

The range of sea otters has changed relatively little since our first survey in 1977 (Jameson et al. 1982) (Table 1), although their distribution within this range does seem to have changed. Only one sea otter has been observed north of Cape Alava, and none have been sighted south of Destruction Island. The sighting north of Cape Alava in fall 1985 was of an adult male that was photographed at Neah Bay by John Calambokidis and confirmed by two of the authors (SJ and KWK); the otter had apparently left the area by spring 1986 (John Calambokidis, pers. comm.). There are three areas of concentration in this population: Cape Alava-Sand Point, Cape Johnson, and Destruction Island (Table 1). Prior to 1983, females with pups were sighted only at Destruction Island and near Cape Johnson, but in 1983 females with pups were observed at Ozette Island. In 1985, we recorded pups for the first time at Jagged Island, Sand Point, and Cape Alava, indicating that the reproductive segment of the population is expanding its range. The male group that has been located near Cape Alava since at least 1977 apparently has moved south. In other expanding populations, male groups have generally been responsible for range expansion by moving into unoccupied habitat to be followed later by females and pups (Estes, 1980, Mammalian Species, No. 133, 8 pp.; Garshelis et al. 1984, Can. J. Zool. 62:2648–2658).

South of La Push it appears that the small Destruction Island colony has failed to increase appreciably. Our first count, in 1977, yielded a total of six otters (Dave Nysewander saw nine in 1974) (Jameson et al. 1982). Seven were observed there in 1983, and eight were sighted in 1985 (Table 1). It appears that no colony has become established along the mainland coast south of La

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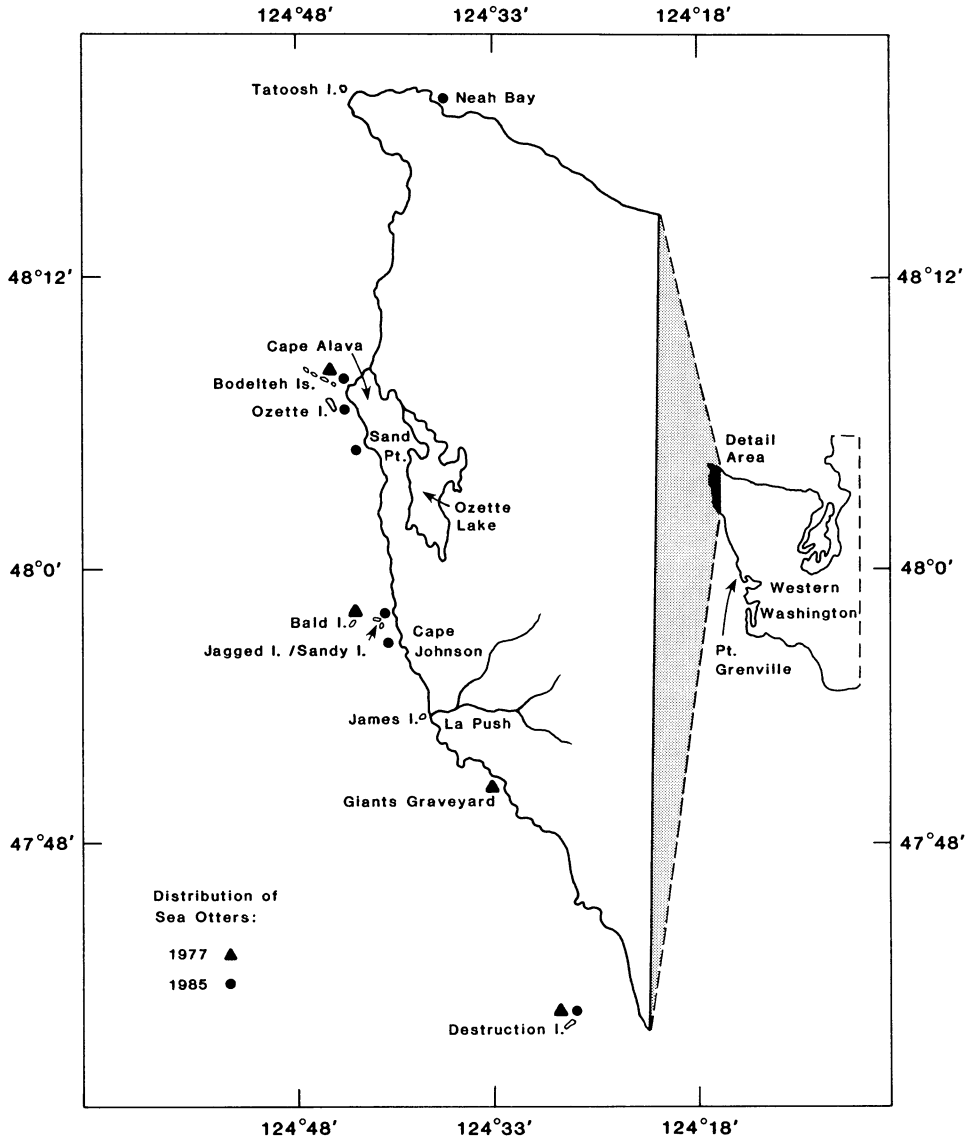

FIGURE 1. Distribution of sea otters along the outer coast of the Olympic Peninsula, Washington, 1977 and 1985.

Push, where we found three adults and one pup at Giants Graveyard in 1977 (Jameson et al. 1982) and we subsequently found no otters. North of La Push beds of giant and bull kelp (*Macrocystis integrifolia* and *Nereocystis lutkeana*) and shallow rocky substrata provide sheltered resting and feeding areas in all weather conditions.

The Cape Johnson area includes the Sandy Island and Jagged Island complex of offshore rocks and reefs. This is a particularly difficult area for observations because the many submerged and partially submerged rocks impede navigation and cause the water to be rough, making observations of sea otters from a boat difficult. Thus our 1985 count of 12 independent animals and one pup in this area is conservative (Table 1).

Based on our counts made from 1977–1985, the Washington population is growing at an average

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annual rate of 16.5%, which is comparable to growth rates of populations reoccupying historic habitat in Alaska (Kenyon 1969, North Amer. Fauna 68, 352 pp.). If the population continues to grow at this rate it will have more than doubled in size by 1990. It appears that the sea otter population in Washington may be established, and barring a human related disaster, such as an oil spill, should continue to grow and reoccupy vacant habitat.

In July 1985, we made SCUBA dives approximately 2 km south of Cape Johnson and near the south end of Ozette Island (two sites were surveyed at Ozette Island, one protected and one exposed to swell) to assess qualitatively the status of subtidal sea otter habitat in each area.

At Cape Johnson, sea urchins (*Strongylocentrotus franciscanus* and *S. purpuratus*) were locally common in crevices and small caves but rare on open substrata, and most would be accessible to foraging sea otters. Plant cover at the dive site included surfgrass (*Phyllospadix* sp.), kelp (*Laminaria* sp.), and various foliose red algae, of which *Cryptopleura farlowianum* appeared to be most abundant. A thin canopy of bull kelp was present. Substrata consisted of large boulders separated by areas of gravel and a few outcrops of solid rock. Most invertebrates and plants were restricted to boulders and rock outcrops.

We saw no sea urchins at Ozette Island, but crabs (*Pugettia* sp. and *Loxorhynchus* sp.) and turban snails (*Tegula* sp.) were common. Common plants include *M. integrifolia* (forming a thin surface canopy), *Laminaria* sp., *Pterygophora californica, Desmerestia ligulata,* and many species of foliose and corraline red algae. Substrata were similar to those of the Cape Johnson site.

The exposed site at Ozette Island was biologically similar to exposed sites within long-established portions of the sea otter range in California. Few exposed marine invertebrates were observed. *P. californica* and *Laminaria* sp. formed a dense understory, *Cryptopleura farlowianum* was the predominant turf alga, and there was a scattered canopy of bull kelp. The substratum was solid rock, with extensive crevice microhabitat.

Our observations suggest that benthic communities near Ozette Island are typical of areas influenced by the foraging of sea otters for many years. In contrast, the area south of Cape Johnson appears to be in transition from a system lacking sea otters to one in which sea otters are important predators.

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ANNUAL VARIATION IN THE HATCHING CHRONOLOGY OF CALIFORNIA QUAIL AT THE E. E. WILSON WILDLIFE AREA, OREGON

JOHN A. CRAWFORD

Hatching chronologies of California Quail (*Callipepla californica*) have been studied extensively throughout California (Sumner 1935, Genelly 1955, Savage 1974, Leopold 1977) where hatching times have been related to rainfall from late winter through summer (Raitt and Genelly 1964). Much less information has been available about hatching from other areas, although hatching dates

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