

AN ABSTRACT OF THE THESIS OF

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Title: THE ABUNDANCE AND DISTRIBUTION OF HARBOR

SEALS AND STELLAR SEA LIONS IN OREGON

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The abundance and distribution of the Pacific harbor seal (Phoca vitulina richardi) and the northern or Stellar sea lion (Eumetopias jubata) in Oregon are described. The number of seals and sea lions presented for bounty in Oregon since 1925 is presented.

Based on periodic surveys conducted between December, 1967 and June, 1968, numbers of harbor seals in Oregon were estimated to be not more than 500 in 1967-68 and most were found outside estuaries on offshore islands. However, a population of harbor seals in excess of 2,000 was once found in Oregon. Simpson Reef, Hunter's Island, Rogue River Reef, and Gull Rock were locations of the major concentrations of harbor seals in Oregon. The Columbia River, once attested to have the greatest number of seals in Oregon, now has no year-around resident seals, and the number of seals entering the river or remaining in the river for extended periods appears to be at an

all-time low.

Numbers of northern sea lions in Oregon were estimated to be about 1,000 in 1967-68. There were two breeding colonies or rookeries in Oregon, the largest on Orford Reef and the smaller at Sea Lion Caves. Other locations used by sea lions included the Rogue River Reef, Simpson Reef, Three Arch Rock, and Tillamook Head. Since Kenyon and Scheffer (1953) previously estimated the sea lion population of Oregon to be 1,000 animals in 1953, it was concluded that the population in Oregon was relatively stable. However, the current population was considerably smaller than 1925-27.

The Abundance and Distribution of Harbor
Seals and Stellar Sea Lions in Oregon

by

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THE ABUNDANCE AND DISTRIBUTION OF HARBOR SEALS AND STELLAR SEA LIONS IN OREGON

INTRODUCTION

The Pacific harbor seal (Phoca vitulina richardi) and the Stellar or northern sea lion (Eumetopias jubata) are prominent members of the fauna of Oregon. By reason of their reputation for destroying fishing gear and commercially valuable fish, they may be of some economic importance. Kenyon and Scheffer (1953) estimated the total number of Stellar sea lions along the Oregon coast to be 1,000 individuals. Bob Demory, in a 1965 report on harbor seals in Oregon written for the Columbia River Investigations of the Oregon Fish Commission (unpublished), stated that an estimate of the population of harbor seals was not available for the Oregon coast and estuaries.

The purpose of this study was to describe the abundance and distribution of the Pacific harbor seal and the northern sea lion in the waters of Oregon.

Harbor Seal

The Pacific harbor seal, also known as the common seal or spotted seal, is a native of the Pacific coast of North America from Mexico to the Bering Sea (Kenyon and Scheffer, 1953), and is found in three marine habitats. The first, described by Cowan and Guiguet

(1956), consists of bodies of water lying behind islands, points or reefs. The second and third, described by Spalding (1964), are river mouths with tidal sand bars, and the fresh water of rivers or lakes usually connected to the marine environment, respectively. In its marine habitat the harbor seal is sedentary with no definite migration although seasonal movement occurs in search of food (Fisher, 1952). Rarely does this movement exceed 5 miles from shore (Spalding, 1964).

In Oregon, from 1924 to 1933, bounties were paid on the harbor seal and sea lion. The records of these payments (Oregon Fish Commission, 1927; 1929; 1931; 1933; 1935) indicated that harbor seals were present in every major estuary from Brookings to Astoria. However, the major concentration apparently was in the Columbia River estuary where numbers of seals presented for bounty were consistently higher than from any other location in the state. Bob Demory in 1965 (unpublished) attested that the greatest number of seals in Oregon occurred in the lower Columbia River. The presence of seals at Alsea, Winchester, and Coos Bay was also noted by Demory.

In an Oregon State Game Commission "Resume of control activities and observations on harbor seals" for 1956 through 1965 (unpublished), Alsea, Winchester, and Tillamook Bays were listed as problem areas. At various times the Oregon State Game Commission had received complaints of "excessive numbers of seals and possible predation on fish" in these bays.

Columbia River

In 1933, the bounty on seals in Oregon was discontinued. In 1935, a new bounty system was implemented through legislation by which the Oregon Fish Commission "may use the seal fund in any manner it deems best for the purpose of hunting, killing, capturing or otherwise exterminating seals in the water of the Columbia River" (Oregon Fish Commission, Columbia River Seal Control Program Report 1967, unpublished). The numbers of bounties paid on seals from the Columbia River since the 1935 legislation are presented in Figure 1. The varying amount of bounty paid and the number of seals killed by the seal hunter hired by the Fish Commission are included.

During the summer of 1967, I spent three weeks on the Columbia River with the seal hunter, Mr. W. William Puustinen. As a result of this experience, and periodic surveys of the river from shore, I concluded that there were no year-around resident seals in the river. The number of seals seen in the Columbia River at various times during the year are presented in Table 1. From the great variability and inconsistency in numbers, I concluded that harbor seals enter the Columbia River at various times during the year for periods of a few days to 1 month but never remain in the river permanently.

The areas of geographical origin of the seals entering the Columbia River are unknown. The harbor seal in Oregon was found primarily on offshore islands outside the major estuaries (Table 2).

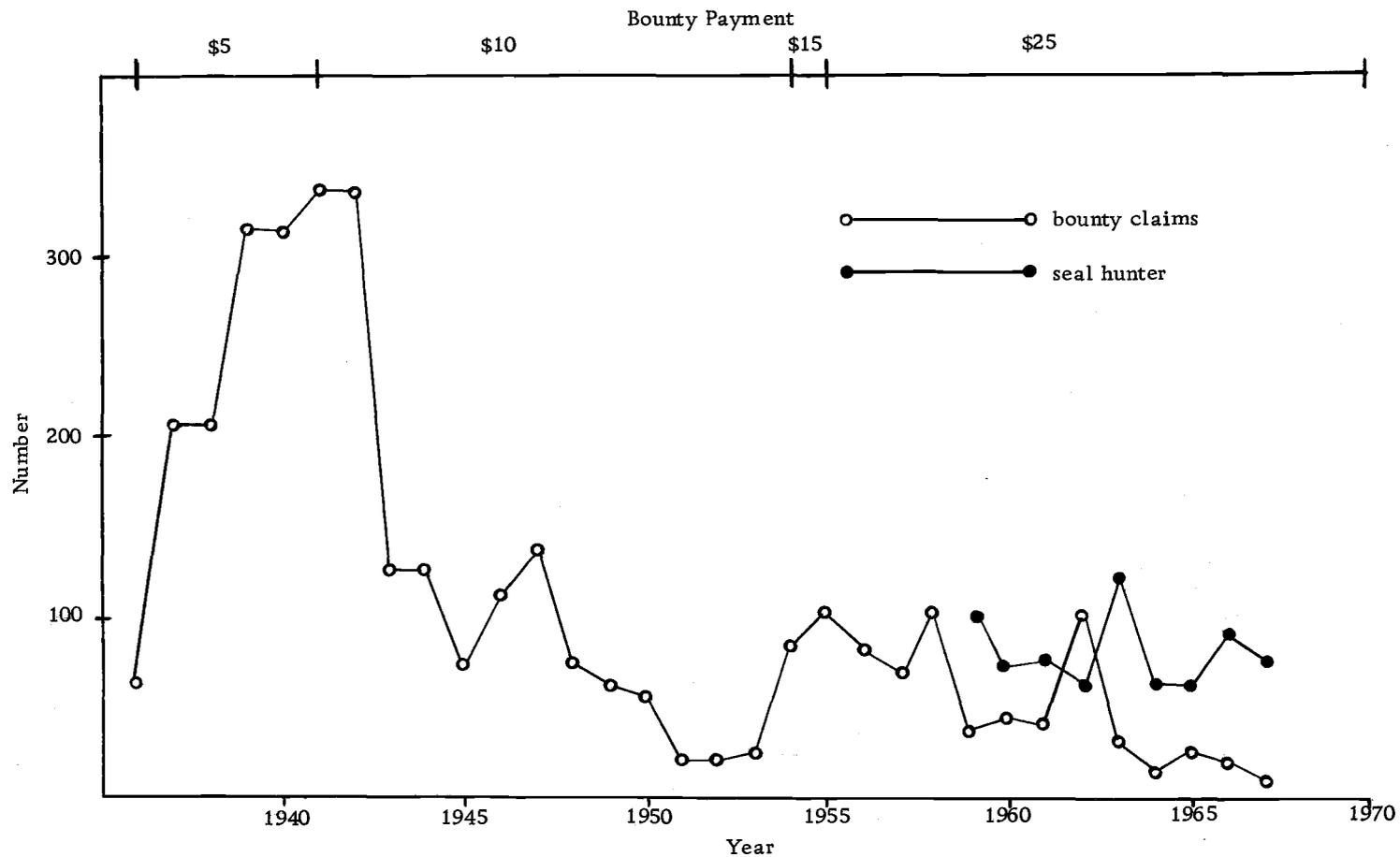


Figure 1. Seals killed on the Columbia River since the 1935 bounty legislation and seals killed by the contract seal hunter including possible kills. Data from Oregon Fish Commission, Columbia River Seal Control Program Reports, 1959-67 (unpublished).

Table 1. Harbor seals observed in the Columbia River between June, 1967, and May, 1968.

Date	Number of Seals Sighted
June 24, 1967	9
25	10
26	0
27	5
28	6
August 17, 1967	4
18	0
19	40
24	28
December 18, 1967	0
January 21, 1968	0
February 18, 1968	0
March 2, 1968	75
6	6
23	2
April 28, 1968	0
May 20, 1968	0

The offshore islands nearest the mouth of the Columbia River are found at Tillamook Head. The only other seemingly satisfactory habitat was at Willapa Bay, Washington. It appeared that seals entering the Columbia River were not residents of the immediate area because no seals were sighted north of Tillamook Head except in the Columbia River. Therefore, the seals probably moved into the river from the Tillamook Bay-Tillamook Head area or from Willapa Bay. Some indication of the movement of seals was evident in the northern half of Oregon where seal herds used haulouts irregularly. No movement was

Table 2. Location and numbers of seals and sea lions observed along the Oregon coast between December, 1967, and June, 1968.

Location	PERIOD OF THE YEAR									
	Dec. '67-Feb. '68		March '68		April '68		May '68		June '68 (aerial)	
	seals	sea lions	seals	sea lions	seals	sea lions	seals	sea lions	seals	sea lions
Hunter's Island					50		50		70	
Rogue River Reef and Hubbard Mound	40	12	70	150	12	50	60	100	50	125
Orford Reef and Blanco Reef									16	475
Coquille River	1									
Simpson Reef			100	25	117	62	150	100	100	10
Sunset Bay			10							
Coos Bay							35		35	
Sea Lion Caves		110		100		100		200		140
Seal Rock	3	27	4						1	
Gull Rock	1		15				12	10		
Netarts Bay	5									
Three Arch Rock		110		12						65
Tillamook Bay	10	2			30					
Tillamook Head						45		45		47
Columbia River			77							
Totals:	60	261	276	287	209	257	307	455	272	862

evident in the southern half of the state where seals consistently used the same haulouts (Table 2).

Despite an increasing rate of bounty payment, the number of seals presented for bounty on the Columbia River has decreased from a high of over 300 per year in 1941-42 to an all-time low of 14 in 1967 (Figure 1). Imler and Sarber (1947) stated that "roughly 40% of all seals shot in year-around hunting will sink." Therefore, I assumed that the number of seals presented for bounty represents only 60% of the seals actually killed. This would imply that the number of seals killed in the Columbia River ranged from over 500 in 1941-42 to a low of 23 in 1967.

In the Columbia River, harbor seals haulout primarily on Desdemona Sands, Taylor Sands, and Channel Sands (Figure 2). Other areas where seals were seen were Grays Bay, Green and Seal Island, the ship channel east of Miller Sands, and on various partially sunken logs in the lower river.

Coastal Survey

During the period December, 1967 - June, 1968, periodic surveys of the Oregon coast were conducted. These surveys involved checking all estuaries and offshore islands from shore for the presence of seals and/or sea lions. Binoculars were used to pinpoint the pinnipeds and then a spotting scope was used for making counts. Supplementary data on numbers and distribution were obtained during an aerial survey

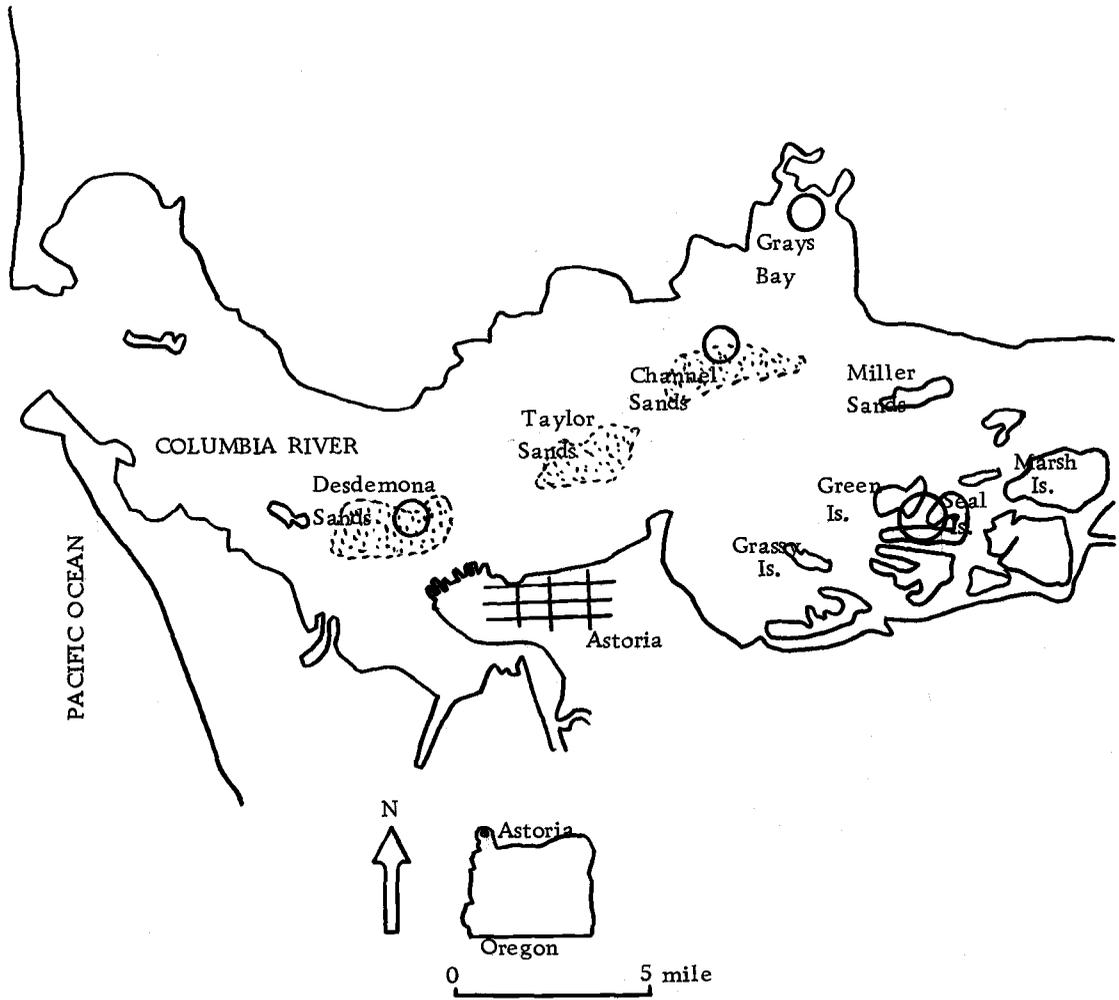


Figure 2. Mouth of the Columbia River showing the location of harbor seals. Haulouts used by seals are circled.

conducted in June, 1968. The aerial survey covered the offshore islands between Tillamook Head and Brookings, Oregon, but did not include the estuaries. The results of all surveys are presented in Table 2.

The largest concentration of harbor seals in Oregon was consistently seen at Simpson Reef, a group of rocky islets in Cape Arago State Park, just south of the mouth of Coos Bay (Figure 3). The average number of seals observed at this location was 117 (range 100-150). In March, 10 seals were seen in Sunset Bay just north of Simpson Reef, and a small herd of 35 seals was seen on a Coos Bay sand bar in both May and June. I concluded that there were probably about 200 seals in the Coos Bay area, and, because Simpson Reef is in a refuge maintained by the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service, this apparently was the only relatively unharrassed herd of seals in Oregon.

The second largest concentration of seals was found in the area of Gold Beach, Oregon. This concentration was made up of two herds using three haulout sites (Figure 4 and 5). The southern-most herd, consisting of about 60 seals, used a rocky shelf on the east side of Hunter's Island (Figure 4). The second herd, numbering about 55 seals, used two groups of haulouts depending on the tide. At low tide, seals were observed on a group of rocks in the Rogue River Reef, whereas, at high tide, islets further north at Hubbard Mound were

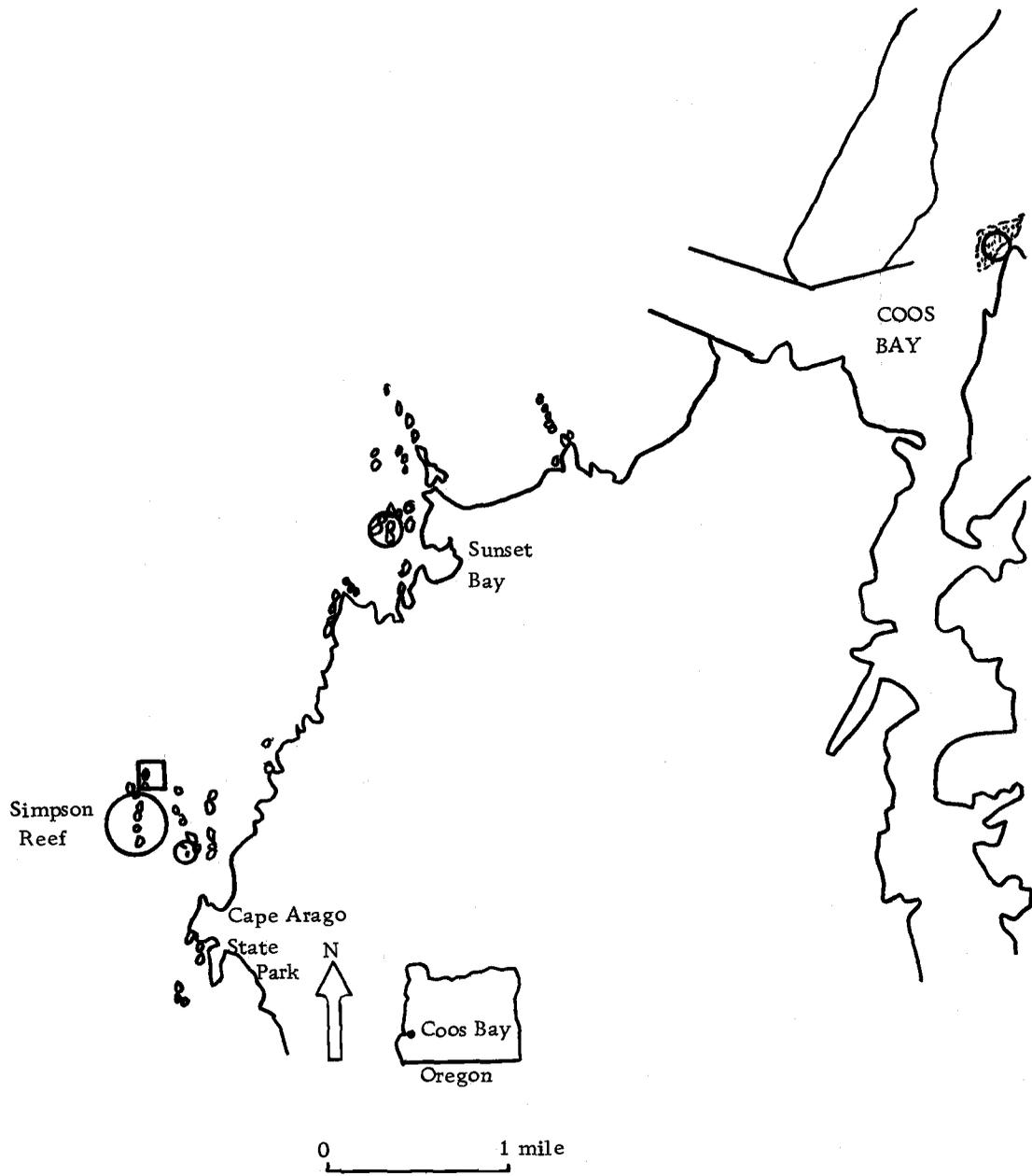


Figure 3. Coos Bay area with Simpson Reef showing the location of harbor seals and sea lions. Harbor seal haulouts are circled and sea lion haulouts are boxed.

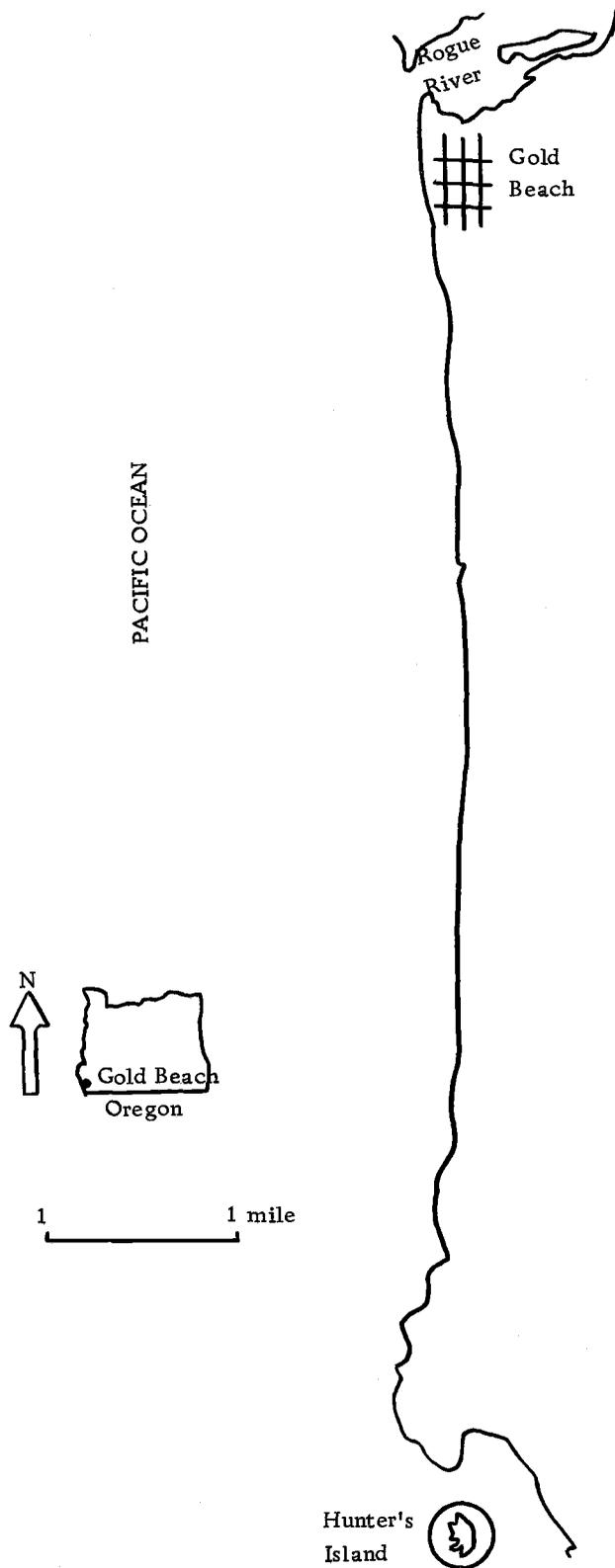


Figure 4. Gold Beach area showing the location of the harbor seal haulout (circled).

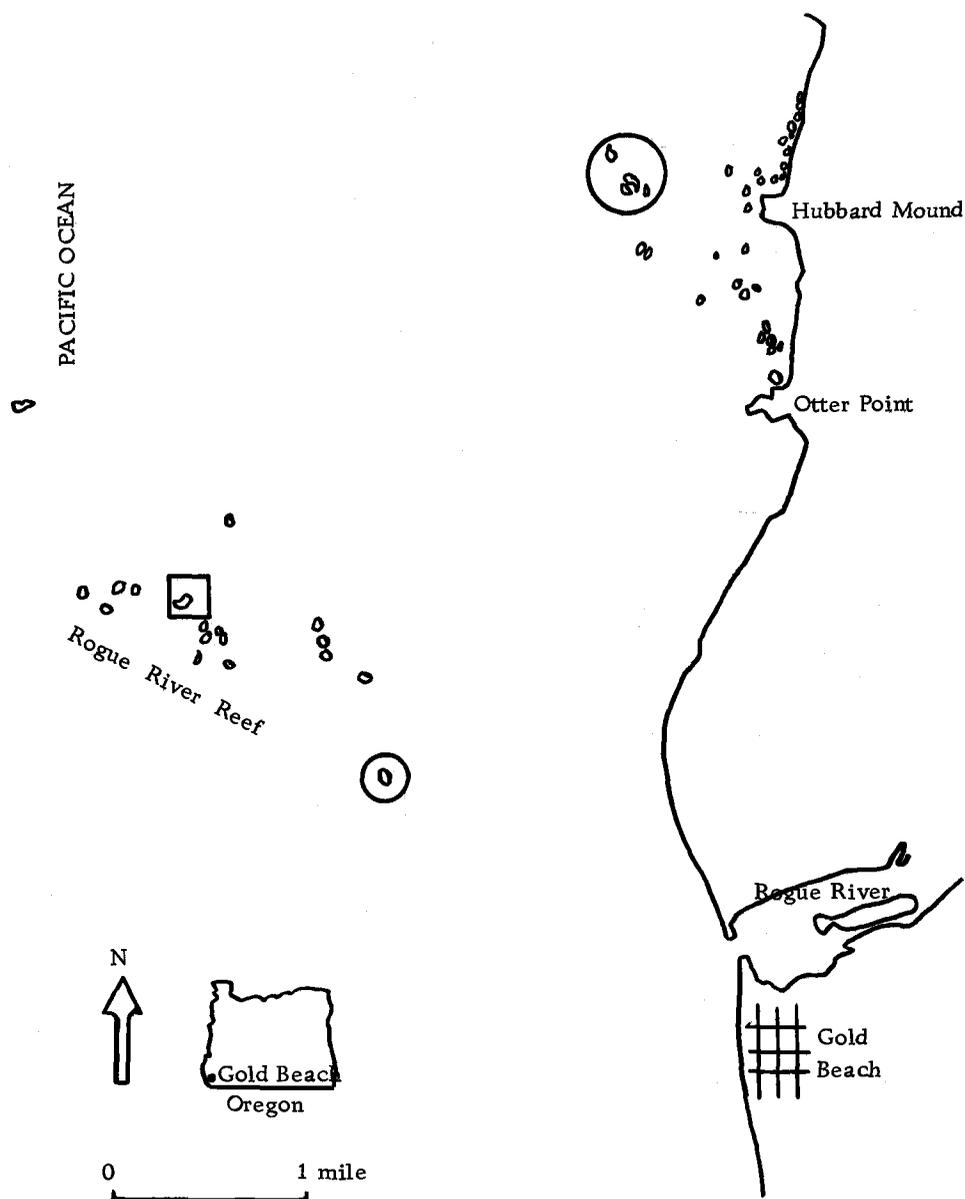


Figure 5. Gold Beach area showing the location of harbor seals and sea lions. Harbor seal haulouts are circled and sea lion haulouts are boxed.

used (Figure 5). The total population of seals in the Gold Beach area apparently did not exceed 125 individuals and probably fluctuated because the population was exposed to the harassment of fishermen in the area.

The third and last location of seals was in the area of Cape Foulweather on the east shelf of Gull Rock (Figure 6). This herd consisted of about 20 individuals, but was not observed using the same haulout as regularly as the herd in the Gold Beach and Simpson Reef areas. Three other areas of possible permanent residence were Seal Rock, Netarts Bay (Figure 7), and Tillamook Bay (Figure 8) where seals were observed irregularly but on more than one survey.

The average number of seals sighted on the March, April and May surveys was 245. Apparently in May and June, a partial cessation of feeding caused seals to spend more time hauled-out. Assuming that counts made at this time represent the majority of the population (at least 50%), the total number of harbor seals in Oregon could not be in excess of 500 individuals. This is far less than what was once present in Oregon. In 1930, there were 1,083 harbor seals presented for bounty in Oregon (Figure 9) implying an actual kill of 1,803 seals. This indicates that the population of seals numbered several times the number killed.

Although a tendency toward an increasing population of harbor seals in the spring was implied in the surveys, I felt that this was the

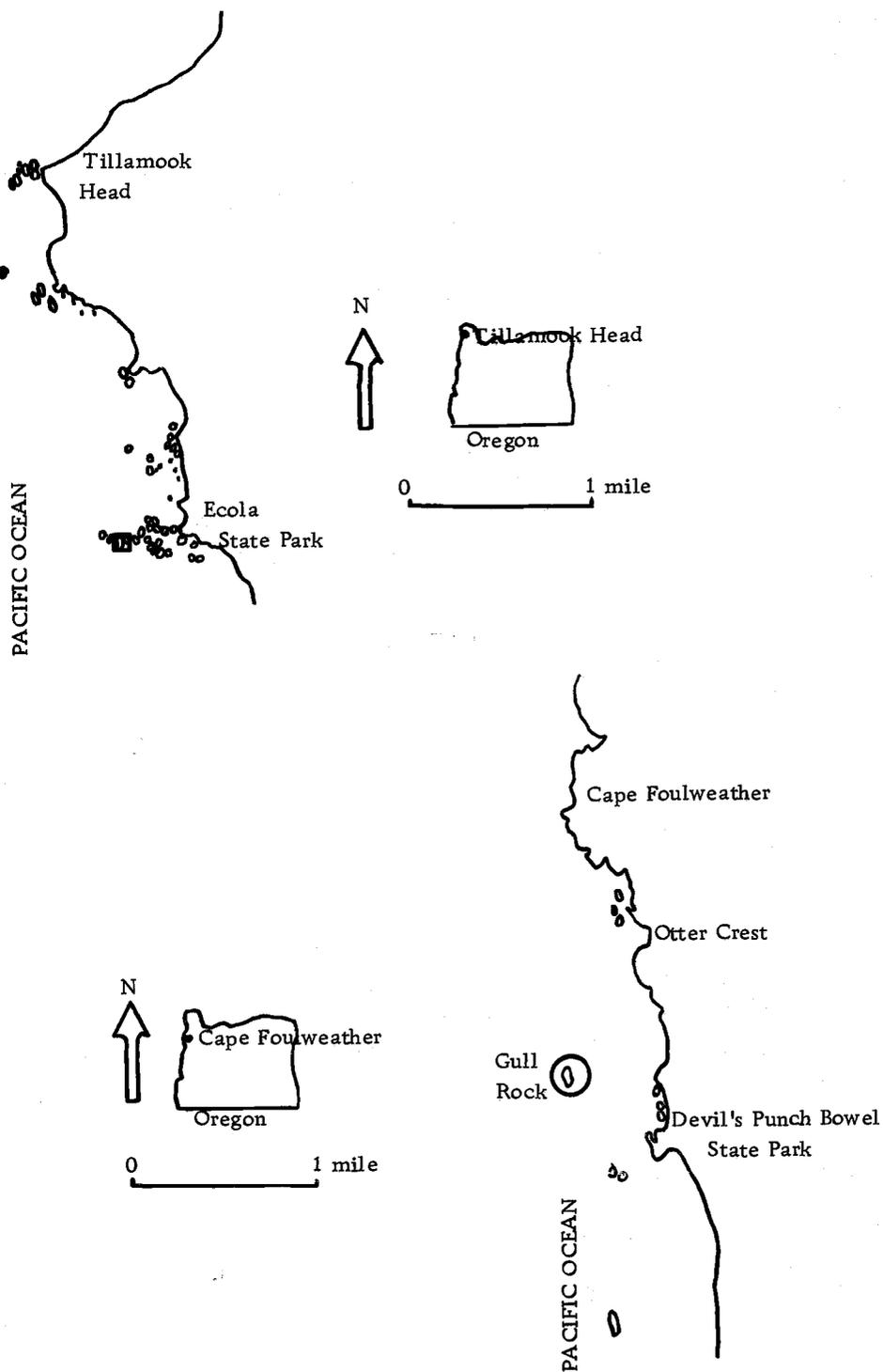


Figure 6. Tillamook Head and Gull Rock showing the location of harbor seals and sea lions. Harbor seal haulouts are circled and sea lion haulouts are boxed.

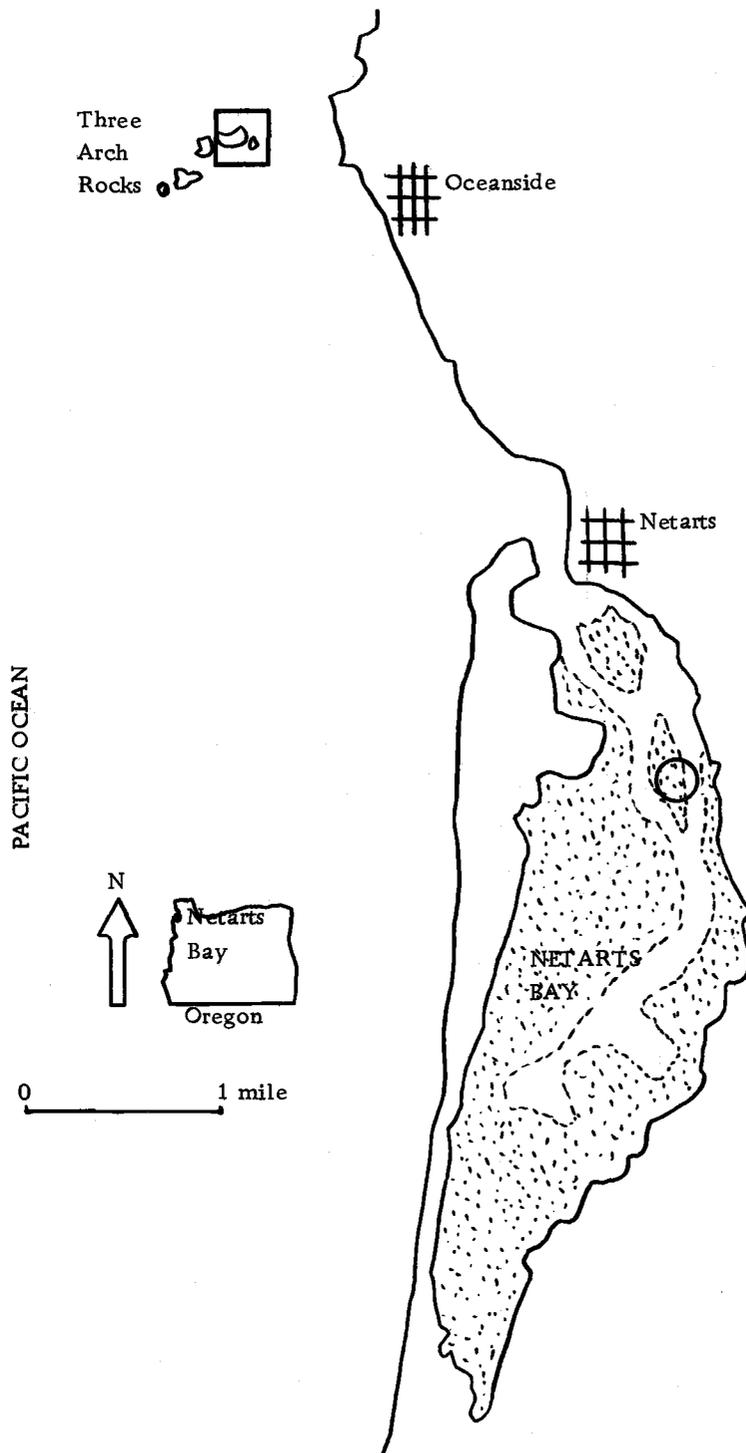


Figure 7. Netarts Bay and Three Arch Rocks showing the location of harbor seals and sea lions. Harbor seal haulouts are circled and sea lion haulouts are boxed.

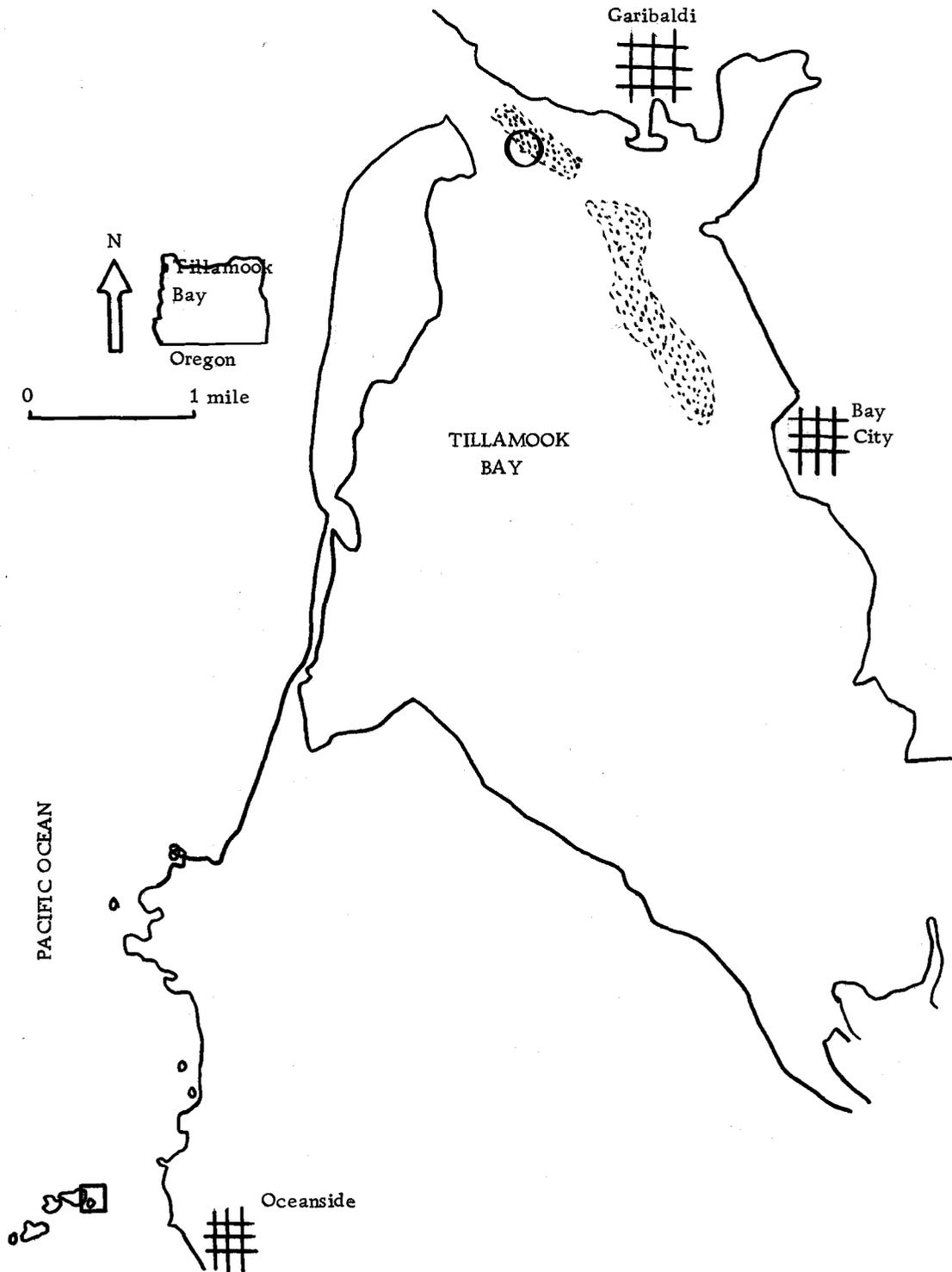


Figure 8. Tillamook Bay showing the location of harbor seals and sea lions. Harbor seal haulouts are circled and sea lion haulouts are boxed.

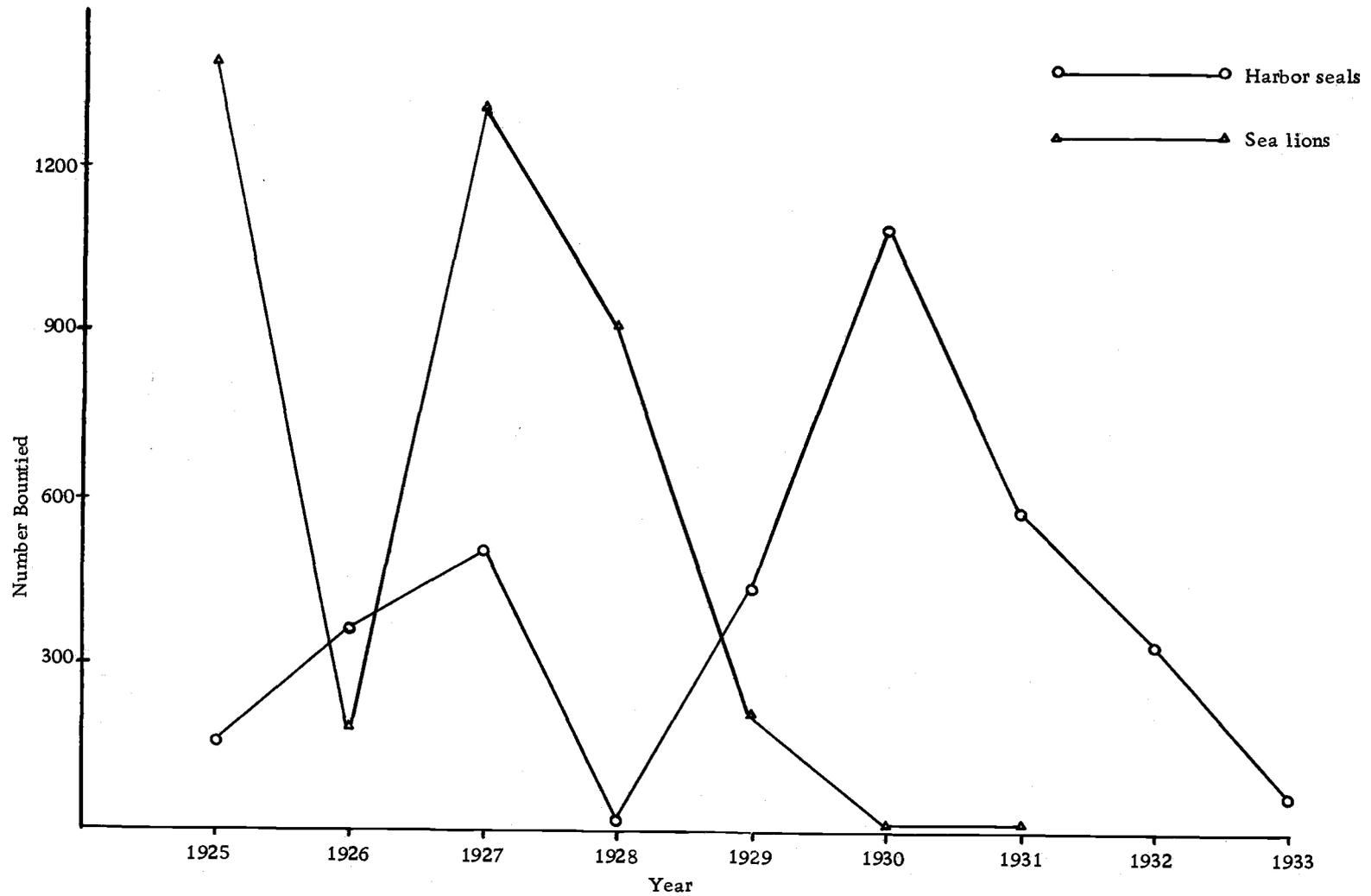


Figure 9. Numbers of harbor seals and sea lions presented for bounty, 1925-1933. For source of data see page 2.

result of a tendency toward gregariousness rather than an immigration. During the winter the seals apparently spent much of their time alone or in small groups making it more difficult to locate them, whereas, in the spring, they apparently congregated for the purpose of pupping and/or mating (Fisher, 1952). At this time, seals were more conspicuous. Reproduction was a factor in the increased total sightings for May, because new-born pups were sighted and included in the count. The June count was lower since this survey did not include any of the estuaries.

Although reported to be found principally in estuaries (King, 1964), the harbor seal in Oregon was found primarily outside the estuaries on offshore islands which were usually in close proximity with one of the major estuaries. Seals entered these estuaries for short periods but did not remain.

Stellar Sea Lions

The range of the Stellar or northern sea lion extends from the islands off southern California northward along the coast into the Bering Sea (Kenyon and Scheffer, 1953) where it lives mainly on rocky islands off the coast (King, 1964). Few adult male Stellar sea lions are seen on the California breeding grounds during winter indicating a northward movement in winter and a return in early summer. There is also a northward migration of California sea lions (Zalophus

californianus) in the winter (King 1964). Therefore the numbers presented here are in reference to the breeding population found in Oregon during the summer.

In Oregon, there are two breeding colonies or rookeries of Stellar sea lions. The largest of the two was found on the Orford Reef (Figure 10), a group of barren, rocky islands just south of Cape Blanco and north of Port Orford, Oregon. This breeding colony was not visible from shore and, therefore, was not counted until the June aerial survey. The population of sea lions in this colony, based upon counts made from aerial photographs, was 475, including pups. The stability of this colony was problematical because of the harassment received from Port Orford fishermen. Between 1925 and 1928, there were 2,108 sea lions presented for bounty in the area surrounding Port Orford from Gold Beach to North Bend, Oregon. In 1925, there were 333 sea lions presented for bounty in Port Orford and in 1928 there were 913 sea lions presented for bounty in Gold Beach.

Another smaller breeding colony was found at Sea Lion Caves where counts varied from 100 to 200 animals, but averaged 130. This rookery was found on a rocky ledge on shore at the base of cliffs and at the mouth of a cave which is used for cover during winter storms. This herd was not harassed by fishermen because the caves are a major tourist attraction.

A number of other islands along the Oregon coast were used by

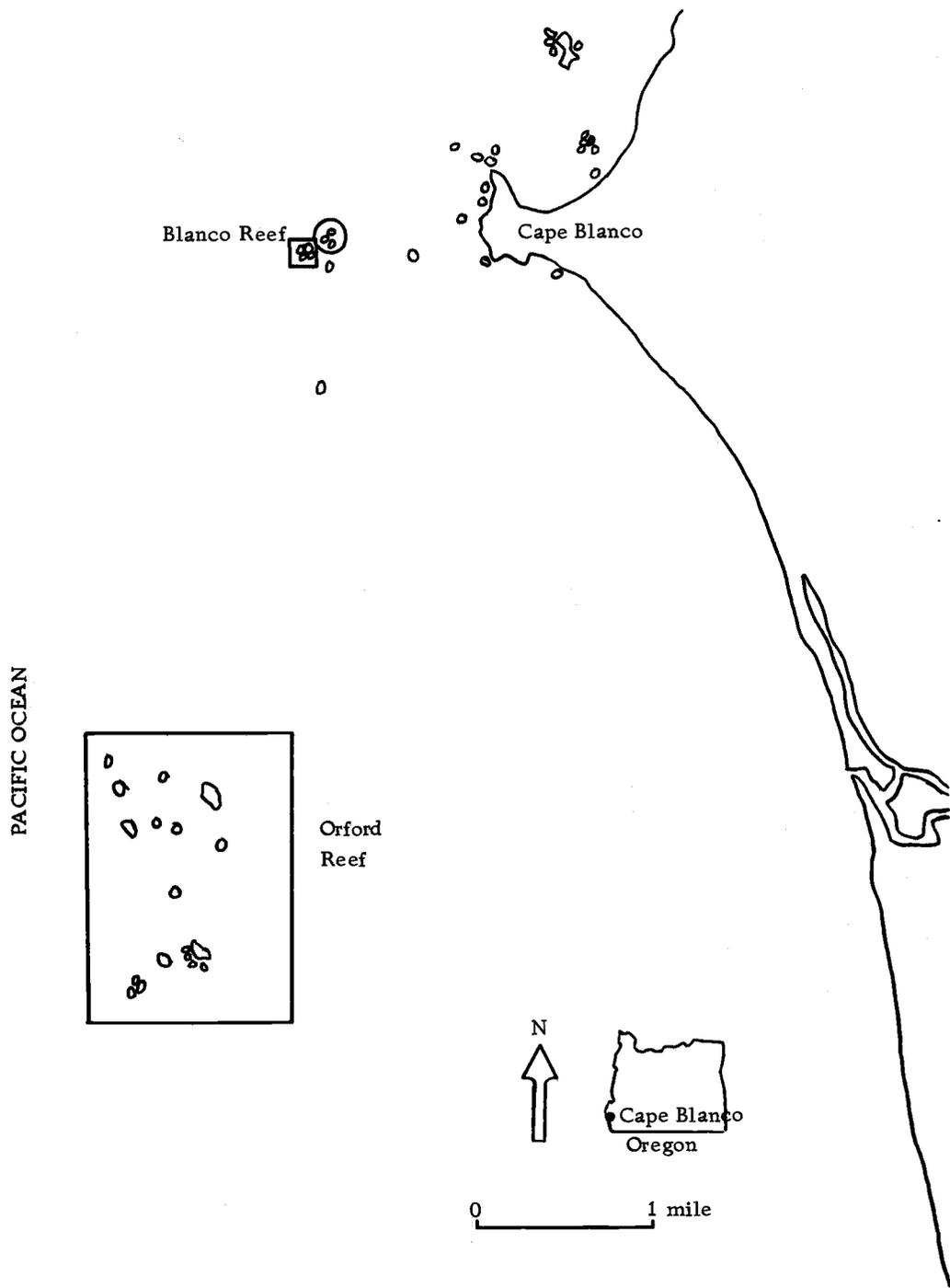


Figure 10. Cape Blanco area showing the location of harbor seals and sea lions. Harbor seal haulouts are circled and sea lion haulouts are boxed.

sea lions as haulouts but none of these were observed to be rookeries (Table 2). The Rogue River Reef (Figure 5) was used by 12 to 150 sea lions depending on height of the tide. In 1928, there were 913 sea lions killed in this locality. At that time, the Rogue River Reef may have been a large rookery which was greatly reduced subsequently by efforts of control concentrated in the one area (Pike and Maxwell, 1958).

Sea lions were also observed at Simpson Reef (Figure 3) in numbers varying from 10 to 100. Between 10 and 110 sea lions were seen at Three Arch Rock (Figure 7) at Oceanside, Oregon, and at Tillamook Head about 45 sea lions were regularly observed on the south ledge of the largest of a group of islands and associated rocks (Figure 6).

Sea lions occasionally enter rivers. In February 1968, two sea lions were seen in Tillamook Bay and reports of sea lions in the Columbia River were not uncommon.

Pike and Maxwell (1958) stated that few sea lions were found at sea or far removed from rookery sites during the breeding season. Counts made at this time were estimated to represent 80% or more of the entire population. Assuming that the count of 862 sea lions in June represented 80% of the population, the total sea lion population for Oregon in 1968 was 1,078. This was nearly equal to the estimate of Kenyon and Scheffer in 1953. Apparently, the population of Stellar

sea lions has not changed significantly in the last 15 years. However, because 1,387 sea lions were presented for bounty in Oregon in 1925, the total population of sea lions in Oregon at one time probably numbered several times the present estimated population.

The Pacific harbor seal and northern sea lion are an interesting and valuable part of the native fauna of Oregon from an aesthetic point of view. Therefore, because the number of these animals (harbor seals in particular) is declining and the major concentration of pinnipeds was found outside the estuaries where control should be unnecessary, some degree of protection should be provided to ensure the perpetration of these valued members of our fauna.

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