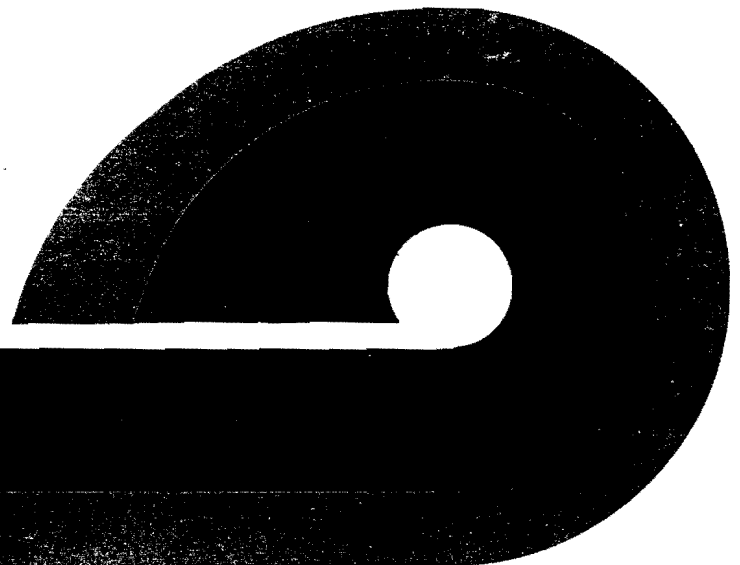


FISH COMMISSION OF OREGON



# TILLAMOOK BAY ESTUARY

A STUDY IN RESOURCE USE  
DIVISION OF MANAGEMENT AND RESEARCH



# 1971 TILLAMOOK BAY RESOURCE USE STUDY

by  
**Tom Gaumer**  
**Darrell Demory**  
**Laimons Osis**

Fish Commission of Oregon  
Division of Management and Research

Funded by  
State of Oregon  
General Fund

U.S. Army Corps of Engineers  
Contract No. DACW 57-72-C-0138

National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
PL 88-309 Contract Nos. N208-0073-72(N) and NO4-3-208-55

August 1973

## TABLE OF CONTENTS

|   | Page No. |
|---|----------|
| INTRODUCTION .....  | 7        |
| PROCEDURE .....   | 7        |
| RESULTS .....   | 8        |
| Boat Fishery .....  | 8        |
| Shore Fishery .....   | 8        |
| Tideflat Fishery .....  | 8        |
| Scuba Fishery .....   | 9        |
| Angler Origin .....   | 9        |
| Combined Recreational Fisheries .....   | 9        |
| Commercial Fishery .....  | 10       |
| Eel Grass Beds .....  | 10       |
| Commercial Oyster Leases and Potential Oyster<br>Growing Areas .....  | 10       |
| Food Production Areas, Fish Feeding Areas, Fish Migration<br>Routes, and Known Herring Spawning Areas ..... | 10       |
| ACKNOWLEDGMENTS .....   | 11       |

## LIST OF FIGURES

| Figure No. |   | Page No. |
|------------|---|----------|
| 1          | Location of Tillamook Bay Estuary .....   | 6        |
| 2          | 1971 FCO Resource Survey Sampling Areas .....   | 23       |
| 3          | Principal Boat Fishing Areas .....  | 24       |
| 4          | Clam Beds .....   | 25       |
| 5          | Eel Grass Beds .....  | 26       |
| 6          | Commercial Oyster Leases and Potential Oyster<br>Growing Areas .....  | 27       |
| 7          | Food Production Areas, Fish Feeding Areas, Fish Migration<br>Routes, and Known Herring Spawning Areas ..... | 28       |

## LIST OF TABLES

| Table No. |   | Page No. |
|-----------|---|----------|
| 1         | Location of Sampling Stations, Tillamook Bay, 1971 .....  | 12       |
| 2         | Number of Boat Angler Trips by Month and Area, Tillamook Bay,<br>March 1 through October 31, 1971 .....                                     | 12       |
| 3         | Hours of Boat Angler Use by Month and Area, Tillamook Bay, March 1<br>through October 31, 1971 .....  | 13       |
| 4         | Marine Animals Caught by Boat Anglers, Tillamook Bay, by Species<br>and Area, March 1 through October 31, 1971 .....                        | 13       |
| 5         | Sport Boat Fishing Data, Tillamook Bay, All Areas, 1971 .....   | 14       |
| 6         | Number of Shore Angler Trips by Month and Area, Tillamook Bay,<br>March 1 through October 31, 1971 .....                                    | 15       |
| 7         | Hours of Shore Angler Use by Month and Area, Tillamook Bay, March 1<br>through October 31, 1971 .....                                       | 15       |
| 8         | Marine Animals Caught by Shore Anglers, Tillamook Bay, by Species<br>and Area, March 1 through October 31, 1971 .....                       | 16       |
| 9         | Shore Fishing Data, Tillamook Bay, All Areas, 1971 .....  | 17       |
| 10        | Number of Tideflat User Trips by Month and Area, Tillamook Bay,<br>March 1 through October 31, 1971 .....                                   | 18       |
| 11        | Hours of Tideflat Use by Month and Area, Tillamook Bay, March 1<br>through October 31, 1971 .....   | 18       |
| 12        | Marine Animals Caught by Tideflat Users, Tillamook Bay, by Species<br>and Area, March 1 through October 31, 1971 .....                      | 19       |
| 13        | Summary of Numbers of Angler Trips, Hours of Effort, and Animals<br>Caught, Tillamook Bay, by Station, March 1 through October 31, 1971 ... | 20       |
| 14        | Summary of Numbers of Angler Trips, Hours of Effort, and Animals<br>Caught, Tillamook Bay, by Month, March 1 through October 31, 1971 ....  | 21       |
| 15        | Taxonomic List of Species Harvested by Estuarine Resource Users,<br>Tillamook Bay, March 1 through October 31, 1971 .....                   | 22       |

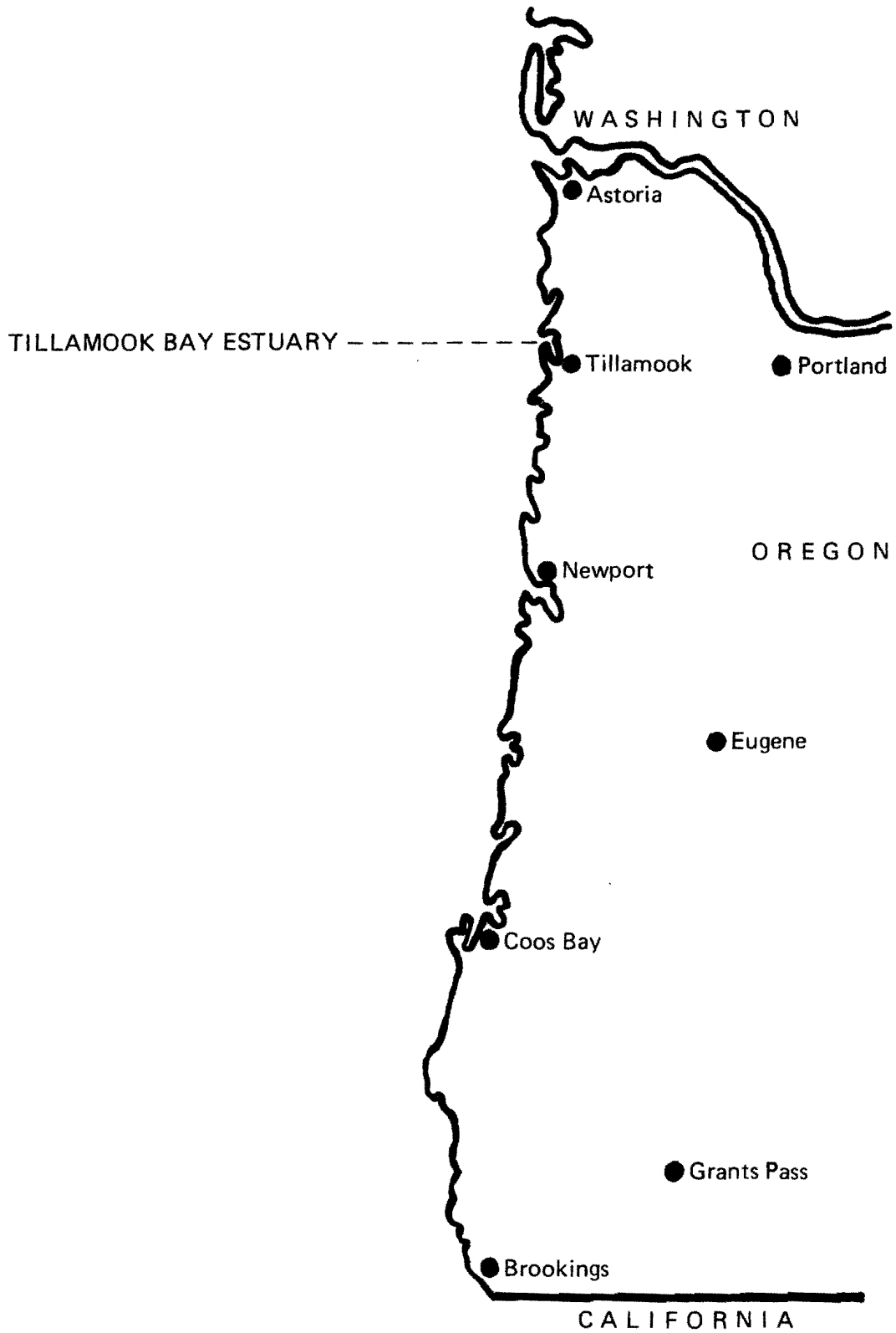


Figure 1. Location of Tillamook Bay Estuary.

# 1971 TILLAMOOK BAY RESOURCE USE STUDY

## INTRODUCTION

In 1971 the Fish Commission of Oregon conducted a comprehensive study of the recreational use of marine food fish, shellfish, and other miscellaneous invertebrates in 16 Oregon estuaries. The anadromous sport fisheries in the upper portions of most estuaries were not included in the study due to the lack of manpower to adequately sample those areas. The study was supported by state general funds and by the National Marine Fisheries Service under the Commercial Fisheries Research and Development Act. The U.S. Army Corps of Engineers funded portions of the data processing, preparation of a series of marine resource maps, and a special report for each estuary. This report summarizes the results of the Tillamook Bay study.

## PROCEDURE

Tillamook Bay is located 61 miles south of the Columbia River (Figure 1). The 8,839 acre bay is the third largest estuary in Oregon and contains 4,163 acres of tidelands.

From March 1 through October 31, 1971, boat and shore anglers, tideflat users, and scuba divers were interviewed for catch, effort, and origin data in a program designed for statistical analysis. Resource users were categorized as: (1) county, those people that reside within the county where the sampled estuary is found, but west of the coast range summit; (2) state, those people who are residents of Oregon, but are not classified as county; and (3) non-state, those people that are not residents of Oregon.

The study area extended from the seaward ends of the two jetties upstream 10 miles to the Tillamook-Netarts highway bridge over the Trask River. The south jetty was not included in the shore sample due to limited access to anglers and samplers. Survey areas and their station numbers are outlined in Table 1 and are shown in Figure 2.

The 1971 Tillamook Bay commercial landings of fish and shellfish and their value, taken from Fish Commission catch statistic reports, are included in the results as supplemental information.

The following maps were prepared using information collected in previous Fish Commission studies and the 1971 resource use survey.

1. Principal boat fishing areas.
2. Clam beds.
3. Eel grass beds.
4. Commercial oyster leases and potential oyster growing areas.
5. Food production areas, fish feeding areas, fish migration routes, and known herring spawning areas.

## RESULTS

During the study 15,700 boat, shore, tideflat, and scuba resource user interviews were obtained to estimate catch and effort values and angler origin. The values presented in the tables are estimates and have been rounded off when used in the text.

### Boat Fishery

Figure 3 shows the principal boat fishing areas of Tillamook Bay. Both sport and commercial boat fishing areas are combined on the map. Principal species of fish and shellfish caught and peak periods of fishing activity are outlined.

An estimated 24,500 boat angler trips were expended on Tillamook Bay (Table 2). These boat anglers spent 98,500 hours fishing (Table 3). The peak month of activity was September.

Nineteen species of fish, two species of crabs, and one species of other invertebrates were identified in the boat anglers' catch (Table 4). Dungeness crab and chinook salmon were the principal species taken and accounted for 96% of the total number of animals caught. The major catches occurred during the months of July through September (Table 5). Fishing success (catch per hour) was highest during March.

### Shore Fishery

Interview data revealed that 17,500 shore angler trips were expended on Tillamook Bay (Table 6). The north jetty was the principal fishing area; 52% of the anglers fished there. Shore anglers spent 35,600 hours fishing (Table 7). The peak months of activity were July and August.

Twenty-five species of fish and two species of crabs were identified in the shore anglers' catch (Table 8). Pile perch and kelp greenling were the principal species taken, accounting for 39% of the total number of animals caught. The peak catch occurred during the month of May (Table 9). Fishing success was highest during May which can be attributed to an increase of pile perch in the bay.

### Tideflat Fishery

Figure 4 shows the distribution of bay clams in Tillamook Bay. Several species of clams including cockle, native littleneck, butter, and gaper clams are found in the intertidal and subtidal zones of the bay below Bay City. Softshell clams are found scattered throughout the upper portions of the bay. Principal areas of digging are outlined on the map in Figure 4.

Table 10 shows that 24,500 tideflat user trips were expended to harvest clams, miscellaneous invertebrates, and fishes from Tillamook Bay. Of this total, 23,900 or 98% were clam digger trips. Tideflat users spent 38,300 hours collecting marine animals (Table 11). The peak month of activity was July. The major digging effort (53%) was expended in the Garibaldi Flat area where 13,000 tideflat users spent 20,400 hours collecting tideflat animals. Garibaldi Flat supported the heaviest tideflat use of any of Oregon's tideflats.



Ten species of clams and 11 species of miscellaneous invertebrates, fish, and algae were harvested by tideflat users (Table 12). Cockle, native littleneck, butter, and gaper (called blue-neck in Tillamook Bay) clams were the principal species collected, accounting for 98% of the total number of clams dug. Garibaldi Flat was the principal area of catch providing 398,700 animals or 61% of the harvest. Of this total, 390,500 or 98% were clams. Garibaldi Flat provided the largest harvest of clams of any of Oregon's tideflats.

### Scuba Fishery

The small number of scuba divers interviewed on Tillamook Bay precluded making an estimate of catch and effort for this fishery.

### Angler Origin

Nearly three-fourths (73%) of the anglers interviewed were residents of Oregon living outside of Tillamook County as shown below. About 21% of the resource users were Tillamook County residents and 6% were nonresidents.

|            | Angler Origin |        |           |
|------------|---------------|--------|-----------|
|            | County        | State  | Non-State |
| Boat       | 4,977         | 18,146 | 1,359     |
| Shore      | 3,704         | 12,773 | 1,048     |
| Tideflat   | 5,044         | 17,823 | 1,605     |
| Total      | 13,725        | 48,742 | 4,012     |
| Percentage | 20.6          | 73.3   | 6.0       |

This is a high proportion of state residents and reflects the heavy usage of Portland residents on this estuary.

### Combined Recreational Fisheries

Analysis of Tillamook Bay data revealed that 66,500 resource user trips (24,500 boat, 17,500 shore, and 24,500 tideflat) were expended in the estuary during the study (Table 13). Approximately 73% of the resource users for the three fisheries were state residents living outside of Tillamook County. The 66,500 user trips represent 172,300 hours of effort (98,500 boat, 35,600 shore, and 38,200 tideflat). The peak month of activity was September for the boat fishery, and July for the shore and tideflat fishery (Table 14). Combining all fisheries, Table 14 shows that July was the peak month of activity. Areas receiving the principal use for boat, shore, and tideflat fishery were below Tillamook-Netarts Highway (100%), North Jetty (52%), and Garibaldi Flat (53%), respectively.

Anglers of the three fisheries harvested 703,400 marine animals (20,400 fish, 32,800 crabs, 613,800 clams, and 36,400 miscellaneous invertebrates). Crabs comprised 93% of the boat anglers' total catch. Dungeness crab was the principal species caught. Fish were the principal marine animals harvested by shore anglers and represented 98% of the total take. Pile perch was the principal species caught followed by kelp greenling and shiner perch. Clams comprised 94% of the tideflat users' total take. Cockle and littleneck clams were the principal species dug making up 39 and 38% of the harvest, respectively. Mud shrimp was the principal species of miscellaneous invertebrates collected by the tideflat

users. Comparing the catch for all three fisheries revealed that tideflat users harvested 650,600 or 92% of the total animals taken. Boat and shore anglers caught 35,000 and 18,000 marine animals, respectively. Peak month of catch was September for the boat fishery, May for the shore fishery, and July for the tideflat fishery. Combining all fisheries, July was the principal month of catch.

### Commercial Fishery

Commercial landings of marine food fish and shellfish caught in Tillamook Bay in 1971 totaled 343,130 pounds valued at \$300,009 (fisherman's level) according to Fish Commission landing statistics, listed below. Oyster was the principal species harvested.

| Species              | Pounds  | Value     |
|----------------------|---------|-----------|
| Oysters              | 239,136 | \$270,000 |
| Dungeness crab       | 92,465  | 23,116    |
| Pacific herring      | 4,893   | 4,893     |
| Bay clams            | 5,948   | 1,000     |
| Ghost and mud shrimp | 688     | 1,000     |
| Total                | 343,130 | \$300,009 |

### Eel Grass Beds

Eel grass beds are found scattered throughout Tillamook Bay (Figure 5). These beds are usually found in areas of shallow water and high salinities. Clams and other important marine fauna are usually an integral part of the eel grass beds.

### Commercial Oyster Leases and Potential Oyster Growing Areas

More than 80% of the oysters grown in Oregon come from Tillamook Bay. Figure 6 shows the commercial oyster leases, totaling 2,285 acres. An estimated 3,300 acres of Tillamook Bay are considered suitable for oyster culture.

### Food Production Areas, Fish Feeding Areas, Fish Migration Routes, and Known Herring Spawning Areas

Figure 7 shows the food production areas, fish feeding areas, and fish migration routes in Tillamook Bay. Also outlined on the map are the known herring spawning areas.

Estuaries are some of the most productive lands on earth. The productivity of estuarial areas is directly related to length of shore line, depth of water, and geographical location. Within each estuary, tidelands are generally more productive than deep water channel areas.

In Tillamook Bay, the production of food organisms occurs throughout the entire estuary. These food organisms include the microscopic phytoplankton and other algae, zooplankton, small crustaceans, mollusks, annelids, and fish which are all important in the estuarine food chain.

The fish feeding areas of Tillamook Bay (for finfish and shellfish) include all areas of the estuary under tidal influence. Tideflats as well as deep water channels and rocky areas provide a variety of rearing habitat. Species of fish, numbers, and distribution within each area are generally related to type of food organisms, bottom type, water depth, and water quality.

Forty-five species of fish have been identified in Tillamook Bay (Richard Berry, personal communication). A taxonomic list of the species of marine animals observed in this study is contained in Table 15.

Fish and shellfish typically found associated with tideflats include flounder, sole, perch, rockfish, salmon, crabs, shrimp, and clams. In addition to those species found on tideflats, herring, anchovy, and smelt reside in the estuary channels; period of residency is dependent on species, season, and location.

Rocky areas in Tillamook Bay are the preferred feeding and rearing areas of perch, rockfish, greenling, and cabezon. These fish reside near the jetties and rock groins of the lower bay.

Fish migration routes are those areas traveled by fish to and from spawning, feeding, or rearing areas. Fish migration routes through Tillamook Bay are as varied as the fish that use them. Species and age class of fish, season, water depth, and water quality all play an important role in fish migration patterns.

The use of channel areas throughout the estuary by salmon, trout, perch, flounder, and baitfish is well known. In addition, during high tide, these same fish frequently swim across tideflats to reach their destination.

From January through March, herring eggs can be found adhered to pilings, rocks, or eel grass in those areas outlined in Figure 7. More complete observations in the future will no doubt reveal other areas used by these fish.

#### **ACKNOWLEDGMENTS**

The Fish Commission of Oregon personnel who contributed in the gathering, compiling, analyzing of data, typing, and editing of this report are too numerous to mention by name. However, special thanks are due Mrs. Linda Karlik for the work she did on the resource maps and Mr. Louis Fredd for his assistance in analyzing the data.

**Table 1. LOCATION OF SAMPLING STATIONS  
Tillamook Bay, 1971**

| Fishing Activity | Station Number | Location   |
|------------------|----------------|--|
| Boat             | B-1            | Head of tide downstream to westward end of jetties |
| Shore            | S-1            | North Jetty  |
|                  | S-2            | Barview  |
|                  | S-3            | Garibaldi Moorage                                  |
|                  | S-4            | Hobsonville Point and culvert area                 |
|                  | S-5            | Trask River Bridge                                 |
|                  | S-6            | County Boat Ramp - Bay Ocean Spit                  |
| Tideflat         | T-1            | Garibaldi Flat                                     |
|                  | T-2            | Hobsonville Point                                  |
|                  | T-3            | County Ramp (softshell area)                       |
|                  | T-4            | Bay Ocean  |

**Table 2. NUMBER OF BOAT ANGLER TRIPS  
By Month and Area, Tillamook Bay  
March 1 through October 31, 1971**

| Month      | <u>Boat Fishing Area and Station Number</u> |        | Total  | Percentage |
|------------|---|--------|--------|------------|
|            | Below Tillamook-Netarts Highway             | B-1    |        |            |
| March      |   | 669    | 669    | 2.7        |
| April      |   | 1,162  | 1,162  | 4.7        |
| May        |   | 1,874  | 1,874  | 7.7        |
| June       |   | 1,411  | 1,411  | 5.8        |
| July       |   | 2,045  | 2,045  | 8.4        |
| August     |   | 3,383  | 3,383  | 13.8       |
| September  |   | 7,245  | 7,245  | 29.6       |
| October    |   | 6,693  | 6,693  | 27.3       |
| Total      |   | 24,482 | 24,482 | 100.0      |
| Percentage |   | 100.0  | 100.0  |            |

**Table 3. HOURS OF BOAT ANGLER USE  
By Month and Area, Tillamook Bay  
March 1 through October 31, 1971**

| Month      | Boat Fishing Area and Station Number<br>Below Tillamook-Netarts Highway |        | Percentage |
|------------|---|--------|------------|
|            | B-1   | Total  |            |
| March      | 2,243   | 2,243  | 2.3        |
| April      | 3,973   | 3,973  | 4.0        |
| May        | 7,045   | 7,045  | 7.2        |
| June       | 4,795   | 4,795  | 4.9        |
| July       | 6,393   | 6,393  | 6.5        |
| August     | 11,740  | 11,740 | 11.9       |
| September  | 31,267  | 31,267 | 31.7       |
| October    | 31,020  | 31,020 | 31.5       |
| Total      | 98,476  | 98,476 | 100.0      |
| Percentage | 100.0   | 100.0  |            |

**Table 4. MARINE ANIMALS CAUGHT BY BOAT ANGLERS  
Tillamook Bay, by Species and Area  
March 1 through October 31, 1971**

| Species                  | Boat Fishing Area and Station Number<br>Below Tillamook-Netarts Highway |        | Percentage |
|--------------------------|---|--------|------------|
|                          | B-1   | Total  |            |
| Dungeness crab           | 32,263  | 32,263 | 92.3       |
| Red rock crab            | 59  | 59     | 0.2        |
| Chinook salmon (adult)   | 1,364   | 1,364  | 3.9        |
| Coho salmon (adult)      | 439   | 439    | 1.3        |
| Redtail surfperch        | 166   | 166    | 0.5        |
| Kelp greenling           | 158   | 158    | 0.5        |
| Pacific herring          | 144   | 144    | 0.4        |
| Striped seaperch         | 72  | 72     | 0.2        |
| Pile perch               | 63  | 63     | 0.2        |
| Northern anchovy         | 52  | 52     | 0.1        |
| Surf smelt               | 43  | 43     | 0.1        |
| Black rockfish           | 30  | 30     | 0.1        |
| Shiner perch             | 26  | 26     | 0.1        |
| Starry flounder          | 20  | 20     | <0.1       |
| Buffalo sculpin          | 11  | 11     | <0.1       |
| Lingcod                  | 10  | 10     | <0.1       |
| Pacific staghorn sculpin | 8   | 8      | <0.1       |
| Rock greenling           | 7   | 7      | <0.1       |
| Sand sole                | 5   | 5      | <0.1       |
| Cutthroat trout          | 5   | 5      | <0.1       |
| Rainbow trout            | 5   | 5      | <0.1       |
| Kelp worm                | 2   | 2      | <0.1       |
| Total                    | 34,952  | 34,952 | 99.9       |
| Percentage               | 100.0   | 100.0  |            |

**Table 5. SPORT BOAT FISHING DATA**  
**Tillamook Bay, All Areas**  
**1971**

|                             | March | April | May   | June  | July  | Aug.   | Sept.  | Oct.   | Total  | Percentage |
|-----------------------------|-------|-------|-------|-------|-------|--------|--------|--------|--------|------------|
| Angler trips (number)       | 669   | 1,162 | 1,874 | 1,411 | 2,045 | 3,383  | 7,245  | 6,693  | 24,482 | —          |
| Fishing effort (hours)      | 2,243 | 3,973 | 7,045 | 4,795 | 6,393 | 11,740 | 31,267 | 31,020 | 98,476 | —          |
| Fishing success (catch/hr.) | 1.07  | 0.77  | 0.61  | 0.70  | 0.85  | 0.49   | 0.21   | 0.14   | 0.35   | —          |
| Catch (number)              |       |       |       |       |       |        |        |        |        |            |
| Dungeness crab              | 2,387 | 3,043 | 4,174 | 3,095 | 5,163 | 5,476  | 5,690  | 3,235  | 32,263 | 92.3       |
| Red rock crab               | 0     | 0     | 0     | 0     | 7     | 3      | 10     | 39     | 59     | 0.2        |
| Chinook salmon (adult)      | 0     | 0     | 6     | 38    | 18    | 18     | 500    | 784    | 1,364  | 3.9        |
| Coho salmon (adult)         | 0     | 0     | 0     | 0     | 0     | 74     | 239    | 126    | 439    | 1.3        |
| Redtail surfperch           | 3     | 0     | 39    | 106   | 18    | 0      | 0      | 0      | 166    | 0.5        |
| Kelp greenling              | 0     | 0     | 13    | 29    | 10    | 48     | 52     | 6      | 158    | 0.5        |
| Pacific herring             | 0     | 0     | 0     | 0     | 137   | 7      | 0      | 0      | 144    | 0.4        |
| Striped seaperch            | 0     | 0     | 22    | 25    | 7     | 11     | 7      | 0      | 72     | 0.2        |
| Pile perch                  | 0     | 0     | 6     | 29    | 25    | 3      | 0      | 0      | 63     | 0.2        |
| Northern anchovy            | 0     | 0     | 0     | 0     | 0     | 52     | 0      | 0      | 52     | 0.1        |
| Surf smelt                  | 0     | 0     | 0     | 0     | 43    | 0      | 0      | 0      | 43     | 0.1        |
| Black rockfish              | 0     | 0     | 9     | 0     | 14    | 7      | 0      | 0      | 30     | 0.1        |
| Shiner perch                | 0     | 0     | 3     | 4     | 0     | 0      | 0      | 19     | 26     | 0.1        |
| Starry flounder             | 0     | 0     | 6     | 4     | 0     | 0      | 10     | 0      | 20     | <0.1       |
| Buffalo sculpin             | 0     | 0     | 0     | 4     | 7     | 0      | 0      | 0      | 11     | <0.1       |
| Lingcod                     | 0     | 0     | 0     | 0     | 7     | 3      | 0      | 0      | 10     | <0.1       |
| Pacific staghorn sculpin    | 0     | 0     | 0     | 8     | 0     | 0      | 0      | 0      | 8      | <0.1       |
| Rock greenling              | 0     | 0     | 0     | 0     | 7     | 0      | 0      | 0      | 7      | <0.1       |
| Sand sole                   | 0     | 2     | 0     | 0     | 0     | 3      | 0      | 0      | 5      | <0.1       |
| Cutthroat trout             | 0     | 0     | 0     | 0     | 0     | 0      | 0      | 5      | 5      | <0.1       |
| Rainbow trout               | 0     | 0     | 0     | 0     | 0     | 0      | 0      | 5      | 5      | <0.1       |
| Kelp worm                   | 0     | 2     | 0     | 0     | 0     | 0      | 0      | 0      | 2      | <0.1       |
| Total                       | 2,390 | 3,047 | 4,278 | 3,342 | 5,463 | 5,705  | 6,508  | 4,219  | 34,952 | 99.9       |
| Percentage                  | 6.8   | 8.7   | 12.2  | 9.6   | 15.6  | 16.3   | 18.6   | 12.1   | 99.9   |            |

**Table 6. NUMBER OF SHORE ANGLER TRIPS  
By Month and Area, Tillamook Bay  
March 1 through October 31, 1971**

| Month      | Shore Fishing Area and Station Number |         |           |             |       |       | Total  | Percentage |
|------------|---------------------------------------|---------|-----------|-------------|-------|-------|--------|------------|
|            | North                                 | Barview | Garibaldi | Larson Cove | Trask | Bay   |        |            |
|            | Jetty                                 |         |           | Culvert     | River | Ocean |        |            |
|            | S-1                                   | S-2     | S-3       | S-4         | S-5   | S-6   |        |            |
| March      | 482                                   | 48      | 54        | 89          | 0     | 0     | 673    | 3.8        |
| April      | 886                                   | 97      | 20        | 277         | 0     | 0     | 1,280  | 7.3        |
| May        | 1,239                                 | 376     | 1         | 1,506       | 0     | 0     | 3,122  | 17.8       |
| June       | 925                                   | 10      | 66        | 1,089       | 0     | 0     | 2,090  | 11.9       |
| July       | 2,853                                 | 175     | 212       | 484         | 0     | 0     | 3,724  | 21.2       |
| August     | 2,401                                 | 182     | 241       | 544         | 0     | 0     | 3,368  | 19.2       |
| September  | 329                                   | 100     | 10        | 181         | 1,227 | 11    | 1,858  | 10.6       |
| October    | 65                                    | 26      | 4         | 61          | 1,252 | 2     | 1,410  | 8.0        |
| Total      | 9,180                                 | 1,014   | 608       | 4,231       | 2,479 | 13    | 17,525 | 99.8       |
| Percentage | 52.4                                  | 5.8     | 3.5       | 24.1        | 14.1  | 0.1   | 100.0  |            |

**Table 7. HOURS OF SHORE ANGLER USE  
By Month and Area, Tillamook Bay  
March 1 through October 31, 1971**

| Month      | Shore Fishing Area and Station Number |         |           |             |       |       | Total  | Percentage |
|------------|---------------------------------------|---------|-----------|-------------|-------|-------|--------|------------|
|            | North                                 | Barview | Garibaldi | Larson Cove | Trask | Bay   |        |            |
|            | Jetty                                 |         |           | Culvert     | River | Ocean |        |            |
|            | S-1                                   | S-2     | S-3       | S-4         | S-5   | S-6   |        |            |
| March      | 954                                   | 95      | 107       | 177         | 0     | 0     | 1,333  | 3.7        |
| April      | 1,825                                 | 201     | 42        | 570         | 0     | 0     | 2,638  | 7.4        |
| May        | 2,570                                 | 780     | 3         | 3,124       | 0     | 0     | 6,477  | 18.2       |
| June       | 1,836                                 | 21      | 131       | 2,163       | 0     | 0     | 4,151  | 11.7       |
| July       | 5,786                                 | 356     | 431       | 982         | 0     | 0     | 7,555  | 21.2       |
| August     | 4,838                                 | 368     | 487       | 1,097       | 0     | 0     | 6,790  | 19.1       |
| September  | 666                                   | 202     | 22        | 367         | 2,486 | 23    | 3,766  | 10.6       |
| October    | 132                                   | 53      | 9         | 124         | 2,544 | 5     | 2,867  | 8.1        |
| Total      | 18,607                                | 2,076   | 1,232     | 8,604       | 5,030 | 28    | 35,577 | 100.0      |
| Percentage | 52.3                                  | 5.8     | 3.5       | 24.2        | 14.1  | 0.1   | 100.0  |            |

**Table 8. MARINE ANIMALS CAUGHT BY SHORE ANGLERS  
Tillamook Bay, By Species and Area  
March 1 through October 31, 1971**

| Species                  | Shore Fishing Area and Station Number |                |                  |                |              |                | Total         | Percentage   |
|--------------------------|---------------------------------------|----------------|------------------|----------------|--------------|----------------|---------------|--------------|
|                          | North                                 | Barview<br>S-2 | Garibaldi<br>S-3 | Larson Cove    | Trask        | Bay            |               |              |
|                          | Jetty<br>S-1                          |                |                  | Culvert<br>S-4 | River<br>S-5 | Ocean<br>S-6   |               |              |
| Dungeness crab           | 172                                   | 26             | 173              | 22             | 0            | 0              | 393           | 2.2          |
| Red rock crab            | 6                                     | 0              | 0                | 0              | 0            | 0              | 6             | <0.1         |
| Pile perch               | 212                                   | 299            | 8                | 3,189          | 0            | 0              | 3,708         | 20.7         |
| Kelp greenling           | 2,934                                 | 208            | 24               | 168            | 0            | 0              | 3,334         | 18.6         |
| Shiner perch             | 14                                    | 4              | 955              | 870            | 0            | 0              | 1,843         | 10.3         |
| Black rockfish           | 1,471                                 | 12             | 115              | 64             | 0            | 0              | 1,662         | 9.3          |
| Striped seaperch         | 367                                   | 499            | 31               | 713            | 0            | 0              | 1,610         | 9.0          |
| Redtail surfperch        | 313                                   | 45             | 7                | 1,004          | 0            | 0              | 1,369         | 7.6          |
| Pacific tomcod           | 0                                     | 0              | 1,025            | 24             | 0            | 0              | 1,049         | 5.8          |
| Walleye surfperch        | 7                                     | 38             | 7                | 483            | 0            | 0              | 535           | 3.0          |
| Rock greenling           | 441                                   | 52             | 0                | 30             | 0            | 0              | 523           | 2.9          |
| Buffalo sculpin          | 274                                   | 11             | 0                | 51             | 0            | 0              | 336           | 1.9          |
| Chinook salmon (adult)   | 7                                     | 0              | 0                | 0              | 285          | 0              | 292           | 1.6          |
| Starry flounder          | 20                                    | 7              | 0                | 161            | 0            | 0              | 188           | 1.0          |
| Pacific staghorn sculpin | 29                                    | 13             | 23               | 93             | 0            | 0              | 158           | 0.9          |
| White seaperch           | 0                                     | 0              | 0                | 118            | 0            | 0              | 118           | 0.7          |
| Cabezon                  | 108                                   | 0              | 0                | 5              | 0            | 0              | 113           | 0.6          |
| Coho salmon (adult)      | 37                                    | 0              | 0                | 0              | 44           | 5              | 86            | 0.5          |
| Brown Irish lord         | 38                                    | 0              | 0                | 0              | 0            | 0              | 38            | 0.2          |
| Lingcod                  | 30                                    | 7              | 0                | 0              | 0            | 0              | 37            | 0.2          |
| Cutthroat trout          | 0                                     | 0              | 0                | 12             | 25           | 0              | 37            | 0.2          |
| Red Irish lord           | 31                                    | 0              | 0                | 0              | 0            | 0              | 31            | 0.2          |
| Rainbow trout            | 0                                     | 0              | 0                | 0              | 15           | 0              | 15            | 0.1          |
| Coho salmon (juvenile)   | 0                                     | 0              | 14               | 0              | 0            | 0              | 14            | 0.1          |
| Wolf-eel                 | 8                                     | 0              | 0                | 0              | 0            | 0              | 8             | <0.1         |
| Copper rockfish          | 7                                     | 0              | 0                | 0              | 0            | 0              | 7             | <0.1         |
| Blue rockfish            | 7                                     | 0              | 0                | 0              | 0            | 0              | 7             | <0.1         |
| Pacific herring          | 7                                     | 0              | 0                | 0              | 0            | 0              | 7             | <0.1         |
| Unidentified fish        | 15                                    | 0              | 24               | 390            | 0            | 0              | 429           | 2.4          |
| <b>Total</b>             | <b>6,555</b>                          | <b>1,221</b>   | <b>2,406</b>     | <b>7,397</b>   | <b>369</b>   | <b>5</b>       | <b>17,953</b> | <b>100.0</b> |
| <b>Percentage</b>        | <b>36.5</b>                           | <b>6.8</b>     | <b>13.4</b>      | <b>41.2</b>    | <b>2.1</b>   | <b>&lt;0.1</b> | <b>100.0</b>  |              |



Table 9. SHORE FISHING DATA  
Tillamook Bay, All Areas  
1971

|                             | March | April | May   | June  | July  | Aug.  | Sept. | Oct.  | Total  | Percentage |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|------------|
| Angler trips (number)       | 673   | 1,280 | 3,122 | 2,090 | 3,724 | 3,368 | 1,858 | 1,410 | 17,525 | —          |
| Fishing effort (hours)      | 1,333 | 2,638 | 6,477 | 4,151 | 7,555 | 6,790 | 3,766 | 2,867 | 35,577 | —          |
| Fishing success (catch/hr.) | 0.40  | 0.50  | 0.85  | 0.78  | 0.48  | 0.40  | 0.21  | 0.10  | 0.50   | —          |
| Catch (number)              |       |       |       |       |       |       |       |       |        |            |
| Dungeness crab              | 26    | 24    | 126   | 56    | 147   | 14    | 0     | 0     | 393    | 2.2        |
| Red rock crab               | 0     | 6     | 0     | 0     | 0     | 0     | 0     | 0     | 6      | <0.1       |
| Pile perch                  | 0     | 386   | 2,352 | 545   | 204   | 66    | 143   | 12    | 3,708  | 20.7       |
| Kelp greenling              | 192   | 392   | 487   | 588   | 1,156 | 387   | 120   | 12    | 3,334  | 18.6       |
| Shiner perch                | 0     | 0     | 150   | 502   | 672   | 358   | 69    | 92    | 1,843  | 10.3       |
| Black rockfish              | 148   | 193   | 248   | 311   | 418   | 306   | 34    | 4     | 1,662  | 9.3        |
| Striped seaperch            | 43    | 90    | 676   | 296   | 244   | 133   | 120   | 8     | 1,610  | 9.0        |
| Redtail surfperch           | 25    | 12    | 525   | 694   | 106   | 7     | 0     | 0     | 1,369  | 7.6        |
| Pacific tomcod              | 0     | 0     | 0     | 0     | 24    | 1,025 | 0     | 0     | 1,049  | 5.8        |
| Walleye surfperch           | 0     | 36    | 217   | 56    | 147   | 57    | 10    | 12    | 535    | 3.0        |
| Rock greenling              | 0     | 6     | 67    | 42    | 262   | 141   | 5     | 0     | 523    | 2.9        |
| Buffalo sculpin             | 35    | 90    | 37    | 78    | 49    | 36    | 11    | 0     | 336    | 1.9        |
| Chinook salmon (adult)      | 0     | 0     | 0     | 0     | 0     | 7     | 162   | 123   | 292    | 1.6        |
| Starry flounder             | 52    | 36    | 59    | 14    | 8     | 14    | 5     | 0     | 188    | 1.0        |
| Pacific staghorn sculpin    | 0     | 6     | 15    | 0     | 65    | 44    | 28    | 0     | 158    | 0.9        |
| White seaperch              | 0     | 0     | 97    | 14    | 0     | 7     | 0     | 0     | 118    | 0.7        |
| Cabezon                     | 8     | 24    | 0     | 28    | 41    | 7     | 5     | 0     | 113    | 0.6        |
| Coho salmon (adult)         | 0     | 0     | 0     | 0     | 0     | 37    | 45    | 4     | 86     | 0.5        |
| Brown Irish lord            | 0     | 0     | 0     | 0     | 16    | 22    | 0     | 0     | 38     | 0.2        |
| Lingcod                     | 0     | 0     | 29    | 0     | 8     | 0     | 0     | 0     | 37     | 0.2        |
| Cutthroat trout             | 0     | 0     | 7     | 0     | 0     | 0     | 5     | 25    | 37     | 0.2        |
| Red Irish lord              | 0     | 24    | 0     | 0     | 0     | 7     | 0     | 0     | 31     | 0.2        |
| Rainbow trout               | 0     | 0     | 0     | 0     | 0     | 0     | 11    | 4     | 15     | 0.1        |
| Coho salmon (juvenile)      | 0     | 0     | 0     | 0     | 0     | 14    | 0     | 0     | 14     | 0.1        |
| Wolf-eel                    | 0     | 0     | 0     | 0     | 8     | 0     | 0     | 0     | 8      | <0.1       |
| Copper rockfish             | 0     | 0     | 7     | 0     | 0     | 0     | 0     | 0     | 7      | <0.1       |
| Blue rockfish               | 0     | 0     | 0     | 0     | 0     | 7     | 0     | 0     | 7      | <0.1       |
| Pacific herring             | 0     | 0     | 0     | 0     | 0     | 7     | 0     | 0     | 7      | <0.1       |
| Unidentified fish           | 8     | 0     | 390   | 7     | 24    | 0     | 0     | 0     | 429    | 2.4        |
| Total                       | 537   | 1,325 | 5,489 | 3,231 | 3,599 | 2,703 | 773   | 296   | 17,953 | 100.0      |
| Percentage                  | 3.0   | 7.4   | 30.6  | 18.0  | 20.0  | 15.1  | 4.3   | 1.6   | 100.0  |            |

**Table 10. NUMBER OF TIDEFLAT USER TRIPS  
By Month and Area, Tillamook Bay  
March 1 through October 31, 1971**

| Month             | Tideflat and Station Number |                             |                       |                     | Total         | Percentage  |
|-------------------|-----------------------------|-----------------------------|-----------------------|---------------------|---------------|-------------|
|                   | Garibaldi<br>Flat<br>T-1    | Hobsonville<br>Point<br>T-2 | County<br>Ramp<br>T-3 | Bay<br>Ocean<br>T-4 |               |             |
| March             | 1,906                       | 63                          | 0                     | 1,776               | 3,745         | 15.3        |
| April             | 1,307                       | 112                         | 0                     | 1,606               | 3,025         | 12.4        |
| May               | 1,827                       | 133                         | 0                     | 1,234               | 3,194         | 13.1        |
| June              | 2,111                       | 227                         | 0                     | 1,856               | 4,194         | 17.1        |
| July              | 3,137                       | 390                         | 17                    | 2,067               | 5,611         | 22.9        |
| August            | 2,083                       | 78                          | 0                     | 1,482               | 3,643         | 14.9        |
| September         | 649                         | 24                          | 0                     | 358                 | 1,031         | 4.2         |
| October           | 28                          | 0                           | 0                     | 0                   | 28            | <0.1        |
| <b>Total</b>      | <b>13,048</b>               | <b>1,027</b>                | <b>17</b>             | <b>10,379</b>       | <b>24,471</b> | <b>99.9</b> |
| <b>Percentage</b> | <b>53.3</b>                 | <b>4.2</b>                  | <b>0.1</b>            | <b>42.4</b>         | <b>100.0</b>  |             |

**Table 11. HOURS OF TIDEFLAT USE  
By Month and Area, Tillamook Bay  
March 1 through October 31, 1971**

| Month             | Tideflat and Station Number |                             |                       |                     | Total         | Percentage   |
|-------------------|-----------------------------|-----------------------------|-----------------------|---------------------|---------------|--------------|
|                   | Garibaldi<br>Flat<br>T-1    | Hobsonville<br>Point<br>T-2 | County<br>Ramp<br>T-3 | Bay<br>Ocean<br>T-4 |               |              |
| March             | 2,647                       | 88                          | 0                     | 2,467               | 5,202         | 13.6         |
| April             | 2,010                       | 172                         | 0                     | 2,471               | 4,653         | 12.2         |
| May               | 2,854                       | 208                         | 0                     | 1,928               | 4,990         | 13.0         |
| June              | 3,248                       | 349                         | 0                     | 2,856               | 6,453         | 16.9         |
| July              | 5,228                       | 650                         | 28                    | 3,445               | 9,351         | 24.4         |
| August            | 3,471                       | 130                         | 0                     | 2,470               | 6,071         | 15.9         |
| September         | 940                         | 35                          | 0                     | 519                 | 1,494         | 3.9          |
| October           | 41                          | 0                           | 0                     | 0                   | 41            | 0.1          |
| <b>Total</b>      | <b>20,439</b>               | <b>1,632</b>                | <b>28</b>             | <b>16,156</b>       | <b>38,255</b> | <b>100.0</b> |
| <b>Percentage</b> | <b>53.4</b>                 | <b>4.3</b>                  | <b>0.1</b>            | <b>42.2</b>         | <b>100.0</b>  |              |

**Table 12. MARINE ANIMALS CAUGHT BY TIDEFLAT USERS  
Tillamook Bay, by Species and Area  
March 1 through October 31, 1971**

| Species                | Tideflat and Station Number |               |                |                | Total          | Percentage   |
|------------------------|-----------------------------|---------------|----------------|----------------|----------------|--------------|
|                        | Garibaldi                   | Hobsonville   | County         | Bay            |                |              |
|                        | Flat<br>T-1                 | Point<br>T-2  | Ramp<br>T-3    | Ocean<br>T-4   |                |              |
| Cockle clam            | 63,741                      | 11,014        | 123            | 177,024        | 251,902        | 38.7         |
| Native littleneck clam | 239,615                     | 1,554         | 0              | 2,747          | 243,916        | 37.5         |
| Butter clam            | 65,113                      | 394           | 0              | 168            | 65,675         | 10.1         |
| Gaper clam             | 21,477                      | 1,613         | 30             | 18,328         | 41,448         | 6.4          |
| Softshell clam         | 45                          | 204           | 0              | 9,209          | 9,458          | 1.5          |
| Bentnose clam          | 329                         | 29            | 0              | 638            | 996            | <0.1         |
| Razor clam             | 0                           | 0             | 0              | 223            | 223            | <0.1         |
| Sand clam              | 203                         | 0             | 0              | 3              | 206            | <0.1         |
| Bodega tellen clam     | 9                           | 0             | 0              | 0              | 9              | <0.1         |
| Manila littleneck clam | 0                           | 0             | 0              | 3              | 3              | <0.1         |
| Mud shrimp             | 2,748                       | 15,467        | 0              | 4,835          | 23,050         | 3.5          |
| Ghost shrimp           | 3,109                       | 3,759         | 0              | 3,095          | 9,963          | 1.5          |
| Kelp worm              | 212                         | 554           | 0              | 43             | 809            | <0.1         |
| Bay mussel             | 216                         | 0             | 0              | 0              | 216            | <0.1         |
| Saddleback gunnel      | 108                         | 51            | 0              | 0              | 159            | <0.1         |
| Algae                  | 4                           | 0             | 0              | 117            | 121            | <0.1         |
| Dungeness crab         | 9                           | 0             | 0              | 66             | 75             | <0.1         |
| Shore crab             | 45                          | 0             | 0              | 0              | 45             | <0.1         |
| Snail                  | 0                           | 0             | 0              | 23             | 23             | <0.1         |
| Buffalo sculpin        | 0                           | 7             | 0              | 0              | 7              | <0.1         |
| Starry flounder        | 0                           | 0             | 0              | 3              | 3              | <0.1         |
| Unidentified shrimp    | 1,742                       | 306           | 0              | 203            | 2,251          | <0.1         |
| <b>Total</b>           | <b>398,725</b>              | <b>34,952</b> | <b>153</b>     | <b>216,728</b> | <b>650,558</b> | <b>100.0</b> |
| <b>Percentage</b>      | <b>61.3</b>                 | <b>5.4</b>    | <b>&lt;0.1</b> | <b>33.3</b>    | <b>100.0</b>   |              |

**Table 13. SUMMARY**  
**Number of Angler Trips, Hours of Effort, and Animals Caught**  
**Tillamook Bay, by Station**  
**March 1 through October 31, 1971**

| Station Number     | No. Angler Trips | Angler Hours   | Catch         |               |                |               | Total          |
|--------------------|------------------|----------------|---------------|---------------|----------------|---------------|----------------|
|                    |                  |                | Finfish       | Crabs         | Clams          | Misc. Invert. |                |
| B-1                | 24,482           | 98,476         | 2,628         | 32,322        | 0              | 2             | 34,952         |
| <b>Total</b>       | <b>24,482</b>    | <b>98,476</b>  | <b>2,628</b>  | <b>32,322</b> | <b>0</b>       | <b>2</b>      | <b>34,952</b>  |
| S-1                | 9,180            | 18,607         | 6,377         | 178           | 0              | 0             | 6,555          |
| S-2                | 1,014            | 2,076          | 1,195         | 26            | 0              | 0             | 1,221          |
| S-3                | 608              | 1,232          | 2,233         | 173           | 0              | 0             | 2,406          |
| S-4                | 4,231            | 8,604          | 7,375         | 22            | 0              | 0             | 7,397          |
| S-5                | 2,479            | 5,030          | 369           | 0             | 0              | 0             | 369            |
| S-6                | 13               | 28             | 5             | 0             | 0              | 0             | 5              |
| <b>Total</b>       | <b>17,525</b>    | <b>35,577</b>  | <b>17,554</b> | <b>399</b>    | <b>0</b>       | <b>0</b>      | <b>17,953</b>  |
| T-1                | 13,048           | 20,439         | 108           | 54            | 390,532        | 8,031         | 398,725        |
| T-2                | 1,027            | 1,632          | 58            | 0             | 14,808         | 20,086        | 34,952         |
| T-3                | 17               | 28             | 0             | 0             | 153            | 0             | 153            |
| T-4                | 10,379           | 16,156         | 3             | 66            | 208,343        | 8,316         | 216,728        |
| <b>Total</b>       | <b>24,471</b>    | <b>38,255</b>  | <b>169</b>    | <b>120</b>    | <b>613,836</b> | <b>36,433</b> | <b>650,558</b> |
| <b>Grand Total</b> | <b>66,478</b>    | <b>172,308</b> | <b>20,351</b> | <b>32,841</b> | <b>613,836</b> | <b>36,435</b> | <b>703,463</b> |

**Table 14. SUMMARY**  
**Number of Angler Trips, Hours of Effort, and Animals Caught**  
**Tillamook Bay, by Month**  
**March 1 through October 31, 1971**

| Fishery     | Month     | No. Angler Trips | Angler Hours | Catch   |        |         |               | Total               |
|-------------|-----------|------------------|--------------|---------|--------|---------|---------------|---------------------|
|             |           |                  |              | Finfish | Crabs  | Clams   | Misc. Invert. |                     |
| Boat        | March     | 669              | 2,243        | 3       | 2,387  | 0       | 0             | 2,390               |
|             | April     | 1,162            | 3,973        | 2       | 3,043  | 0       | 2             | 3,047               |
|             | May       | 1,874            | 7,045        | 104     | 4,174  | 0       | 0             | 4,278               |
|             | June      | 1,411            | 4,795        | 247     | 3,095  | 0       | 0             | 3,342               |
|             | July      | 2,045            | 6,393        | 293     | 5,170  | 0       | 0             | 5,463               |
|             | August    | 3,383            | 11,740       | 226     | 5,479  | 0       | 0             | 5,705               |
|             | September | 7,245            | 31,267       | 808     | 5,700  | 0       | 0             | 6,508               |
|             | October   | 6,693            | 31,020       | 945     | 3,274  | 0       | 0             | 4,219               |
|             | Total     | 24,482           | 98,476       | 2,628   | 32,322 | 0       | 2             | 34,952              |
| Shore       | March     | 673              | 1,333        | 511     | 26     | 0       | 0             | 537                 |
|             | April     | 1,280            | 2,638        | 1,295   | 30     | 0       | 0             | 1,325               |
|             | May       | 3,122            | 6,477        | 5,363   | 126    | 0       | 0             | 5,489               |
|             | June      | 2,090            | 4,151        | 3,175   | 56     | 0       | 0             | 3,231               |
|             | July      | 3,724            | 7,555        | 3,452   | 147    | 0       | 0             | 3,599               |
|             | August    | 3,368            | 6,790        | 2,689   | 14     | 0       | 0             | 2,703               |
|             | September | 1,858            | 3,766        | 773     | 0      | 0       | 0             | 773                 |
|             | October   | 1,410            | 2,867        | 296     | 0      | 0       | 0             | 296                 |
|             | Total     | 17,525           | 35,577       | 17,554  | 399    | 0       | 0             | 17,953              |
| Tideflat    | March     | 3,745            | 5,202        | 26      | 18     | 93,900  | 5,600         | 99,544 <sup>1</sup> |
|             | April     | 3,025            | 4,653        | 21      | 15     | 75,900  | 4,500         | 80,436              |
|             | May       | 3,194            | 4,990        | 22      | 16     | 80,100  | 4,800         | 84,938              |
|             | June      | 4,194            | 6,453        | 29      | 21     | 105,200 | 6,200         | 111,450             |
|             | July      | 5,611            | 9,351        | 39      | 27     | 140,700 | 8,400         | 149,166             |
|             | August    | 3,643            | 6,071        | 25      | 18     | 91,400  | 5,400         | 96,843              |
|             | September | 1,031            | 1,494        | 7       | 5      | 25,900  | 1,500         | 27,412              |
|             | October   | 28               | 41           | 0       | 0      | 700     | 40            | 740                 |
|             | Total     | 24,471           | 38,255       | 169     | 120    | 613,800 | 36,440        | 650,529             |
| Combined    | March     | 5,087            | 8,778        | 540     | 2,431  | 93,900  | 5,600         | 102,471             |
|             | April     | 5,467            | 11,264       | 1,318   | 3,088  | 75,900  | 4,502         | 84,808              |
|             | May       | 8,190            | 18,512       | 5,489   | 4,316  | 80,100  | 4,800         | 94,705              |
|             | June      | 7,695            | 15,399       | 3,451   | 3,172  | 105,200 | 6,200         | 118,023             |
|             | July      | 11,380           | 23,299       | 3,784   | 5,344  | 140,700 | 8,400         | 158,228             |
|             | August    | 10,394           | 24,601       | 2,940   | 5,511  | 91,400  | 5,400         | 105,251             |
|             | September | 10,134           | 36,527       | 1,588   | 5,705  | 25,900  | 1,500         | 34,693              |
|             | October   | 8,131            | 33,928       | 1,241   | 3,274  | 700     | 40            | 5,255               |
| Grand Total |           | 66,478           | 172,308      | 20,351  | 32,841 | 613,800 | 36,442        | 703,434             |

<sup>1</sup> Catch data for the tideflat fishery determined by multiplying the average catch per year times the number of angler trips per month. Catch data totals consequently differ from those shown in Table 13.

**TABLE 15. TAXONOMIC LIST OF SPECIES HARVESTED**  
**By Estuarine Resource Users, Tillamook Bay**  
**March 1 through October 31, 1971**

| Common Name                        | Local Names  | Scientific Name  |
|------------------------------------|--|--|
| <b>Fish</b>                        |  |  |
| Black rockfish                     | Black sea bass, black snapper  | <i>Sebastes melanops</i>                                       |
| Blue rockfish                      | Bass   | <i>Sebastes mystinus</i>                                       |
| Brown Irish lord                   | Bullhead   | <i>Hemilepidotus spinosus</i>                                  |
| Buffalo sculpin                    | Bullhead   | <i>Enophrys bison</i>  |
| Cabezon                            | Rock cod, bullhead   | <i>Scorpaenichthys marmoratus</i>                              |
| Chinook salmon                     | King salmon, salmon  | <i>Oncorhynchus tshawytscha</i>                                |
| Coho salmon                        | Silver salmon  | <i>Oncorhynchus kisutch</i>                                    |
| Copper rockfish                    | Red snapper, bass  | <i>Sebastes caurinus</i>                                       |
| Cutthroat trout                    | Blueback, harvest trout, sea runs                                    | <i>Salmo clarki</i>  |
| Kelp greenling                     | Sea trout  | <i>Hexagrammos decagrammus</i>                                 |
| Lingcod                            |  | <i>Ophiodon elongatus</i>                                      |
| Northern anchovy                   |  | <i>Engraulis mordax</i>  |
| Pacific herring                    |  | <i>Clupea harengus pallasi</i>                                 |
| Pacific staghorn sculpin           | Bullhead   | <i>Leptocottus armatus</i>                                     |
| Pacific tomcod                     |  | <i>Microgadus proximus</i>                                     |
| Pile perch                         |  | <i>Rhacochilus vacca</i>                                       |
| Rainbow trout                      |  | <i>Salmo gairdneri</i>   |
| Red Irish Lord                     | Bullhead   | <i>Hemilepidotus hemilepidotus</i>                             |
| Redtail surfperch                  |  | <i>Amphistichus rhodoterus</i>                                 |
| Rock greenling                     | Seatrout   | <i>Hexagrammos lagocephalus</i>                                |
| Saddleback gunnel                  |  | <i>Pholis ornata</i>   |
| Sand sole                          |  | <i>Psettichthys melanostictus</i>                              |
| Shiner perch                       | Shiners  | <i>Cymatogaster aggregata</i>                                  |
| Starry flounder                    |  | <i>Platichthys stellatus</i>                                   |
| Striped seaperch                   | Rainbow perch  | <i>Embiotoca lateralis</i>                                     |
| Surf smelt                         |  | <i>Hypomesus pretiosus</i>                                     |
| Walleye surfperch                  |  | <i>Hyperprosopon argenteum</i>                                 |
| White seaperch                     |  | <i>Phanerodon furcatus</i>                                     |
| Wolf-eel                           |  | <i>Anarrhichthys ocellatus</i>                                 |
| <b>Clams</b>                       |  |  |
| Bentnose clam                      |  | <i>Macoma nasuta</i>   |
| Bodega tellen clam                 |  | <i>Tellina bodegensis</i>                                      |
| Butter clam                        | Washington clam, quahog, Coney Island, beef steak, giant Oregon clam | <i>Saxidomus giganteus</i>                                     |
| Cockle clam                        | Basket cockle, steamer   | <i>Clinocardium nuttallii</i>                                  |
| Gaper clam                         | Blue clam, Empire clam, horse clam, horseneck clam, bluneck          | <i>Tresus capax</i>  |
| Manila littleneck clam             | Steamer clam, butter clam  | <i>Venerupis semidecussata</i>                                 |
| Native littleneck clam             | Steamer clam, butter clam  | <i>Venerupis staminea</i>                                      |
| Razor clam                         |  | <i>Siliqua patula</i>  |
| Sand clam                          |  | <i>Macoma secta</i>  |
| Softshell clam                     | Mud clam, bay clam   | <i>Mya arenaria</i>  |
| <b>Crabs</b>                       |  |  |
| Dungeness crab                     | Market crab  | <i>Cancer magister</i>   |
| Red rock crab                      | Japanese crab, rock crab   | <i>Cancer productus</i>  |
| Shore crab                         | Mud crab   | <i>Hemigrapsus oregonensis</i><br>and <i>Hemigrapsus nudus</i> |
| <b>Miscellaneous Invertebrates</b> |  |  |
| Bay mussel                         |  | <i>Mytilus edulis</i>  |
| Ghost shrimp                       | Sand shrimp  | <i>Callinassa californiensis</i>                               |
| Kelp worm                          | Clam worm, mussel worm   | <i>Nereis sp.</i>  |
| Mud shrimp                         | Sand shrimp  | <i>Upogebia pugettensis</i>                                    |

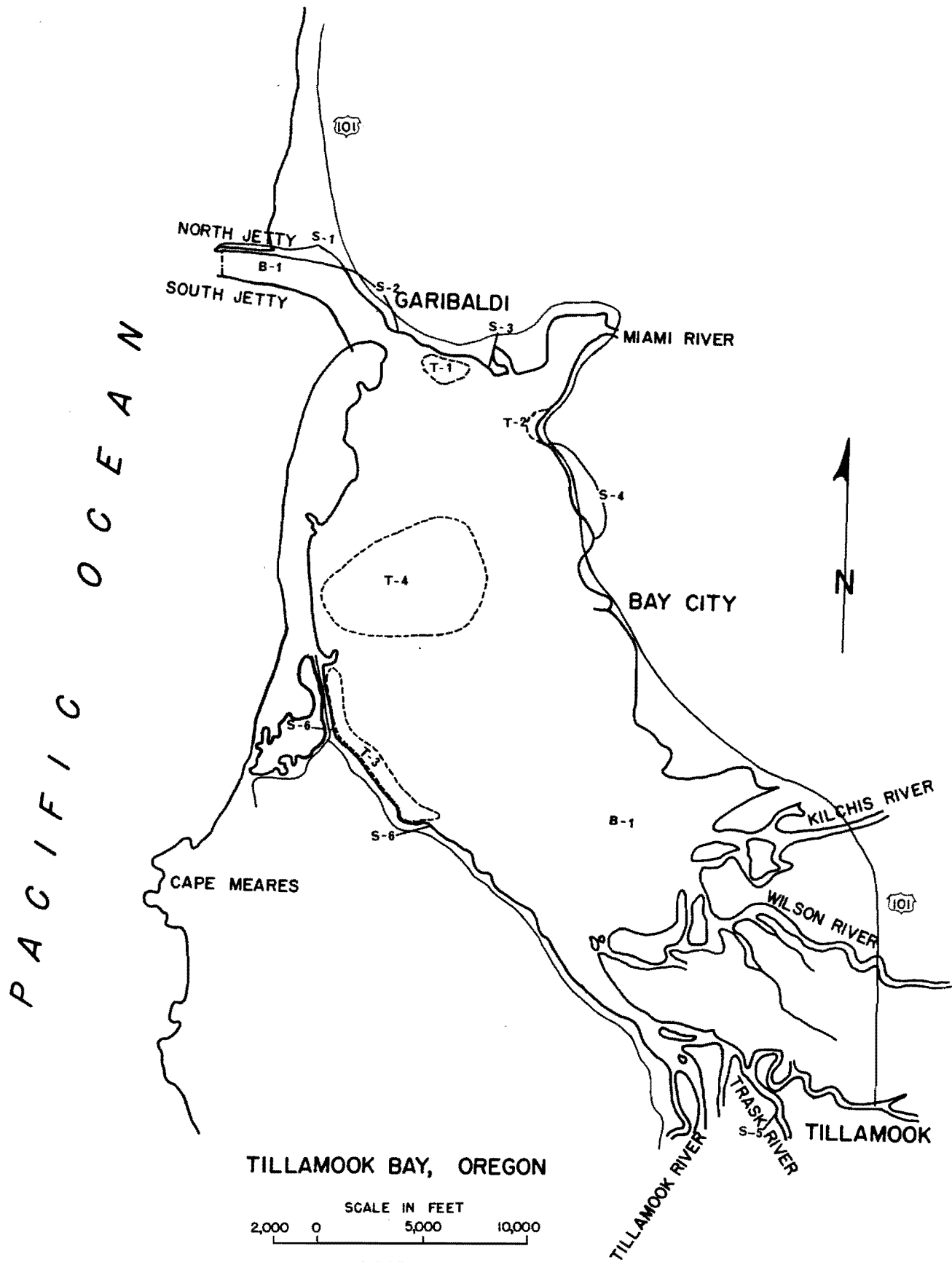
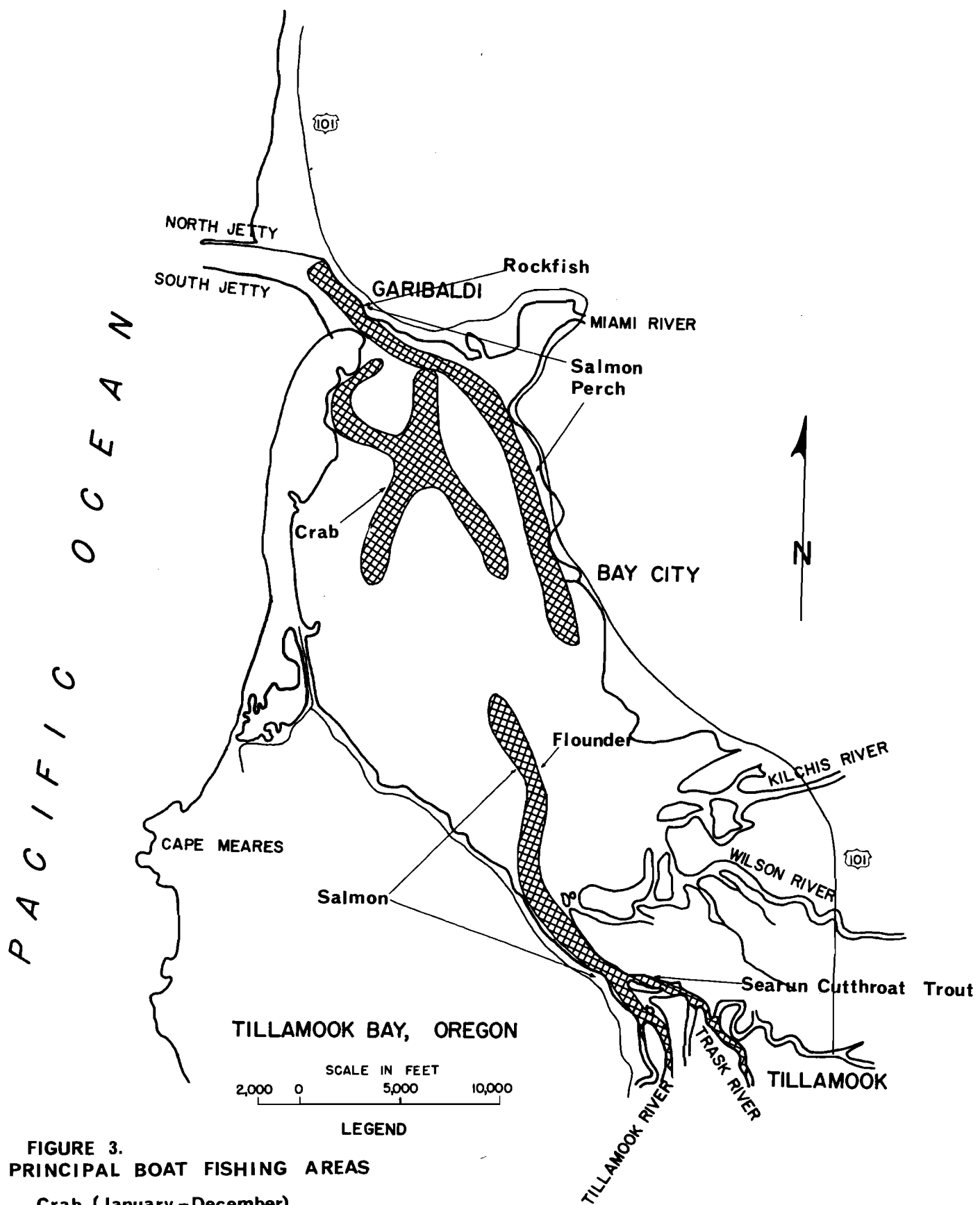


FIGURE 2. 1971 FCO RESOURCE SURVEY SAMPLING AREAS

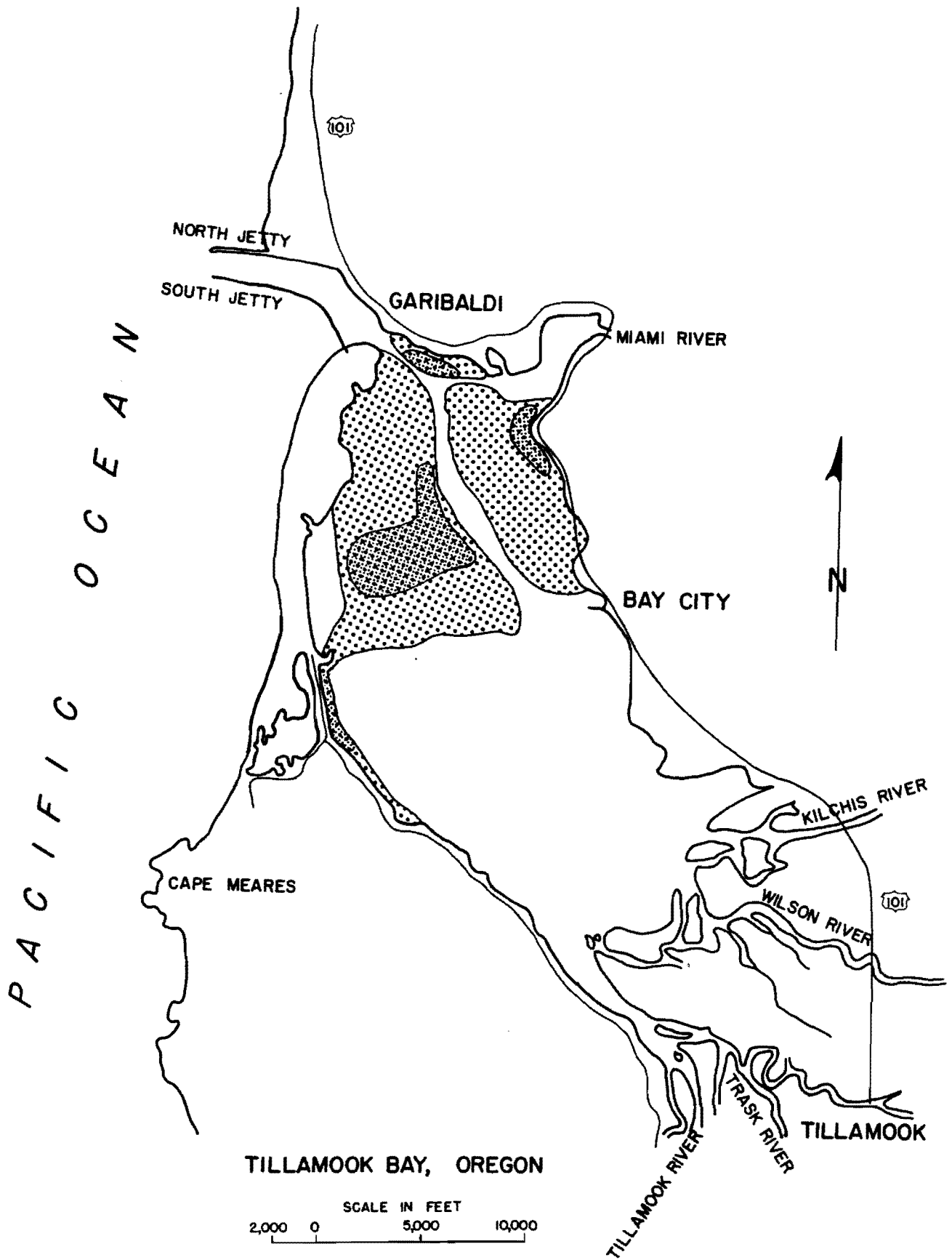
- S - Shore Fishing Area
- B - Boat Fishing Area
- T - Tideflat Use Area



**FIGURE 3.**  
**PRINCIPAL BOAT FISHING AREAS**

- Crab (January - December)
  - Salmon (May - November)
  - Perch (May - July)
  - Rockfish (May - August)
  - Flounder (May - June)
  - Searun Cutthroat Trout (July - October)
- 1971





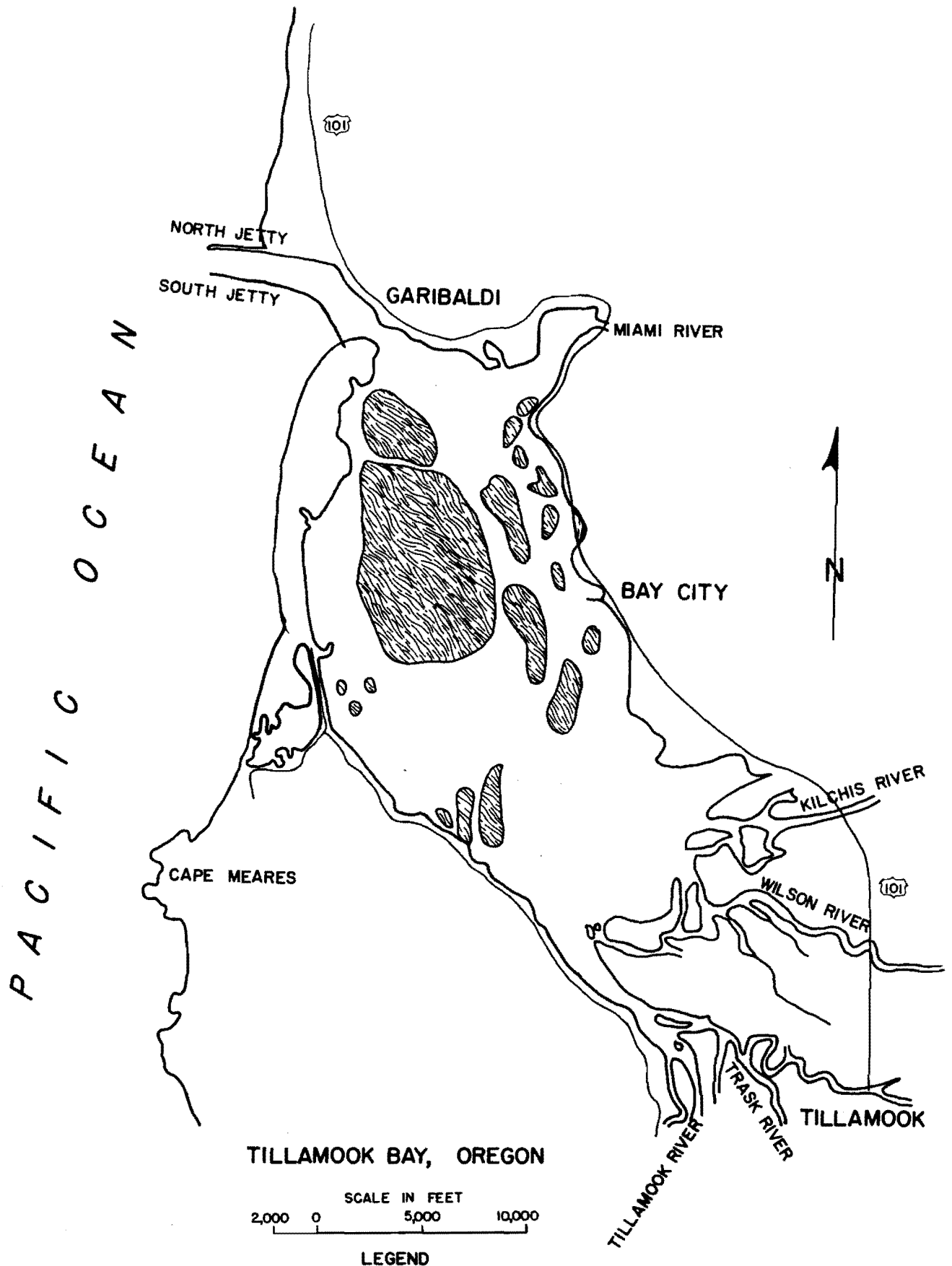


FIGURE 5.  EEL GRASS BEDS, 1971

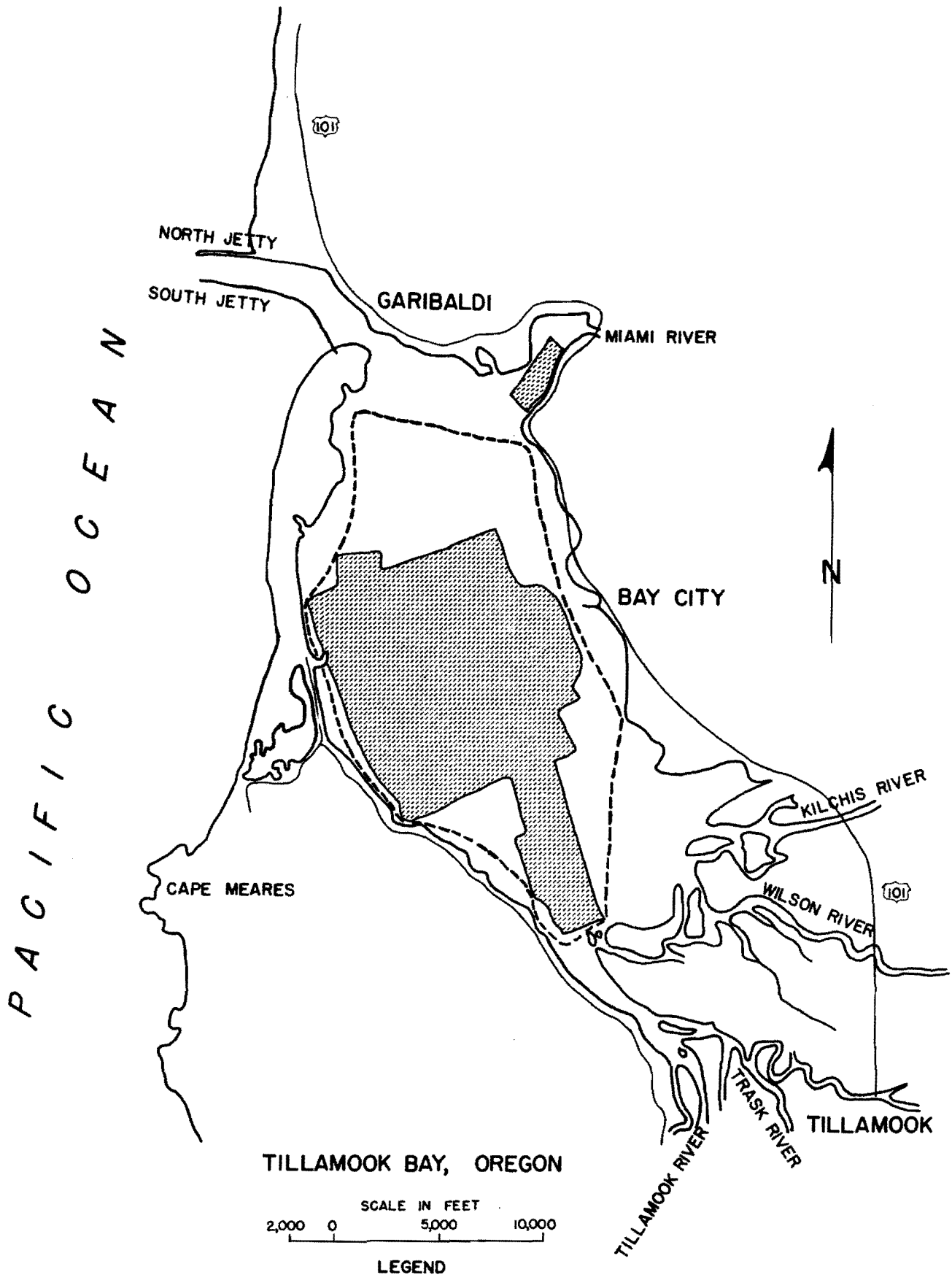




FIGURE 6.  COMMERCIAL OYSTER LEASES, 1971  
 POTENTIAL OYSTER GROWING AREA

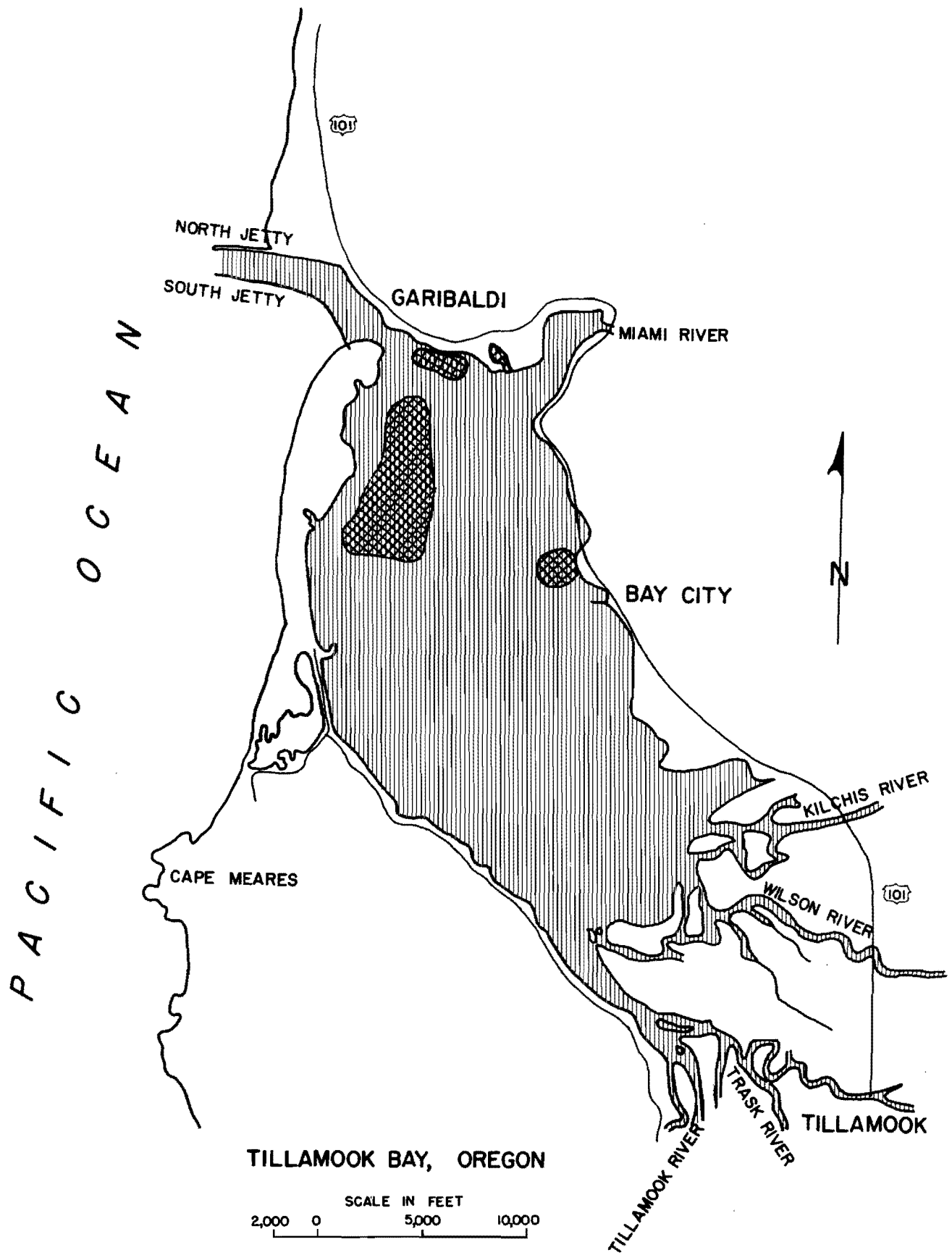


FIGURE 7. **LEGEND**  
 [Vertical lines] FOOD PRODUCTION AREAS, FISH FEEDING AREAS AND FISH MIGRATION ROUTES, 1971  
 [Cross-hatch] KNOWN HERRING SPAWNING AREAS

