FISH COMMISSION OF OREGON

COQUILLE RIVER ESTUARY

A STUDY IN RESOURCE USE
DIVISION OF MANAGEMENT AND RESEARCH

1971 COQUILLE RIVER ESTUARY RESOURCE USE STUDY

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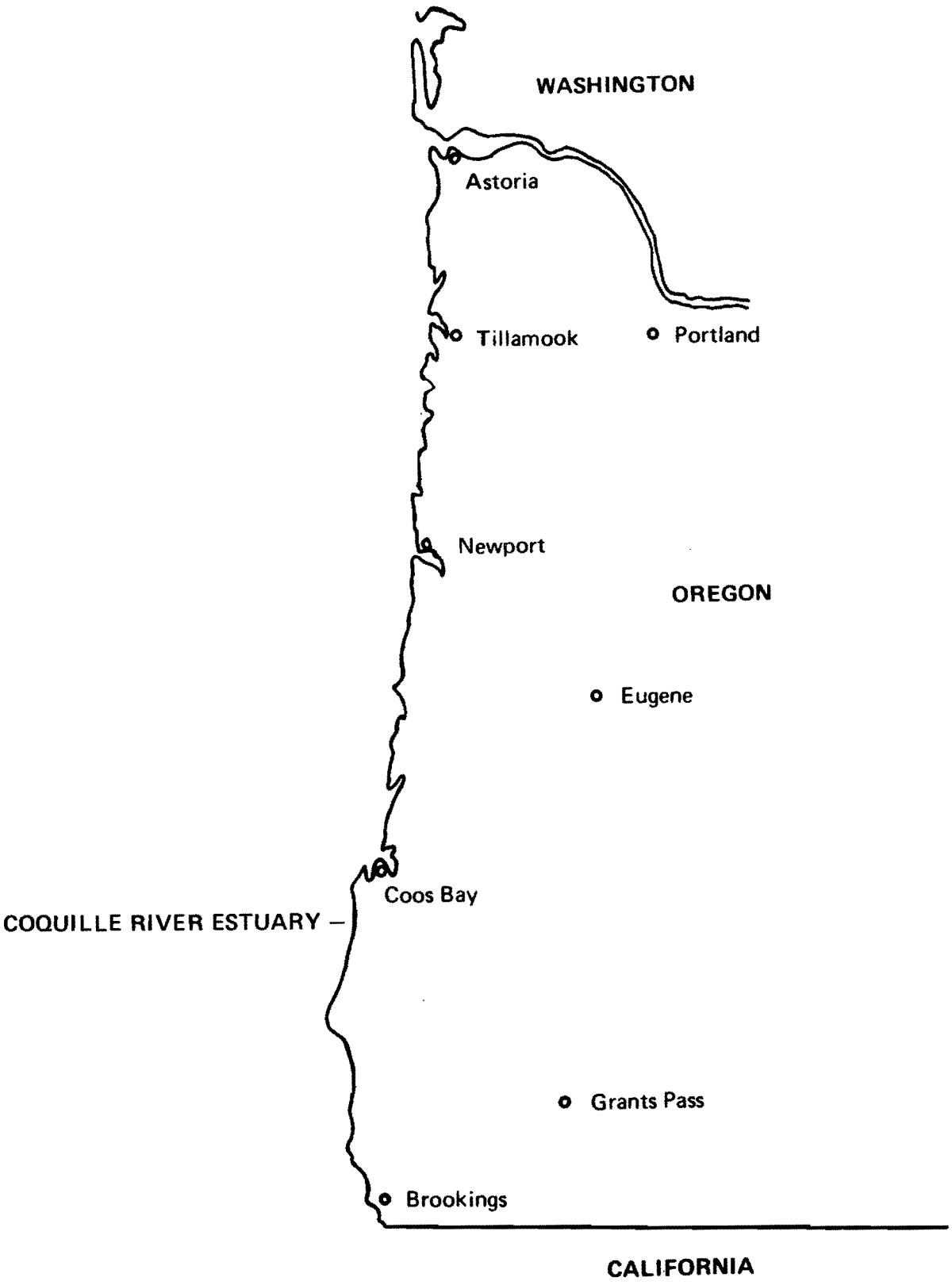

Figure 1. Location of Coquille River Estuary.

1971 COQUILLE RIVER ESTUARY 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 Coquille River Estuary study.

PROCEDURE

The Coquille River Estuary is located 290 miles south of the Columbia River (Figure 1). The 771-acre bay contains 301 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 extended from the seaward ends of the two jetties upstream 4 miles to the Highway 101 bridge. Survey areas and their station numbers are outlined in Table 1 and are shown in Figure 2.

The 1971 Coquille River Estuary commercial landings of fish and their value, taken from Fish Commission catch statistic reports, are included 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. Food production areas, fish feeding areas, and fish migration routes.

RESULTS

During the study 1,809 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 the Coquille River Estuary. 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 1,800 boat angler trips were expended on the estuary (Table 2). The boat anglers spent 5,000 hours fishing (Table 3). Peak activity was in August.

Five species of fish and one species of crab were identified in the boat anglers' catch (Table 4). Dungeness crab was the principal species taken and accounted for 91% of the total number of animals taken. The major catches occurred from June through August (Table 5). Fishing success (catch per hour) was highest during June.

Shore Fishery

Interview data revealed that 11,700 shore angler trips were expended on the Coquille River Estuary (Table 6). The city docks and the north jetty were the principal fishing areas; 69% of the anglers fished there. Shore anglers spent 25,100 hours fishing (Table 7). July was the peak month of activity.

Twenty species of fish and two species of crabs were identified in the shore anglers' catch (Table 8). Surf smelt and redtail surfperch were the principal species taken, accounting for 85% of the total number of animals caught. Catch and fishing success were highest in July when surf smelt entered the estuary (Table 9).

Tideflat Fishery

Figure 4 shows the distribution of bay clams in the Coquille River Estuary. Gaper clams are found in the intertidal and subtidal zones of the lower bay. Softshell clams are found scattered throughout the lower bay up to the Highway 101 bridge. The principal area of digging is outlined on the map in Figure 4.

Table 10 shows that 170 tideflat user trips were expended to harvest clams and mussels from the estuary. Tideflat users spent 200 hours collecting these animals (Table 11). Peak activity was in March. The major digging effort (49%) was in the treatment plant area where 82 user trips, representing 95 user hours, were expended.

Two species of clams and one species of mussel were harvested by tideflat users (Table 12). Softshell clams accounted for over 99% of the animals dug. The treatment plant area was the principal area of catch, providing 1,400 clams or 54% of the harvest.

Scuba Fishery

The small number of scuba divers interviewed on the Coquille River Estuary precluded making an estimate of catch and effort for this fishery.

Angler Origin

Over half (53%) of the anglers interviewed were residents of Coos County, 35% were Oregon residents from outside Coos County, and 12% were out-of-state residents.

	Angler Origin		
	County	State	Non-State
Boat	1,051	618	86
Shore	5,995	4,187	1,549
Tideflat	144	21	4
Total	**7,190**	**4,826**	**1,639**
Percentage	**52.7**	**35.3**	**12.0**

Combined Recreational Fisheries

A total of 13,700 resource user trips (1,800 boat, 11,700 shore, and 200 tideflat) were expended on the Coquille River Estuary during the study (Table 14). The 13,700 user trips represented 30,300 hours of effort (5,000 boat, 25,100 shore, and 200 tideflat). Peak activity for the boat, shore and tideflat fisheries was in August, July, and March, respectively. Combining all fisheries, Table 15 shows that July was the peak month of activity. Areas receiving the principal use for boat, shore, and tideflat fisheries were below Highway 101 bridge (100%), city docks (35%), and treatment plant (49%), respectively.

Anglers of the three fisheries harvested 67,600 animals (62,000 fish, 3,000 crabs, and 2,600 clams). Dungeness crab comprised 91% of the boat anglers' total catch. Fish were the principal animals harvested by shore anglers and represented 99% of their total catch. Surf smelt was the main species caught. Softshell clams comprised over 99% of the tideflat users' total take. Comparing the catch for all three fisheries revealed that shore anglers harvested 62,500 or 92% of the total animals taken. Boat anglers and tideflat users each caught 2,600 marine animals. Peak catch for the boat, shore, and tideflat fisheries occurred in June, July and July, respectively. Combining all fisheries, July was the principal month of catch.

Commercial Fishery

Commercial landings of food fish caught in the Coquille River Estuary in 1971 totaled 14,022 pounds valued at $2,351 (fisherman's level) according to Fish Commission landing statistics. Shad was the principal species harvested.

Species	Pounds	Value
Shad	13,485	$2,292
Striped bass	537	59
Total	**14,022**	**$2,351**

Eel Grass Beds

Eel grass beds are found scattered along the east shore of the lower bay up to the Highway 101 bridge (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.

Food Production Areas, Fish Feeding Areas, and Fish Migration Routes

Figure 6 shows the food production areas, fish feeding areas, and fish migration routes in the Coquille River Estuary.

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 the Coquille River Estuary, the production of 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 the estuary (for finfish and shellfish) include all areas 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.

Fish and shellfish typically found associated with the tideflats include flounder, perch, salmon, crabs, shrimp, and clams. In addition to those species found on tideflats, striped bass, shad, and smelt reside in the estuary channels; period of residency is dependent on species, season, and location. A taxonomic list of the species of marine animals observed in this study is contained in Table 16.

Rocky areas in the estuary are the preferred feeding and rearing areas of perch, rockfish, greenling, and cabezon. These fish reside near the jetties 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 the Coquille River Estuary 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, striped bass, shad, perch, flounder, and baitfish is well known. In addition during high tide, these same fish frequently swim across tideflats to reach their destination.

Table 1. LOCATION OF SAMPLING STATIONS
Coquille River Estuary, 1971

Fishing Activity	Station Number	Location
Boat	B-1	Below Highway 101 bridge (Highway 101 bridge downstream to westward end of jetties)
Shore	S-1	South Jetty
	S-2	City Docks (Boat Basin - City Docks)
	S-3	North Spit (Bullards - North Spit)
	S-4	North Jetty
Tideflat	T-1	South Jetty
	T-2	Treatment Plant
	T-3	North Bay
	T-4	North Spit

Table 2. NUMBER OF BOAT ANGLER TRIPS
By Month and Area, Coquille River Estuary
March 1 through October 31, 1971

	Boat Fishing Area and Station Number Below Highway 101 Bridge	
Month	Total (B-1 Only Station)	Percentage
March	0	0.0
April	56	3.2
May	91	5.2
June	224	12.8
July	159	9.1
August	664	37.8
September	438	25.0
October	123	7.0
Total	1,755	100.1

Table 3. HOURS OF BOAT ANGLER USE
By Month and Area, Coquille River Estuary
March 1 through October 31, 1971

	Boat Fishing Area and Station Number Below Highway 101 Bridge	
Month	Total (B-1 Only Station)	Percentage
March	0	0.0
April	138	2.8
May	224	4.5
June	505	10.1
July	442	8.9
August	2,146	43.0
September	1,083	21.7
October	454	9.1
Total	4,992	100.1

Table 4. MARINE ANIMALS CAUGHT BY BOAT ANGLERS
Coquille River Estuary, By Species and Area
March 1 through October 31, 1971

Species	Boat Fishing Area and Station Number Below Highway 101 Bridge Total (B-1 Only Station)	Percentage
Dungeness crab	2,363	91.0
Coho salmon (adult)	90	3.5
Redtail surfperch	86	3.3
Chinook salmon (adult)	46	1.8
Striped seaperch	6	0.2
Lingcod	6	0.2
Total	2,597	100.0

Table 5. SPORT BOAT FISHING DATA
Coquille River Estuary, All Areas
1971

	March	April	May	June	July	Aug.	Sept.	Oct.	Total	Percentage
Angler trips (number)	0	56	91	224	159	664	438	123	1,755	–
Fishing effort (hours)	0	138	224	505	442	2,146	1,083	454	4,992	–
Fishing success (catch/hr.)	0.00	0.07	0.07	1.49	1.33	0.34	0.29	0.40	0.52	–
Catch (number)										
Dungeness crab	0	2	4	672	590	668	251	176	2,363	91.0
Coho salmon (adult)	0	0	0	0	0	27	58	5	90	3.5
Redtail surfperch	0	7	12	67	0	0	0	0	86	3.3
Chinook salmon (adult)	0	0	0	0	0	36	8	2	46	1.8
Striped seaperch	0	0	0	6	0	0	0	0	6	0.2
Lingcod	0	0	0	6	0	0	0	0	6	0.2
Total	0	9	16	751	590	731	317	183	2,597	100.0
Percentage	0.0	0.3	0.6	28.9	22.7	28.1	12.2	7.0	99.8	

Table 6. NUMBER OF SHORE ANGLER TRIPS
By Month and Area, Coquille River Estuary
March 1 through October 31, 1971

	Shore Fishing Area and Station Number					
Month	South Jetty S-1	City Docks S-2	North Spit S-3	North Jetty S-4	Total	Percentage
March	27	101	13	5	146	1.2
April	263	78	0	113	454	3.9
May	459	219	0	256	934	8.0
June	935	1,071	70	748	2,824	24.1
July	858	1,847	31	1,369	4,105	35.0
August	429	462	221	1,192	2,304	19.6
September	146	185	53	313	697	5.9
October	80	166	0	21	267	2.3
Total	3,197	4,129	388	4,017	11,731	100.0
Percentage	27.3	35.2	3.3	34.2	100.0	

Table 7. HOURS OF SHORE ANGLER USE
By Month and Area, Coquille River Estuary
March 1 through October 31, 1971

	Shore Fishing Area and Station Number					
Month	South Jetty S-1	City Docks S-2	North Spit S-3	North Jetty S-4	Total	Percentage
March	60	222	30	12	324	1.3
April	561	166	0	241	968	3.9
May	977	466	0	545	1,988	7.9
June	2,013	2,304	152	1,610	6,079	24.2
July	1,820	3,915	65	2,902	8,702	34.7
August	926	998	477	2,573	4,974	19.8
September	312	396	113	670	1,491	5.9
October	174	359	0	46	579	2.3
Total	6,843	8,826	837	8,599	25,105	100.0
Percentage	27.3	35.2	3.3	34.2	100.0	

Table 8. MARINE ANIMALS CAUGHT BY SHORE ANGLERS
Coquille River Estuary, By Species and Area
March 1 through October 31, 1971

Species	Shore Fishing Area and Station Number: South Jetty S-1	City Docks S-2	North Spit S-3	North Jetty S-4	Total	Percentage
Dungeness crab	0	646	0	9	655	1.0
Red rock crab	0	28	0	0	28	< 0.1
Surf smelt	934	41,182	0	0	42,116	67.4
Redtail surfperch	4,184	404	19	6,644	11,251	18.0
Shiner perch	67	2,544	19	28	2,658	4.3
Striped seaperch	965	387	0	399	1,751	2.8
Pacific staghorn sculpin	0	1,263	18	337	1,618	2.6
Pile perch	319	437	9	156	921	1.5
Starry flounder	44	9	0	282	335	0.5
Coho salmon (juvenile)	0	184	0	0	184	0.3
Kelp greenling	79	69	0	9	157	0.3
Silver surfperch	0	0	0	123	123	0.2
Coho salmon (adult)	9	0	9	49	67	0.1
Pacific tomcod	13	39	0	13	65	0.1
Whitespotted greenling	60	0	0	0	60	0.1
Lingcod	38	0	0	22	60	0.1
White seaperch	38	14	0	0	52	0.1
Rock greenling	24	0	0	19	43	0.1
Eulachon	0	28	0	0	28	< 0.1
Chinook salmon (adult)	9	0	0	18	27	< 0.1
Buffalo sculpin	14	0	0	0	14	< 0.1
Cabezon	0	0	0	9	9	< 0.1
Black rockfish	0	0	0	9	9	< 0.1
Unidentified fish	0	38	0	190	228	0.4
Total	6,797	47,272	74	8,316	62,459	99.9
Percentage	10.9	75.7	0.1	13.3	100.0	

Table 9. SHORE FISHING DATA
Coquille River Estuary, All Areas
1971

	March	April	May	June	July	Aug.	Sept.	Oct.	Total	Percentage
Angler trips (number)	146	454	934	2,824	4,105	2,304	697	267	11,731	–
Fishing effort (hours)	324	968	1,988	6,079	8,702	4,974	1,491	579	25,105	–
Fishing success (catch/hr.)	0.00	1.01	1.34	1.21	5.61	0.40	0.29	0.33	2.49	–
Catch (number)										
Dungeness crab	0	7	28	162	26	289	12	131	655	1.0
Red rock crab	0	0	0	0	0	28	0	0	28	< 0.1
Surf smelt	0	0	0	0	42,116	0	0	0	42,116	67.4
Redtail surfperch	0	654	2,167	3,758	3,800	774	60	38	11,251	18.0
Shiner perch	0	0	0	858	1,526	214	60	0	2,658	4.3
Striped seaperch	0	266	128	723	394	158	60	22	1,751	2.8
Pacific staghorn sculpin	0	15	28	924	394	185	72	0	1,618	2.6
Pile perch	0	0	85	437	262	101	36	0	921	1.5
Starry flounder	0	7	42	56	26	168	36	0	335	0.5
Coho salmon (juvenile)	0	0	0	0	184	0	0	0	184	0.3
Kelp greenling	0	15	43	75	0	0	24	0	157	0.3
Silver surfperch	0	0	114	9	0	0	0	0	123	0.2
Coho salmon (adult)	0	0	0	0	0	55	12	0	67	0.1
Pacific tomcod	0	0	0	0	65	0	0	0	65	0.1
Whitespotted greenling	0	0	0	0	0	0	60	0	60	0.1
Lingcod	0	0	0	47	13	0	0	0	60	0.1
White seaperch	0	0	14	38	0	0	0	0	52	0.1
Rock greenling	0	15	0	28	0	0	0	0	43	0.1
Eulachon	0	0	0	28	0	0	0	0	28	< 0.1
Chinook salmon (adult)	0	0	0	0	0	27	0	0	27	< 0.1
Buffalo sculpin	0	0	14	0	0	0	0	0	14	< 0.1
Cabezon	0	0	0	9	0	0	0	0	9	< 0.1
Black rockfish	0	0	0	9	0	0	0	0	9	< 0.1
Unidentified fish	0	0	0	219	0	9	0	0	228	0.4
Total	0	979	2,663	7,380	48,806	2,008	432	191	62,459	99.9
Percentage	0.0	1.6	4.3	11.8	78.1	3.2	0.7	0.3	100.0	

Table 10. NUMBER OF TIDEFLAT USER TRIPS
By Month and Area, Coquille River Estuary
March 1 through October 31, 1971

	Tideflat and Station Number					
Month	South Jetty T-1	Treatment Plant T-2	North Bay T-3	North Spit T-4	Total	Percentage
March	0	41	6	0	47	27.8
April	8	13	0	0	21	12.4
May	14	12	0	0	26	15.4
June	0	0	30	0	30	17.8
July	7	16	22	0	45	26.6
August	0	0	0	0	0	0.0
September	0	0	0	0	0	0.0
October	0	0	0	0	0	0.0
Total	29	82	58	0	169	100.0
Percentage	17.2	48.5	34.3	0.0	100.0	

Table 11. HOURS OF TIDEFLAT USE
By Month and Area, Coquille River Estuary
March 1 through October 31, 1971

	Tideflat and Station Number					
Month	South Jetty T-1	Treatment Plant T-2	North Bay T-3	North Spit T-4	Total	Percentage
March	0	55	9	0	64	30.3
April	5	8	0	0	13	6.2
May	5	5	0	0	10	4.7
June	1	0	48	0	49	23.2
July	12	27	36	0	75	35.5
August	0	0	0	0	0	0.0
September	0	0	0	0	0	0.0
October	0	0	0	0	0	0.0
Total	23	95	93	0	211	99.9
Percentage	10.9	45.0	44.1	0.0	100.0	

Table 12. MARINE ANIMALS CAUGHT BY TIDEFLAT USERS
Coquille River Estuary, by Species and Area
March 1 through October 31, 1971

Species	Tideflat and Station Number: South Jetty T-1	Treatment Plant T-2	North Bay T-3	North Spit T-4	Total	Percentage
Softshell clam	212	1,430	975	0	2,617	99.5
Gaper clam	0	0	5	0	5	0.2
Bay mussel	7	0	0	0	7	0.3
Total	219	1,430	980	0	2,629	100.0
Percentage	8.3	54.4	37.3	0.0	100.0	

Table 13. TIDEFLAT FISHING DATA
Coquille River Estuary, All Areas
1971

	March	April	May	June	July	Aug.	Sept.	Oct.	Total	Percentage
Angler trips (number)	47	21	26	30	45	0	0	0	169	——
Fishing effort (hours)	64	13	10	49	75	0	0	0	211	——
Fishing success (catch/hr.)	5.7	21.0	46.7	8.1	15.0	0.0	0.0	0.0	12.5	——
Catch (number)										
Softshell clam	367	266	467	392	1,125	0	0	0	2,617	99.5
Gaper clam	0	0	0	5	0	0	0	0	5	0.2
Bay mussel	0	7	0	0	0	0	0	0	7	0.3
Total	367	273	467	397	1,125	0	0	0	2,629	100.0
Percentage	13.9	10.4	17.8	15.1	42.8	0.0	0.0	0.0	100.0	

Table 14. SUMMARY
Number of Angler Trips, Hours of Effort, and Animals Caught
Coquille River Estuary, by Station
March 1 through October 31, 1971

Station Number	No. Angler Trips	Angler Hours	Catch				
			Fish	Crabs	Clams	Misc. Invert.	Total
B-1	1,755	4,992	234	2,363	0	0	2,597
Total	1,755	4,992	234	2,363	0	0	2,597
S-1	3,197	6,843	6,797	0	0	0	6,797
S-2	4,129	8,826	46,598	674	0	0	47,272
S-3	388	837	74	0	0	0	74
S-4	4,017	8,599	8,307	9	0	0	8,316
Total	11,731	25,105	61,776	683	0	0	62,459
T-1	29	23	0	0	212	7	219
T-2	82	95	0	0	1,430	0	1,430
T-3	58	93	0	0	980	0	980
T-4	0	0	0	0	0	0	0
Total	169	211	0	0	2,622	7	2,629
Grand Total	13,655	30,308	62,010	3,046	2,622	7	67,685

Table 15. SUMMARY
Number of Angler Trips, Hours of Effort, and Animals Caught
Coquille River Estuary, by Month
March 1 through October 31, 1971

Fishery	Month	No. Angler Trips	Angler Hours	Catch				
				Fish	Crabs	Clams	Misc. Invert.	Total
Boat	March	0	0	0	0	0	0	0
	April	56	138	7	2	0	0	9
	May	91	224	12	4	0	0	16
	June	224	505	79	672	0	0	751
	July	159	442	0	590	0	0	590
	August	664	2,146	63	668	0	0	731
	September	438	1,083	66	251	0	0	317
	October	123	454	7	176	0	0	183
	Total	1,755	4,992	234	2,363	0	0	2,597
Shore	March	146	324	0	0	0	0	0
	April	454	968	972	7	0	0	979
	May	934	1,988	2,635	28	0	0	2,663
	June	2,824	6,079	7,218	162	0	0	7,380
	July	4,105	8,702	48,780	26	0	0	48,806
	August	2,304	4,974	1,691	317	0	0	2,008
	September	697	1,491	420	12	0	0	432
	October	267	579	60	131	0	0	191
	Total	11,731	25,105	61,776	683	0	0	62,459
Tideflat	March	47	64	0	0	367	0	367
	April	21	13	0	0	266	7	273
	May	26	10	0	0	467	0	467
	June	30	49	0	0	397	0	397
	July	45	75	0	0	1,125	0	1,125
	August	0	0	0	0	0	0	0
	September	0	0	0	0	0	0	0
	October	0	0	0	0	0	0	0
	Total	169	211	0	0	2,622	7	2,629
Combined	March	193	388	0	0	367	0	367
	April	531	1,119	979	9	266	7	1,261
	May	1,051	2,222	2,647	32	467	0	3,146
	June	3,078	6,633	7,297	834	397	0	8,528
	July	4,309	9,219	48,780	616	1,125	0	50,521
	August	2,968	7,120	1,754	985	0	0	2,739
	September	1,135	2,574	486	263	0	0	749
	October	390	1,033	67	307	0	0	374
Grand Total		13,655	30,308	62,010	3,046	2,622	7	67,685

Table 16. TAXONOMIC LIST OF SPECIES HARVESTED
By Estuarine Resource Users, Coquille River Estuary
March 1 through October 31, 1971

Common Name	Local Names	Scientific Name
Fish		
Black rockfish	Black sea bass, black snapper	*Sebastes melanops*
Buffalo sculpin	Bullhead	*Enophrys bison*
Cabezon	Rock cod, bullhead	*Scorpaenichthys marmoratus*
Chinook salmon	King salmon, salmon	*Oncorhynchus tshawytscha*
Coho salmon	Silver salmon	*Oncorhynchus kisutch*
Eulachon	Candlefish	*Thaleichthys pacificus*
Kelp greenling	Seatrout	*Hexagrammos decagrammus*
Lingcod		*Ophiodon elongatus*
Pacific staghorn sculpin	Bullhead	*Leptocottus armatus*
Pacific tomcod		*Microgradus proximus*
Pile perch		*Rhacochilus vacca*
Redtail surfperch		*Amphistichus rhodoterus*
Rock greenling	Seatrout	*Hexagrammos lagocephalus*
Shiner perch	Shiner	*Cymatogaster aggregata*
Silver surfperch		*Hyperprosopon ellipticum*
Starry flounder		*Platichthys stellatus*
Striped seaperch	Rainbow perch	*Embiotoca lateralis*
Surf smelt		*Hypomesus pretiosus*
White seaperch		*Phanerodon furcatus*
Whitespotted greenling		*Hexagrammos stelleri*
Crabs		
Dungeness crab	Market crab	*Cancer magister*
Red rock crab	Japanese crab, rock crab	*Cancer productus*
Clams		
Gaper clam	Blue clam, Empire clam, horse clam, horseneck clam, blueneck	*Tresus capax*
Softshell clam	Mud clam, bay clam	*Mya arenaria*
Miscellaneous Invertebrates		
Bay mussel		*Mytilus edulis*

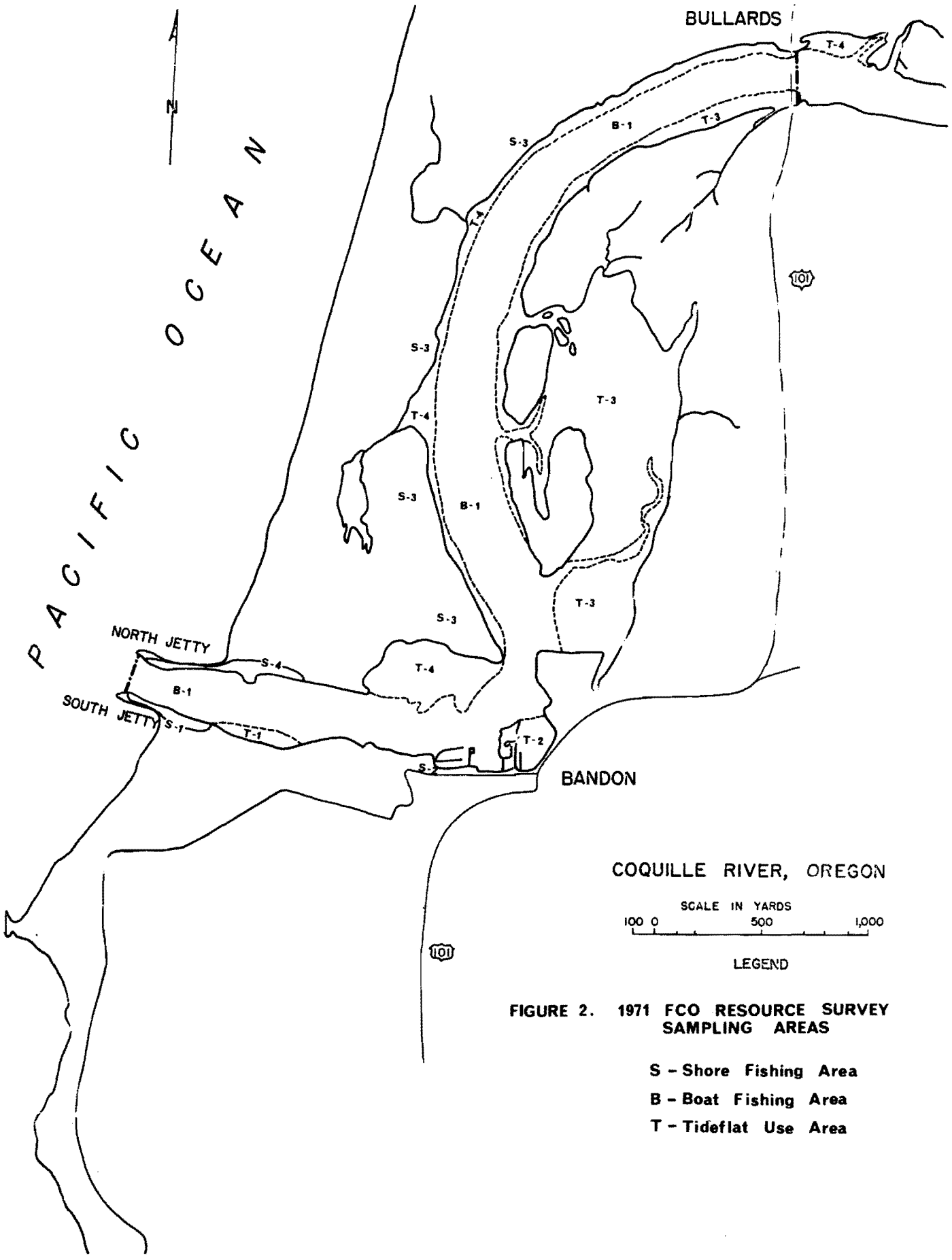

FIGURE 2. 1971 FCO RESOURCE SURVEY SAMPLING AREAS

S - Shore Fishing Area

B - Boat Fishing Area

T - Tideflat Use Area

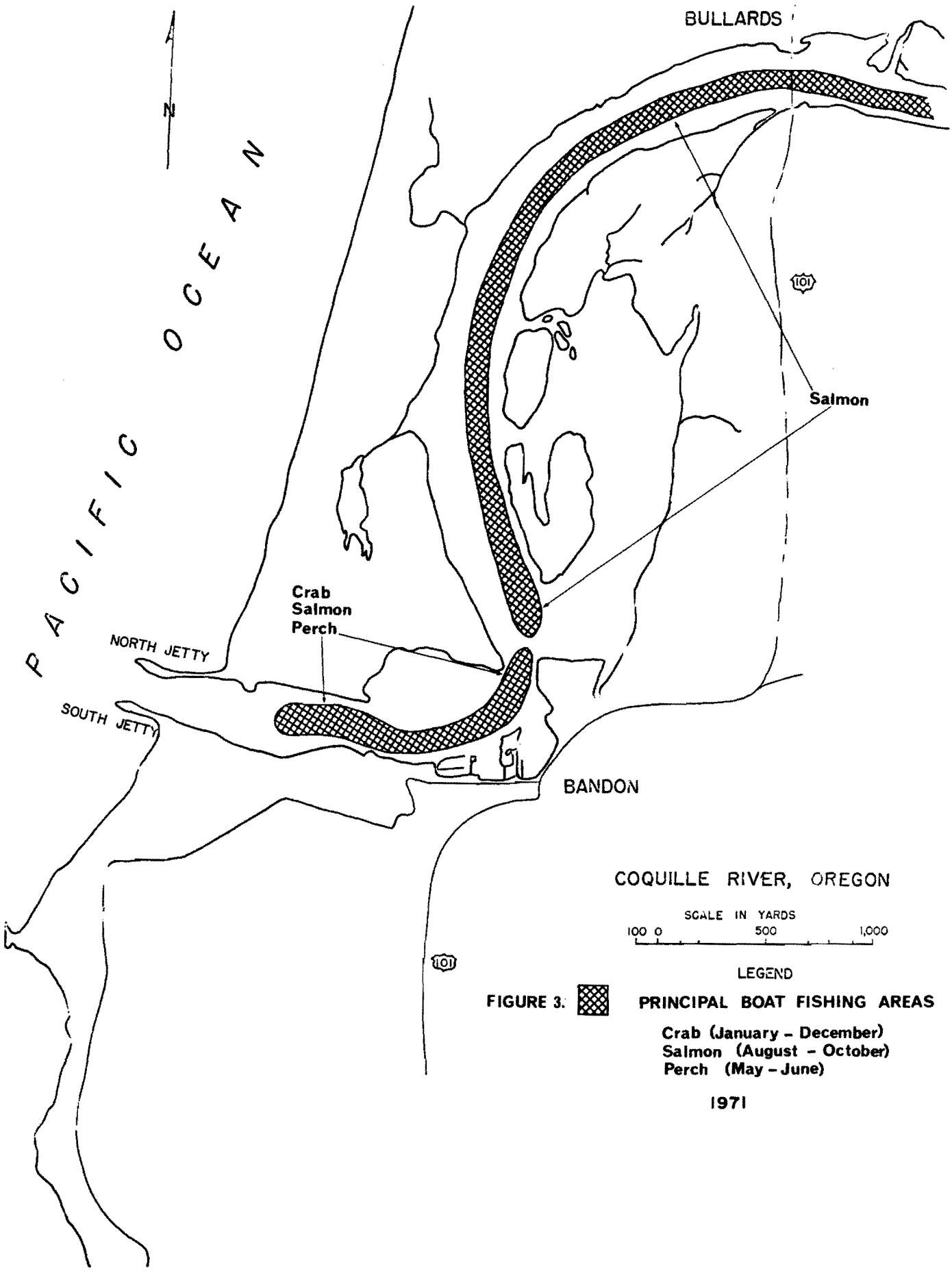

FIGURE 3. PRINCIPAL BOAT FISHING AREAS

Crab (January – December)
Salmon (August – October)
Perch (May – June)

1971

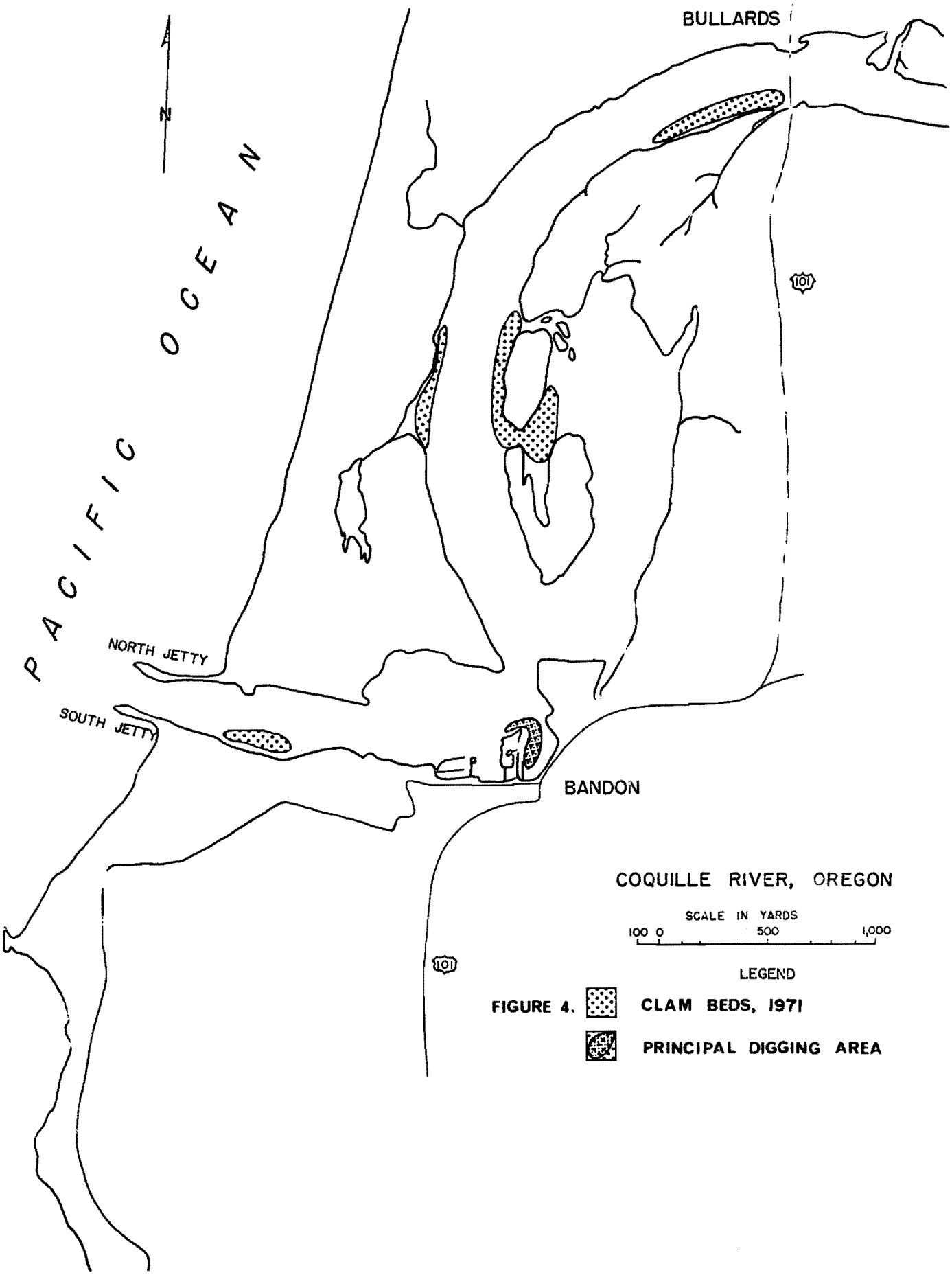
BULLARDS
N
PACIFIC OCEAN
101
NORTH JETTY
SOUTH JETTY
BANDON
101
COQUILLE RIVER, OREGON
SCALE IN YARDS
100 0 500 1,000
LEGEND
CLAM BEDS, 1971
PRINCIPAL DIGGING AREA

FIGURE 4.

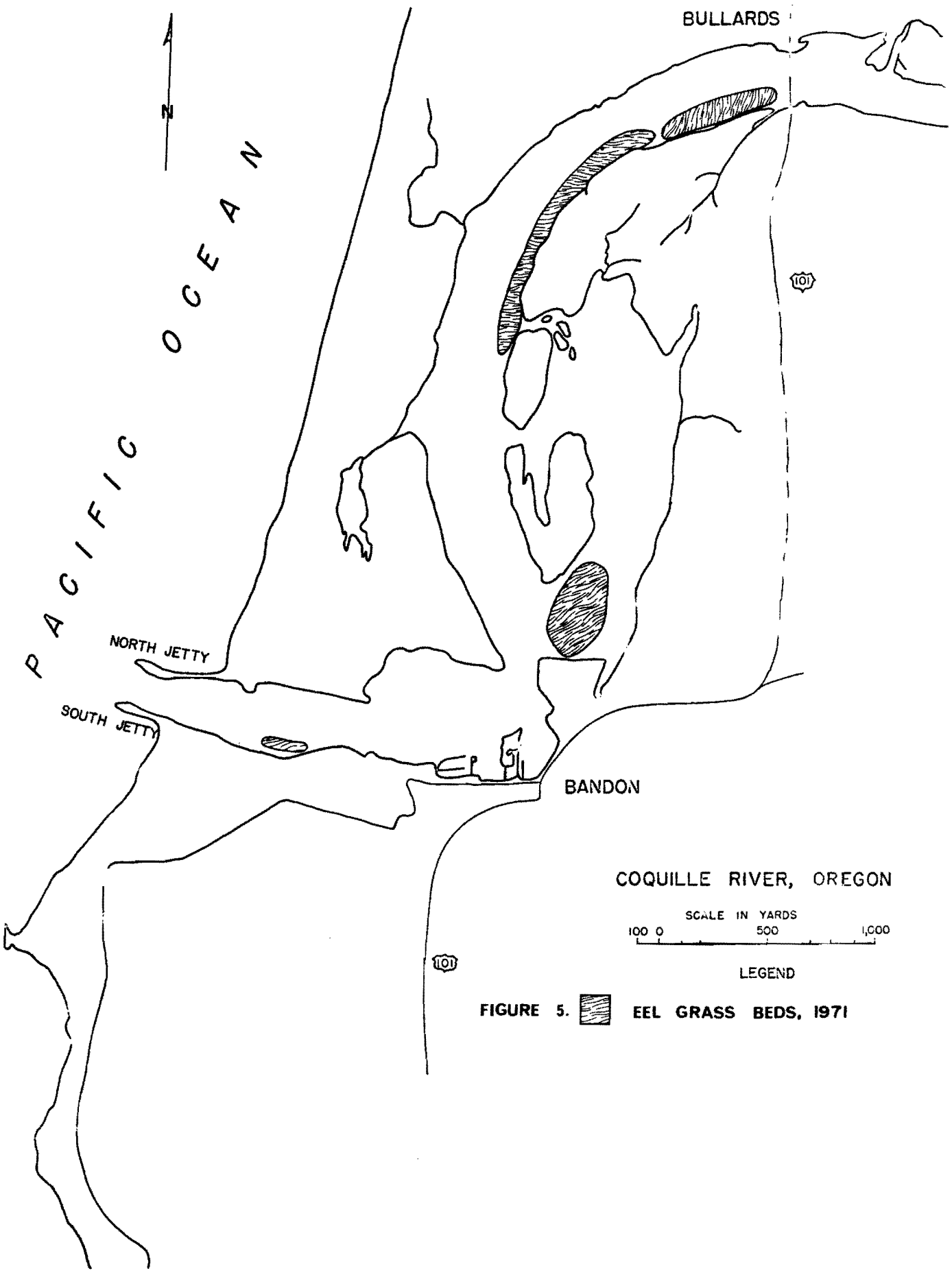

FIGURE 5. EEL GRASS BEDS, 1971

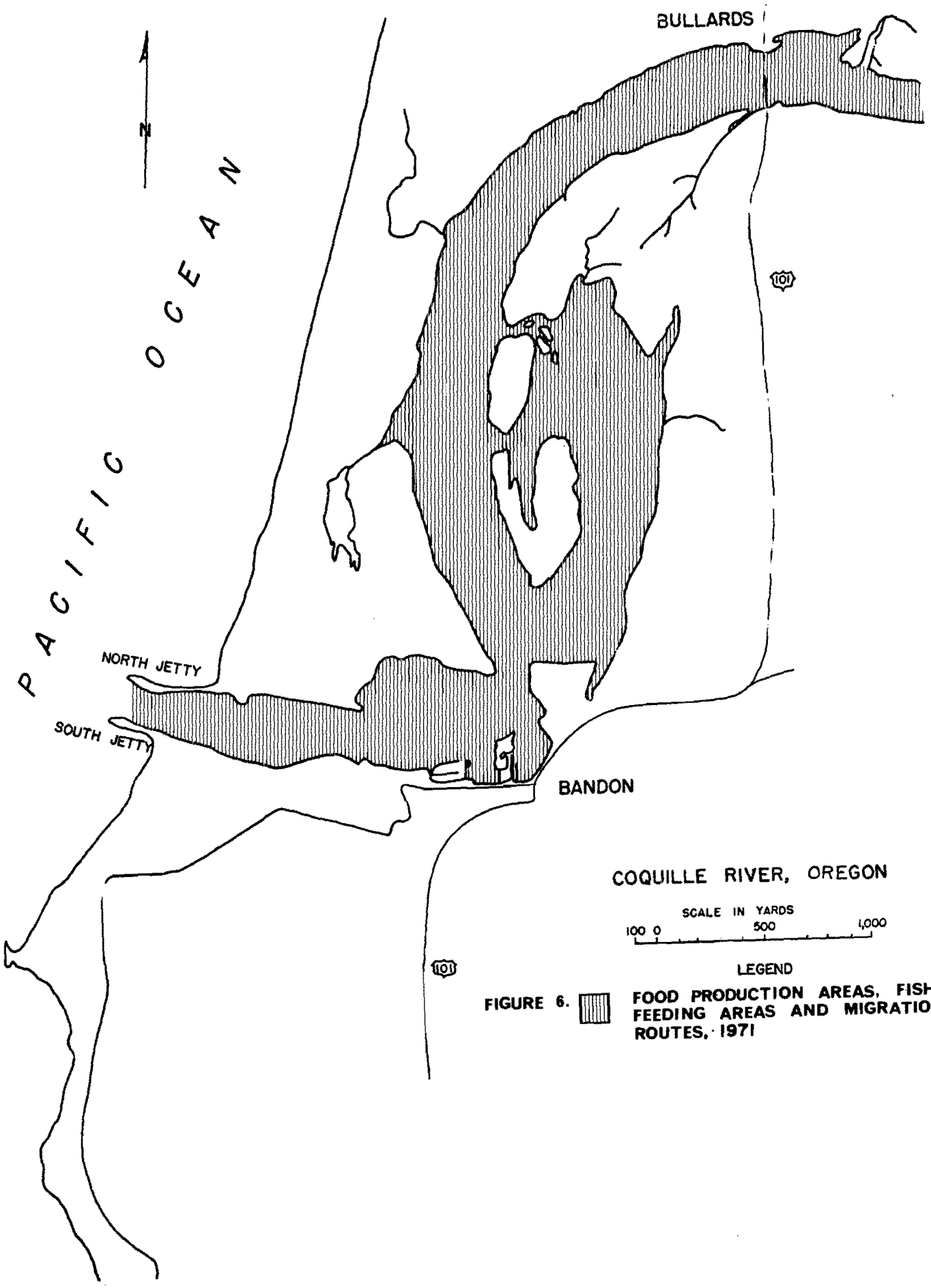

FIGURE 6. FOOD PRODUCTION AREAS, FISH FEEDING AREAS AND MIGRATION ROUTES, 1971

ACKNOWLEDGMENTS

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