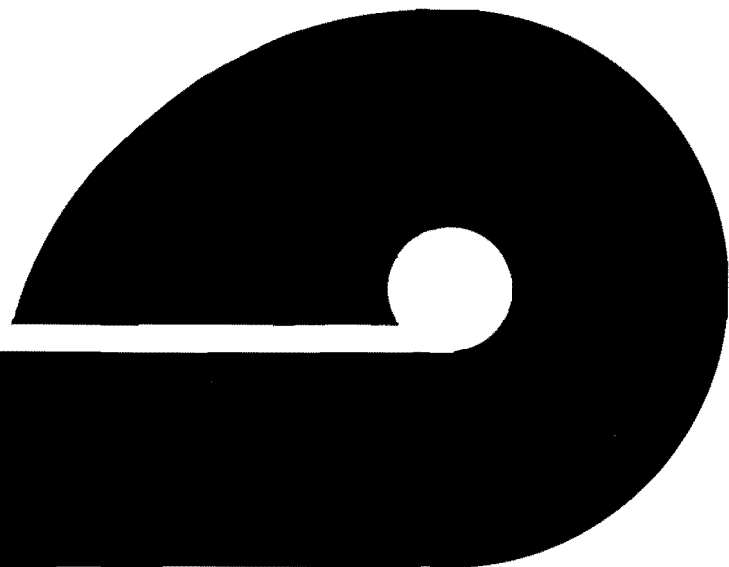


FISH COMMISSION OF OREGON

# NETARTS BAY ESTUARY

A STUDY IN RESOURCE USE  
DIVISION OF MANAGEMENT AND RESEARCH



# 1971 NETARTS BAY ESTUARY 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

January 1974

## CONTENTS

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

## FIGURES

Figure No.		Page No.
1	Location of Netarts 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 Growing Area .....	27
7	Food Production Areas, Fish Feeding Areas, Fish Migration Routes, and Known Herring Spawning Area .....	28

## TABLES

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

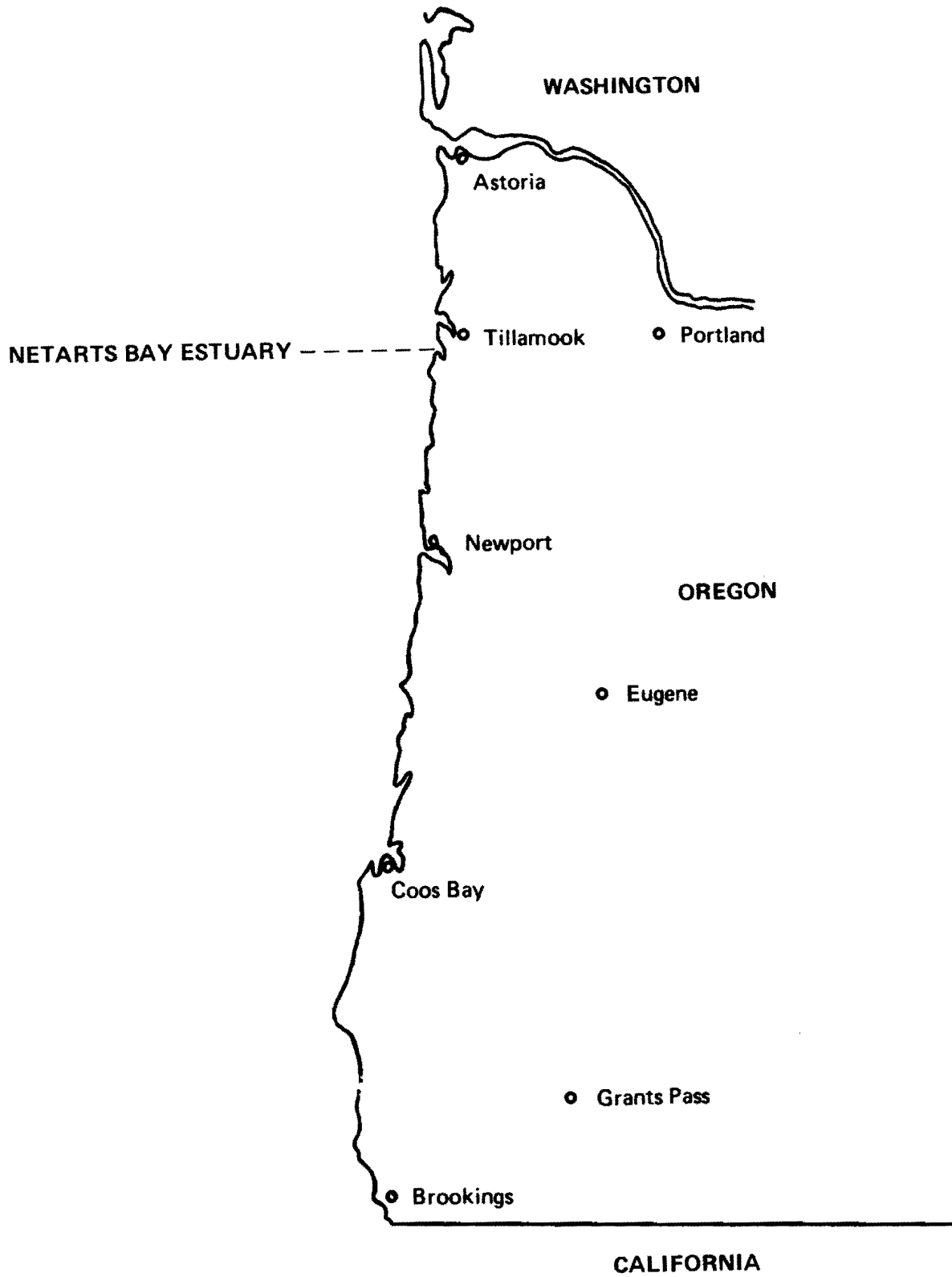


Figure 1. Location of Netarts Bay Estuary

# **1971 NETARTS 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. Anadromous sport fisheries in the upper portions of most estuaries were not included in the study due to 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 Netarts Bay study.

## **PROCEDURE**

Netarts Bay is located 73 miles south of the Columbia River (Figure 1). The 2,325-acre bay contains 1,513 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: people that reside west of the coast range summit within the county where the sampled estuary is found, (2) state: residents of Oregon not classified as county, and (3) nonstate: nonresidents of Oregon.

The study area included the entire estuary. Survey areas and their station numbers are outlined in Table 1 and are shown in Figure 2.

The 1971 Netarts Bay commercial landings of shellfish and their value, taken from Fish Commission catch statistics 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 area.
5. Food production areas, fish feeding areas, fish migration routes, and known herring spawning area.

## **RESULTS**

During the study 7,827 boat, shore, tideflat, and scuba resource user interviews were obtained to estimate catch and effort values and angler origin. 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 Netarts 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 10,700 boat angler trips were expended on Netarts Bay (Table 2). Boat anglers spent 35,300 hours fishing (Table 3). Peak month of activity was July.

Seventeen species of fish and two species of crabs were identified in the boat anglers' catch (Table 4). Dungeness crab was the principal species taken and accounted for 75% of the total number of animals caught. Major catches occurred from June through August (Table 5). Fishing success (catch per hour) was highest during May.

### **Shore Fishery**

Interview data revealed that 5,500 shore angler trips were expended on Netarts Bay (Table 6). The county ramp was the principal fishing area; 76% of the anglers fished there. Shore anglers spent 9,600 hours fishing (Table 7). Peak activity was in July.

Eighteen species of fish and two species of crabs were identified in the shore anglers' catch (Table 8). Kelp greenling and black rockfish were the principal species taken, accounting for 61% of the total number of animals caught. Catch and fishing success were highest in July when there was a six-fold increase in the number of kelp greenling landed (Table 9).

### **Tideflat Fishery**

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

Table 10 shows that 14,600 tideflat user trips were expended to harvest clams and miscellaneous invertebrates from Netarts Bay. Tideflat users spent 19,300 hours collecting these animals (Table 11). Peak month of activity was July. Major digging effort (44%) was in the park spit area where 6,500 user trips, representing 8,700 user hours, were expended.

Eleven species of clams and eleven species of miscellaneous invertebrates were harvested by tideflat users (Table 12). Gaper (called blue clam in Tillamook County), cockle, and butter clams were the principal species collected, accounting for 84% of the total number of clams dug. The park spit was the principal area of catch, providing 119,700 animals or 46% of the harvest. Of this total 115,800 or 97% were clams.

### **Scuba Fishery**

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

### **Angler Origin**

Approximately 75% of the anglers interviewed were residents of Oregon living outside of Tillamook County, 18% were Tillamook County residents, and 8% were out-of-state residents.



	Angler Origin		
	County	State	Non-State
Boat	1,380	8,731	550
Shore	1,269	3,685	543
Tideflat	2,765	10,610	1,258
Total	5,414	23,026	2,351
Percentage	17.6	74.8	7.6

### Combined Recreational Fisheries

A total of 30,800 resource user trips (10,700 boat, 5,500 shore, and 14,600 tideflat) were expended on Netarts Bay during the study (Table 14). The 30,800 user trips represented 64,100 hours of effort (35,300 boat, 9,500 shore, and 19,300 tideflat). Peak activity occurred in July for all three fisheries. Areas receiving principal use for shore and tideflat fisheries were county ramp (76%), and park spit (44%), respectively. The estuary was not divided into different boat fishing areas.

Anglers of the three fisheries harvested 292,600 animals (232,900 clams, 28,000 miscellaneous invertebrates, 23,800 crabs, and 7,900 fish). Dungeness crab comprised 75% of the boat anglers' total catch. Fish represented 95% of the shore anglers' catch with kelp greenling the main species caught. Clams comprised 89% of the tideflat users' total take. Gaper and cockle clams were the principal species dug making up 37 and 29% of the clam harvest, respectively. Mud shrimp was the principal species of miscellaneous invertebrates collected by the tideflat users. Comparing the catch for all three fisheries revealed tideflat users harvested 261,500 or 89% of the total animals taken. Boat and shore anglers caught 25,200 and 6,000 marine animals, respectively.

### Commercial Fishery

Commercial landings of shellfish caught in Netarts Bay in 1971 totaled 23,359 pounds valued at \$5,272 (fisherman's level) according to Fish Commission landing statistics. Dungeness crab was the principal species harvested.

Species	Pounds	Value
Dungeness crab	21,761	\$5,000
Bay clams	1,598	272
Total	23,359	\$5,272

### Eel Grass Beds

Eel grass beds are found scattered throughout Netarts 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 Area

Oysters are grown commercially in Netarts Bay. Figure 6 shows the commercial oyster leases, totaling 82 acres. An estimated 1,500 acres are considered suitable for oyster culture.

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

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

Estuaries are some of the most productive lands on earth. 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.

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.

Fish feeding areas of the bay (for finfish and shellfish) include all areas of the estuary under tidal influence. Tidelands 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.

Fish and shellfish typically found associated with the bay tidelands include flounder, sole, perch, rockfish, salmon, crabs, shrimp, and clams. These same species reside in the estuary channels; period of residency is dependent on species, season, and location. A taxonomic list of species of marine animals observed in this study is contained in Table 16.

Rocky areas in the bay are the preferred feeding and rearing areas of perch, rockfish, greenling, and cabezon. These fish reside near the rock groins and Tillamook County boat basin 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 Netarts 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.

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 tidelands to reach their destination.

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

## **ACKNOWLEDGMENTS**

Many Fish Commission of Oregon personnel contributed in the gathering, compiling, analyzing of data, typing, and editing of this report. Special thanks are due Mrs. Linda Karlik for preparing the resource maps and Mr. Louis Fredd for his assistance in analyzing the data.

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

<b>Fishing Activity</b>	<b>Station Number</b>	<b>Location</b>
Boat	B-1	Entire Estuary (Mouth of estuary to head of tide)
Shore	S-1	Happy Camp
	S-2	County Ramp
	S-3	Wilson Beach - Whiskey Creek
Tideflat	T-1	Happy Camp
	T-2	Wilson Beach
	T-3	Whiskey Creek
	T-4	Park Spit
	T-5	Boat Ramp

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

<b>Month</b>	<b>Boat Fishing Area and Station Number</b>		<b>Percentage</b>
	<b>Entire Estuary Total (B-1 Only Station)</b>		
March	449		4.2
April	570		5.3
May	1,674		15.7
June	1,400		13.1
July	2,667		25.0
August	2,341		22.0
September	1,183		11.1
October	377		3.5
<b>Total</b>	<b>10,661</b>		<b>99.9</b>

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

Month	Boat Fishing Area and Station Number	
	Entire Estuary Total (B-1 Only Station)	Percentage
March	1,278	3.6
April	1,821	5.2
May	5,024	14.2
June	4,844	13.7
July	9,567	27.1
August	7,288	20.7
September	4,143	11.7
October	1,318	3.7
Total	35,283	99.9

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

Species	Boat Fishing Area and Station Number	
	Entire Estuary Total (B-1 Only Station)	Percentage
Dungeness crab	18,971	75.2
Red rock crab	4,034	16.0
Striped seaperch	688	2.7
Pile perch	527	2.1
White seaperch	304	1.2
Redtail surfperch	217	0.9
Kelp greenling	165	0.7
Walleye surfperch	158	0.6
Starry flounder	34	0.1
Copper rockfish	32	0.1
Pacific staghorn sculpin	20	0.1
Jacksmelt	18	0.1
Black rockfish	12	0.1
Buffalo sculpin	11	< 0.1
Cabezon	5	< 0.1
Lingcod	5	< 0.1
Silver surfperch	5	< 0.1
Cutthroat trout	4	< 0.1
Sand sole	3	< 0.1
Unidentified fish	11	< 0.1
Total	25,224	99.9

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

	March	April	May	June	July	August	Sept.	Oct.	Total	Percentage
Angler trips (number)	449	570	1,674	1,400	2,667	2,341	1,183	377	10,661	—
Fishing effort (hours)	1,278	1,821	5,024	4,844	9,567	7,288	4,143	1,318	35,283	—
Fishing success (catch/hr.)	0.75	0.72	0.55	1.11	0.72	0.68	0.55	0.54	0.71	—
Catch (number)										
Dungeness crab	873	1,236	2,269	3,979	5,399	3,278	1,256	681	18,971	75.2
Red rock crab	83	76	273	709	901	1,074	900	18	4,034	16.0
Striped seaperch	0	0	51	217	241	126	53	0	688	2.7
Pile perch	0	0	29	193	80	213	12	0	527	2.1
White seaperch	0	0	14	56	80	142	12	0	304	1.2
Redtail surfperch	0	0	66	146	5	0	0	0	217	0.9
Kelp greenling	0	0	47	0	51	43	24	0	165	0.7
Walleye surfperch	0	0	0	37	22	93	4	2	153	0.6
Starry flounder	0	3	7	9	5	10	0	0	34	0.1
Copper rockfish	0	0	0	0	22	0	0	10	32	0.1
Pacific staghorn sculpin	0	0	0	4	11	5	0	0	20	0.1
Jacksmelt	0	0	0	18	0	0	0	0	18	0.1
Black rockfish.	0	0	7	0	5	0	0	0	12	0.1
Buffalo sculpin	0	0	0	0	11	0	0	0	11	< 0.1
Cabezon	0	0	0	0	5	0	0	0	5	< 0.1
Lingcod	0	0	0	0	0	5	0	0	5	< 0.1
Silver surfperch	0	0	0	0	5	0	0	0	5	< 0.1
Cutthroat trout	0	0	0	4	0	0	0	0	4	< 0.1
Sand sole	0	0	3	0	0	0	0	0	3	< 0.1
Unidentified fish	0	0	0	0	11	0	0	0	11	< 0.1
Total	956	1,315	2,766	5,372	6,854	4,989	2,261	711	25,224	99.9
Percentage	3.8	5.2	11.0	21.3	27.2	19.8	9.0	2.8	100.1	

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

Month	Shore Fishing Area and Station Number			Total	Percentage
	Happy Camp S-1	County Ramp S-2	Wilson Beach Whiskey Creek S-3		
March	14	216	3	233	4.2
April	10	321	9	340	6.2
May	42	240	160	442	8.0
June	0	731	188	919	16.7
July	2	1,236	432	1,670	30.4
August	36	836	216	1,088	19.8
September	0	370	202	572	10.4
October	0	214	19	233	4.2
Total	104	4,164	1,229	5,497	99.9
Percentage	1.9	75.7	22.4	100.0	

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

Month	Shore Fishing Area and Station Number			Total	Percentage
	Happy Camp S-1	County Ramp S-2	Wilson Beach Whiskey Creek S-3		
March	26	385	5	416	4.4
April	18	560	16	594	6.2
May	74	424	283	781	8.2
June	0	1,253	322	1,575	16.5
July	3	2,149	752	2,904	30.4
August	61	1,424	369	1,854	19.4
September	0	660	360	1,020	10.7
October	1	380	34	415	4.3
Total	183	7,235	2,141	9,559	100.1
Percentage	1.9	75.7	22.4	100.0	

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

Species	Shore Fishing Area and Station Number			Total	Percentage
	Happy Camp S-1	County Ramp S-2	Wilson Beach Whiskey Creek S-3		
Red rock crab	0	266	0	266	4.5
Dungeness crab	11	0	0	11	0.2
Kelp greenling	0	2,371	612	2,983	50.1
Black rockfish	0	410	260	670	11.3
Striped seaperch	0	175	306	481	8.1
Shiner perch	0	186	219	405	6.8
Copper rockfish	0	109	153	262	4.4
Pacific staghorn sculpin	0	132	49	181	3.0
Pile perch	0	69	104	173	2.9
Cabazon	0	121	15	136	2.3
Walleye surfperch	0	24	100	124	2.1
Silver surfperch	0	0	68	68	1.1
Redtail surfperch	14	3	37	54	0.9
Buffalo sculpin	0	37	14	51	0.9
Red Irish lord	0	18	0	18	0.3
Starry flounder	5	13	0	18	0.3
Rock greenling	0	18	0	18	0.3
White seaperch	0	0	16	16	0.3
Jacksmelt	0	14	0	14	0.2
Coho salmon (adult)	0	3	0	3	0.1
Total	30	3,969	1,953	5,952	100.1
Percentage	0.5	66.7	32.8	100.0	

**Table 9. SHORE FISHING DATA**  
**Netarts Bay, All Areas**  
**1971**

	March	April	May	June	July	August	Sept.	Oct.	Total	Percentage
Angler trips (number)	233	340	442	919	1,670	1,088	572	233	5,497	—
Fishing effort (hours)	416	594	781	1,575	2,904	1,854	1,020	415	9,559	—
Fishing success (catch/hr.)	0.41	0.51	0.50	0.46	0.87	0.55	0.63	0.42	0.62	—
Catch (number)										
Red rock crab	0	4	0	0	190	72	0	0	266	4.5
Dungeness crab	0	0	11	0	0	0	0	0	11	0.2
Kelp greenling	144	253	176	226	1,456	319	332	77	2,983	50.1
Black rockfish	4	0	11	226	236	144	18	31	670	11.3
Striped seaperch	0	8	148	45	136	28	103	13	481	8.1
Shiner perch	0	0	0	9	114	210	65	7	405	6.8
Copper rockfish	4	0	17	90	83	65	0	3	262	4.4
Pacific staghorn sculpin	0	0	0	18	37	108	18	0	181	3.0
Pile perch	0	16	5	18	68	35	28	3	173	2.9
Cabezon	4	4	11	54	37	0	9	17	136	2.3
Walleye surfperch	0	0	0	0	75	28	18	3	124	2.1
Silver surfperch	0	0	0	0	68	0	0	0	68	1.1
Redtail surfperch	14	0	0	0	0	0	37	3	54	0.9
Buffalo sculpin	0	8	5	9	15	0	0	14	51	0.9
Red Irish lord	0	0	0	18	0	0	0	0	18	0.3
Starry flounder	0	8	10	0	0	0	0	0	18	0.3
Rock greenling	0	0	0	0	0	0	18	0	18	0.3
White seaperch	0	0	0	9	7	0	0	0	16	0.3
Jacksmelt	0	0	0	0	0	14	0	0	14	0.2
Coho salmon (adult)	0	0	0	0	0	0	0	3	3	0.1
<b>Total</b>	<b>170</b>	<b>301</b>	<b>394</b>	<b>722</b>	<b>2,522</b>	<b>1,023</b>	<b>646</b>	<b>174</b>	<b>5,952</b>	<b>100.1</b>
<b>Percentage</b>	<b>2.9</b>	<b>5.1</b>	<b>6.6</b>	<b>12.1</b>	<b>42.4</b>	<b>17.2</b>	<b>10.9</b>	<b>2.9</b>	<b>100.1</b>	



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

Month	Tideflat and Station Number					Total	Percentage
	Happy Camp T-1	Wilson Beach T-2	Whiskey Creek T-3	Park Spit T-4	Boat Ramp T-5		
March	406	181	99	358	0	1,044	7.1
April	396	304	26	1,015	0	1,741	11.9
May	138	178	37	917	4	1,274	8.7
June	1,081	239	238	1,207	4	2,769	18.9
July	1,494	458	240	1,404	23	3,619	24.7
August	1,121	216	512	1,182	4	3,035	20.7
September	470	131	146	390	3	1,140	7.8
October	0	0	0	0	11	11	0.1
Total	5,106	1,707	1,298	6,473	49	14,633	99.9
Percentage	34.9	11.7	8.9	44.2	0.3	100.0	

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

Month	Tideflat and Station Number					Total	Percentage
	Happy Camp T-1	Wilson Beach T-2	Whiskey Creek T-3	Park Spit T-4	Boat Ramp T-5		
March	443	197	108	421	0	1,169	6.1
April	586	450	38	1,501	0	2,575	13.3
May	258	364	65	1,691	8	2,386	12.3
June	1,273	290	257	1,343	7	3,170	16.4
July	1,884	558	291	1,662	26	4,421	22.9
August	1,630	330	710	1,598	5	4,273	22.1
September	539	159	164	440	3	1,305	6.8
October	0	0	0	0	5	5	<0.1
Total	6,613	2,348	1,633	8,656	54	19,304	99.9
Percentage	34.3	12.2	8.5	44.8	0.3	100.1	

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

Species	Tideflat and Station Number					Total	Percentage
	Happy Camp T-1	Wilson Beach T-2	Whiskey Creek T-3	Park Spit T-4	Boat Ramp T-5		
Gaper clam	81,551	4,998	959	10,260	0	97,768	37.4
Cockle clam	810	6,972	15,567	51,481	0	74,830	28.6
Butter clam	2,200	363	309	44,488	0	47,360	18.1
Native littleneck clam	665	1,684	178	7,959	0	10,486	4.0
Softshell clam	0	275	448	1,100	0	1,823	0.7
Razor clam	0	43	0	392	0	435	0.2
Piddock clam	0	61	0	0	0	61	<0.1
Sand clam	0	2	4	55	0	61	<0.1
Bentnose clam	0	11	7	38	0	56	<0.1
Manila littleneck clam	0	0	0	34	0	34	<0.1
Bodega tellen clam	4	0	13	4	0	21	<0.1
Mud shrimp	487	9,622	4,845	905	0	15,859	6.1
Ghost shrimp	737	3,475	164	2,458	2,982	9,816	3.8
Kelp worm	72	407	100	37	0	616	0.2
Red rock crab	271	35	32	0	0	338	0.1
Sea star	135	6	0	7	0	148	<0.1
Dungeness crab	32	17	4	57	0	110	<0.1
Shore crab	30	76	0	0	0	106	<0.1
Barnacle	0	0	0	32	0	32	<0.1
Bay mussel	8	0	0	20	0	28	<0.1
Hermit crab	4	0	4	9	0	17	<0.1
Sea mussel	0	0	0	4	0	4	<0.1
Unidentified invertebrates	112	856	156	331	0	1,455	0.6
<b>Total</b>	<b>87,118</b>	<b>28,903</b>	<b>22,790</b>	<b>119,671</b>	<b>2,982</b>	<b>261,464</b>	<b>99.8</b>
<b>Percentage</b>	<b>33.3</b>	<b>11.1</b>	<b>8.7</b>	<b>45.8</b>	<b>1.1</b>	<b>100.0</b>	

Table 13. TIDEFLAT FISHING DATA  
Netarts Bay, All Areas  
1971

	March	April	May	June	July	August	Sept.	Oct.	Total	Percentage
Angler trips (number)	1,044	1,741	1,274	2,769	3,619	3,035	1,140	11	14,633	—
Fishing effort (hours)	1,169	2,575	2,386	3,170	4,421	4,273	1,305	5	19,304	—
Fishing success (catch/hr.)	9.7	11.2	11.7	14.9	16.3	13.7	12.2	0.0	13.5	—
Catch (number)										
Gaper clam	4,393	9,147	4,917	19,292	32,296	21,107	6,616	0	97,768	37.4
Cockle clam	3,732	7,244	8,250	13,602	13,726	22,872	5,404	0	74,830	28.6
Butter clam	2,378	9,224	9,741	6,585	12,276	6,506	650	0	47,360	18.1
Native littleneck clam	399	1,904	1,947	1,974	2,277	1,840	145	0	10,486	4.0
Softshell clam	12	116	473	127	440	381	274	0	1,823	0.7
Razor clam	0	7	91	235	98	4	0	0	435	0.2
Piddock clam	0	46	15	0	0	0	0	0	61	< 0.1
Sand clam	18	3	20	6	4	8	2	0	61	< 0.1
Bentnose clam	0	10	7	16	8	8	7	0	56	< 0.1
Manila littleneck clam	0	0	0	34	0	0	0	0	34	< 0.1
Bodega tellen clam	0	0	0	3	12	4	2	0	21	< 0.1
Mud shrimp	0	0	1,692	2,906	5,144	4,193	1,924	0	15,859	6.1
Ghost shrimp	0	472	457	2,016	5,369	818	684	0	9,816	3.8
Kelp worm	3	3	12	67	84	323	124	0	616	0.2
Red rock crab	0	7	5	26	48	250	2	0	338	0.1
Sea star	0	7	2	79	17	8	35	0	148	< 0.1
Dungeness crab	12	3	40	3	30	18	4	0	110	< 0.1
Shore crab	0	0	76	0	26	4	0	0	106	< 0.1
Barnacle	0	0	0	0	8	24	0	0	32	< 0.1
Bay mussel	0	0	7	13	8	0	0	0	28	< 0.1
Hermit crab	0	0	0	0	0	17	0	0	17	< 0.1
Sea mussel	0	0	0	0	0	4	0	0	4	< 0.1
Unidentified invertebrates	384	638	92	98	125	89	29	0	1,455	0.6
Total	11,331	28,831	27,844	47,082	71,996	58,478	15,902	0	261,464	99.8
Percentage	4.3	11.0	10.6	18.0	27.5	22.4	6.1	0.0	99.9	

**Table 14. SUMMARY**  
**Number of Angler Trips, Hours of Effort, and Animals Caught**  
**Netarts Bay, By Station**  
**March 1 through October 31, 1971**

Station Number	No. Angler Trips	Angler Hours	Catch				Total
			Fish	Crabs	Clams	Misc. Invert.	
B-1	10,661	35,283	2,219	23,005	0	0	25,224
Total	10,661	35,283	2,219	23,005	0	0	25,224
S-1	104	183	19	11	0	0	30
S-2	4,164	7,235	3,703	266	0	0	3,969
S-3	1,229	2,141	1,953	0	0	0	1,953
Total	5,497	9,559	5,675	277	0	0	5,952
T-1	5,106	6,613	0	337	85,230	1,551	87,118
T-2	1,707	2,348	0	128	14,409	14,366	28,903
T-3	1,298	1,633	0	40	17,485	5,265	22,790
T-4	6,473	8,656	0	66	115,811	3,794	119,671
T-5	49	54	0	0	0	2,982	2,982
Total	14,633	19,304	0	571	232,935	27,958	261,464
Grand Total	30,791	64,146	7,894	23,853	232,935	27,958	292,640

**Table 15. SUMMARY**  
**Number of Angler Trips, Hours of Effort, and Animals Caught**  
**Netarts Bay, by Month**  
**March 1 through October 31, 1971**

Fishery	Month	No. Angler Trips	Angler Hours	Catch				Total
				Fish	Crabs	Clams	Misc. Invert.	
Boat	March	449	1,278	0	956	0	0	956
	April	570	1,821	3	1,312	0	0	1,315
	May	1,674	5,024	224	2,542	0	0	2,766
	June	1,400	4,844	684	4,688	0	0	5,372
	July	2,667	9,567	554	6,300	0	0	6,854
	August	2,341	7,288	637	4,352	0	0	4,989
	September	1,183	4,143	105	2,156	0	0	2,261
	October	377	1,318	12	699	0	0	711
	<b>Total</b>	<b>10,661</b>	<b>35,283</b>	<b>2,219</b>	<b>23,005</b>	<b>0</b>	<b>0</b>	<b>25,224</b>
Shore	March	233	416	170	0	0	0	170
	April	340	594	297	4	0	0	301
	May	442	781	383	11	0	0	394
	June	919	1,575	722	0	0	0	722
	July	1,670	2,904	2,332	190	0	0	2,522
	August	1,088	1,854	951	72	0	0	1,023
	September	572	1,020	646	0	0	0	646
	October	233	415	174	0	0	0	174
	<b>Total</b>	<b>5,497</b>	<b>9,559</b>	<b>5,675</b>	<b>277</b>	<b>0</b>	<b>0</b>	<b>5,952</b>
Tideflat	March	1,044	1,169	0	12	10,932	387	11,331
	April	1,741	2,575	0	10	27,701	1,120	28,831
	May	1,274	2,386	0	121	25,461	2,262	27,844
	June	2,769	3,170	0	29	41,874	5,179	47,082
	July	3,619	4,421	0	104	61,137	10,755	71,996
	August	3,035	4,273	0	289	52,730	5,459	58,478
	September	1,140	1,305	0	6	13,100	2,796	15,902
	October	11	5	0	0	0	0	0
	<b>Total</b>	<b>14,633</b>	<b>19,304</b>	<b>0</b>	<b>571</b>	<b>232,935</b>	<b>27,958</b>	<b>261,464</b>
Combined	March	1,726	2,863	170	968	10,932	387	12,457
	April	2,651	4,990	300	1,326	27,701	1,120	30,447
	May	3,390	8,191	607	2,674	25,461	2,262	31,004
	June	5,088	9,589	1,406	4,717	41,874	5,179	53,176
	July	7,956	16,892	2,886	6,594	61,137	10,755	81,372
	August	6,464	13,415	1,588	4,713	52,730	5,459	64,490
	September	2,895	6,468	751	2,162	13,100	2,796	18,809
	October	621	1,738	186	699	0	0	885
	<b>Grand Total</b>	<b>30,791</b>	<b>64,146</b>	<b>7,894</b>	<b>23,853</b>	<b>232,935</b>	<b>27,958</b>	<b>292,640</b>

**Table 16. TAXONOMIC LIST OF SPECIES HARVESTED  
By Estuarine Resource Users, Netarts 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>
Buffalo sculpin	Bullhead	<i>Enophrys bison</i>
Cabezon	Rock cod, bullhead	<i>Scorpaenichthys marmoratus</i>
Coho salmon	Silver salmon	<i>Oncorhynchus kisutch</i>
Copper rockfish	Red snapper, bass	<i>Sebastes caurinus</i>
Cutthroat trout	Blueback, harvest trout, sea run	<i>Salmo clarki</i>
Jacksmelt		<i>Atherinopsis californiensis</i>
Kelp greenling	Seatrout	<i>Hexagrammos decagrammus</i>
Lingcod		<i>Ophiodon elongatus</i>
Pacific staghorn sculpin	Bullhead	<i>Leptocottus armatus</i>
Pile perch		<i>Rhacochilus vacca</i>
Red Irish lord	Bullhead	<i>Hemilepidotus hemilepidotus</i>
Redtail surfperch		<i>Amphistichus rhodoterus</i>
Rock greenling	Seatrout	<i>Hexagrammos lagocephalus</i>
Sand sole		<i>Psettichthys melanostictus</i>
Shiner perch	Shiner	<i>Cymatogaster aggregata</i>
Silver surfperch		<i>Hyperprosopon ellipticum</i>
Starry flounder		<i>Platichthys stellatus</i>
Striped seaperch	Rainbow perch	<i>Embiotoca lateralis</i>
Walleye surfperch		<i>Hyperprosopon argenteum</i>
White seaperch		<i>Phanerodon furcatus</i>
<b>Crabs</b>		
Dungeness crab	Market crab	<i>Cancer magister</i>
Hermit crab		<i>Pagurus sp.</i>
Red rock crab	Japanese crab, rock crab	<i>Cancer productus</i>
Shore crab	Mud crab	<i>Hemigrapsus oregonensis</i> and <i>Hemigrapsus nudus</i>
<b>Clams</b>		
Bentnose clam		<i>Macoma nasuta</i>
Butter clam	Beef steak clam, Coney Island, giant Oregon clam, quahog, Washington clam	<i>Saxidomus giganteus</i>
Bodega tellen clam		<i>Tellina bodegensis</i>
Cockle clam	Basket cockle, steamer	<i>Clinocardium nuttallii</i>
Gaper clam	Blue clam, blueneck, Empire clam, horse clam, horseneck clam	<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>
Piddock clam	Rock oyster	<i>Zirfaea pilsbryi</i> and <i>Penitella</i> <i>penita</i>
Razor clam		<i>Siliqua patula</i>
Sand clam		<i>Macoma secta</i>
Softshell clam	Bay clam, mud clam	<i>Mya arenaria</i>
<b>Miscellaneous Invertebrates</b>		
Barnacle		<i>Balanus sp.</i> and <i>Pollicipes</i> <i>polymerus</i>
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>
Sea mussel		<i>Mytilus californianus</i>
Sea star	Starfish	<i>Pisaster ochraceous</i>

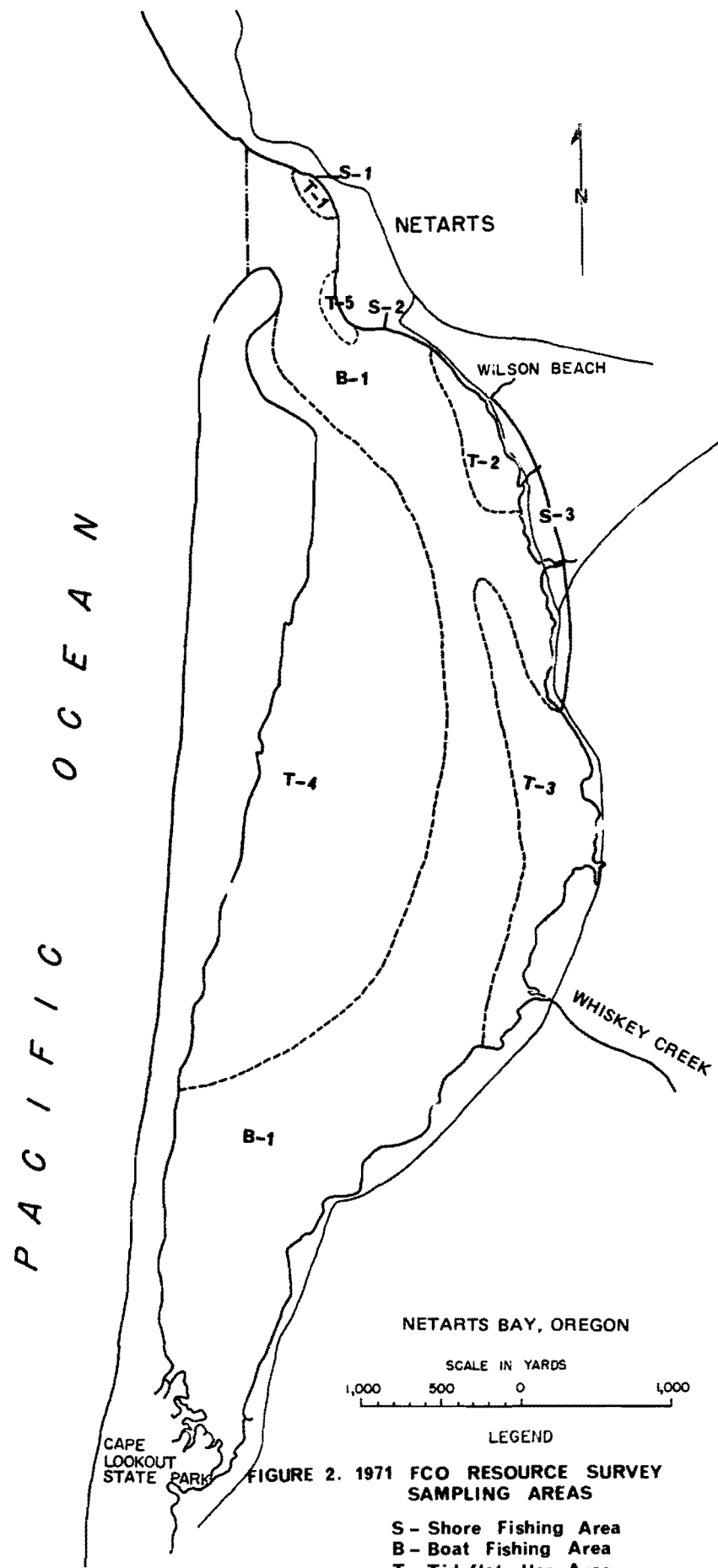


FIGURE 2. 1971 FCO RESOURCE SURVEY SAMPLING AREAS

