

Morgan

OTTER TRAWL INVESTIGATIONS

Progress Report

May 1958-April 1959

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Introduction

During this period commercial landings of Dover sole were sampled to obtain age and size composition and sex ratios; a sampling program was continued on Dover sole to obtain age and growth data from scales and otoliths; interviews were continued with trawl fishermen to obtain areas of catch and catch per unit of effort data to be included in the IBM records; a number of meetings were attended in regard to trawl and shrimp regulations; and several trips were made at sea in order to observe shrimp fishing gear and catches.

Some money for shrimp studies was made available by the Pacific Marine Fisheries Commission for the period June 1958 through September 1958 and continued again in March 1959.

In April 1959 an English and petrale sole tagging program was conducted through the cooperation of the Exploratory Fishing and Gear Research Branch of the Fish and Wildlife Service on the vessel John N. Cobb.

Personnel

Mr. Roland Montagne worked as a Trainee on otter trawl investigations from March through September 1958.

In June 1958, Mr. Gerald Carlson and Mr. Leslie Bailey arrived to work on the shrimp studies. Their work terminated in September 1958.

In August 1958, Mr. Walter Jones terminated employment with the Fish Commission and was replaced by Mr. Stan Wilkes.

In March 1959, Mr. Dale Hagey came to work on the shrimp studies.

Regulations

Reports were submitted and meetings attended in regard to:

1. An 11-inch minimum size for trawl-caught Dover, English, and petrale sole.
2. Allowing a maximum of 3,000 pounds of petrale sole per landing with no restriction on the number of landings that could be made.

3. Elimination of the November-December season on trawl-caught black cod.
4. Personal-use bag limit for surf smelt.
5. Allowing a maximum landing of 3,000 pounds of incidental bottom fish per trap by boats fishing for shrimp. ✓

Fleet and Industry Activities

Oregon markets in 1958 were generally good for most species of bottom fish. The weather during the winter of 1958-1959 was stormy, however, and fishing was limited. Price discussions and union activities kept most boats in port at Astoria from the last week in December 1958 until February 6, 1959. Price increases of one-half a cent per pound were made by dealers for all species except mink food. The price on mink food was settled at 3 cents per pound on April 29, 1959. Since the price settlement, deliveries of mink food have been less than in past seasons, reportedly because of fear of violating the 11-inch minimum size on Dover, English, and petrale soles. Table 1 shows the published prices to the fishermen for various species of bottom fish.

In the spring of 1958 several boats left the otter trawl fleet to fish for shrimp, but most returned to bottom fish in June when shrimp landings declined. When tuna fishing picked up in August, all but 5 trawlers and one shrimp boat began fishing for tuna. After tuna became scarce the trawlers again returned to bottom fish until bad weather kept them in port through much of November and December.

Although market conditions appeared good, the New England Fish Company closed down operations at Astoria in February. Their plant at Newport was kept in operation, however. Also in February the owners of the Astoria Seafood Company in Astoria announced the opening of a new fillet plant in Coos Bay. A small fleet of 3 boats began regular deliveries at this plant. In addition, from 1 to 3 boats (Pearl Harbor, Empire II, and Amak) landed bottom fish at Coos Bay and trucked the landings to Eureka, California.

Table 1. Prices Paid per Pound for Bottom Fish at Astoria
as Published in the Astorian Budget for
February 10, 1959.

Petrale Sole	9 ¢ per pound
Sand Sole	9 ¢ per pound
English Sole over 13 inches	7 ¢ per pound
Rex Sole over 14 inches	6 ¢ per pound
Rock Fish	4½ ¢ per pound
Ocean Perch	4½ ¢ per pound
Blackcod, Dressed over 5 pounds	13 ¢ per pound
Blackcod, Dressed 3-5 pounds	7 ¢ per pound
Ling Cod, Dressed	10 ¢ per pound
Ling Cod, Round	4½ ¢ per pound
True Cod	4½ ¢ per pound
Flounder	4½ ¢ per pound

Landing Records for 1957

The landing records for 1957 catches of Dover, English, and petrale soles, and Pacific Ocean perch landed at Astoria are shown in Tables 2-5. Increases in total landings over 1956 were made for all 4 species listed. There was also an increase in the pounds per significant landing from the "local" area (Cape Falcon-Willapa Bay) for all species except petrale sole. The index of catch per unit effort, as shown by pounds per significant landing from the "local" area, for petrale sole was nearly as low as recorded in 1951. In contrast the total catch and index for catch per unit effort for English sole was the highest since 1952.

In Table 6 are shown the 1957 Oregon landings of bottom fish according to areas caught. Landings of whole fish for mink food were about 4 million pounds less than the record landings of 14 million pounds in 1956, but landings of fillet fish were up by about 5 million pounds.

Mink Food Studies in 1958

Extensive sampling of mink food landings for species composition was discontinued in 1958 to apply time to other phases of otter trawl investigations. Sampling will be resumed on a limited scale in 1959.

The mink food studies in 1958 were confined to discussions with fishermen, mink ranchers, and fish buyers in regard to the reasons for, and the effects of, a recommended 11-inch minimum size for trawl-caught Dover, English, and petrale soles.

This regulation was placed in effect by the Fish Commission in December 1958 in spite of vigorous opposition by mink ranchers and some fishermen.

Bad weather and price discussions until late April tended to obscure the effects of the regulation on mink food landings. However, at ports south of Astoria, where landings are primarily for mink food, the volume landings of small sole for mink food have disappeared.

Table 2. Total Pounds Landed, Calculated Numbers of Landings, and Pounds per Significant Landing, in Astoria for Dover Sole, 1942-1957. Allocation of Catch by Area ^{1/} for the Period 1951-1957.

Year	Total Lbs. Landed	Per Cent of Total Catch	Calculated Landings	Lbs. Per Signif. Landing
1942	2,189,287		140	15,604
1943	6,587,312		379	17,395
1944	1,318,179		103	12,759
1945	2,570,845		164	15,722
1946	2,979,687		245	12,157
1947	1,737,933		145	11,990
1948	2,943,453		247	11,913
1949	2,457,719		191	12,848
1950	4,763,173		346	13,767
1951	4,688,405		405	11,578
North	784,416		71	11,075
Local	3,804,559	81	326	11,674
South	99,430		8	12,368
1952	5,801,715		582	9,977
North	727,697		71	10,316
Local	3,204,437	55	376	8,514
South	1,869,581		137	13,647
× 1953	2,282,292		242	9,436
North	387,889		34	11,563
Local	1,254,706	55	146	8,566
South	639,697		62	10,309
1954	3,608,088		316	11,405
North	1,467,445		101	14,476
Local	1,470,777	41	164	8,953
South	669,866		59	11,439
1955	2,946,239		302	9,744
North	900,338		58	15,438
Local	1,776,741	60	217	8,179
South	269,160		33	8,128
1956	2,472,221		314	7,880
North	409,700		39	10,517
Local	1,642,557	64	224	7,339
South	419,964		52	8,055
1957	2,823,197		279	10,107
North	858,277		54	15,878
Local	1,732,147	61	210	8,242
South	232,773		11	20,486

^{1/} Area Definitions:

North — all areas north of Willapa Bay (including Willapa Deep).

Local — Cape Falcon to Willapa Bay.

South — All areas south of Cape Falcon.

Table 3. Total Pounds Landed, Calculated Numbers of Landings, and Pounds per Significant Landing, in Astoria of English Sole, 1942-1957. Allocation by Area ^{1/} for the Period 1951-1957.

Year	Total Lbs. Landed	Calculated Landings	Lbs. Per Significant Landing
1942	181,126	138	1,311
1943	665,331	126	5,280
1944	766,236	264	2,897
1945	726,314	114	6,380
1946	2,956,058	417	7,091
1947	1,338,543	166	8,071
1948	2,214,577	212	10,426
1949	765,958	72	10,602
1950	1,903,658	208	9,158
1951	2,086,088	293	7,115
North	302,053	30	10,171
Local	1,720,846	251	6,863
South	63,189	9	6,706
1952	1,736,007	334	5,201
North	396,670	39	10,090
Local	1,016,460	264	3,851
South	322,877	60	5,349
1953	937,568	220	4,252
North	171,882	18	9,359
Local	610,627	173	3,524
South	154,959	35	4,372
1954	817,882	213	3,848
North	130,166	15	8,821
Local	528,697	205	2,578
South	159,019	27	5,857
1955	882,976	251	3,517
North	94,523	12	7,680
Local	757,159	229	3,306
South	31,294	16	1,910
1956	907,999	256	3,540
North	27,051	6	4,134
Local	780,505	216	3,600
South	100,442	42	2,404
1957	1,557,590	286	5,438
North	306,610	24	12,638
Local	1,151,623	257	4,482
South	99,357	3	31,606

^{1/} Area Definitions:

North — All areas north of Willapa Bay (including Willapa Deep).
 Local — Cape Falcon to Willapa Bay.
 South — All areas south of Cape Falcon.

Table 4. Total Pounds Landed, Calculated Numbers of Landings, and Pounds per Significant Landing, in Astoria of Petrale Sole, 1942-1957. Allocation of Catch by Area ^{1/} for the Period 1951-1957.

Year	Total Lbs. Landed	Calculated Landings	Lbs. Per Significant Landing
1942	2,319,758	290	8,010
1943	1,693,983	201	8,408
1944	1,278,244	203	6,298
1945	905,428	163	5,546
1946	1,694,604	420	4,037
1947	957,082	201	4,755
1948	1,447,155	218	6,639
1949	864,113	164	5,256
1950	1,859,142	271	6,849
1951	1,054,676	232	4,539
North	240,426	61	3,963
Local	735,293	186	3,955
South	78,957	3	24,987
		22.870	
1952	1,305,997	222	5,874
North	159,772	32	4,993
Local	679,070	136	5,004
South	467,155	54	8,728
		12.270	
1953	705,608	174	4,049
North	43,435	8	5,429
Local	453,756	141	3,216
South	208,417	25	8,285
		6.270	
1954 ^{2/}	1,173,993	189	6,196
North	481,109	79	6,072
Local	501,620	81	6,223
South	191,264	29	6,497
		41.970	
1955	1,179,624	168	7,029
North	382,433	35	10,785
Local	657,828	149	4,421
South	139,363	11	13,009
1956	828,697	158	5,256
North	93,064	18	5,255
Local	500,978	107	4,667
South	234,655	33	7,026
1957	1,000,591	203	6,535
North	263,825	26	9,964
Local	517,779	160	3,236
South	218,897	17	13,007
1958	533,093	109	4,908
North	68,267	28	2,455
Local	310,488	167	1,895
South	148,340	14	9,011

^{1/} Area Definitions:

North — All areas north of Willapa Bay (including Willapa Deep).

Local — Cape Falcon to Willapa Bay.

South — All areas south of Cape Falcon.

^{2/} Correction 12-22-56.

Table 5. Total Pounds Landed, Calculated Numbers of Landings, and Pounds per Significant Landing, in Astoria of Pacific Ocean Perch, and Allocation of Catch by Area $\frac{1}{2}$ for the Period 1951-1957.

Year	Total Lbs. Landed	Calculated Landings	Lbs. per Significant Landing
1951	1,023,390	87	11,711
North	39,889	4	11,155
Local	953,232	82	11,638
South	30,269	2	14,888
1952	2,994,262	294	10,180
North	566,734	39	14,386
Local	1,737,820	190	9,123
South	689,658	66	10,500
1953	2,609,142	182	14,304
North	429,866	19	23,145
Local	1,063,590	92	11,548
South	1,115,686	72	15,601
1954	3,647,625	222	16,401
North	470,581	32	14,909
Local	1,722,464	113	15,287
South	1,454,580	79	18,512
1955	1,554,192	131	11,860
North	190,301	17	11,365
Local	820,484	80	10,242
South	543,347	35	15,514
1956	3,653,745 ✓ 2,753,745	156	17,655
North	29,450	7	4,067
Local	1,768,606	87	20,212
South	1,255,689	80	15,677
			Cor. R44
1957	3,047,100	154	19,821
North	426,209	21	20,538
Local	1,297,952	77	16,818
South	1,324,939	56	23,736

$\frac{1}{2}$ Area Definitions:

North -- All areas north of Willapa Bay (including Willapa Deep).

Local -- Cape Falcon to Willapa Bay.

South -- All areas south of Cape Falcon.

Table 6. 1957 Oregon Otter Trawl Landings
According to Area Caught.

Species	Area 3B	Area 3A	Area 2D	Area 2C	Area 2B	Total
Sablefish	Trace ^{1/}	23,500	82,500	117,000	3,500	226,500
Gray Cod	25,500	147,500	337,500	3,000	2,000	515,500
Ling Cod						
Round	Trace	36,500	215,000	58,000	190,500	500,000
Dressed	6,000	4,500	29,500	4,500	500	45,000
Ocean Perch	1,000	230,000	1,544,500	1,060,500	158,500	2,994,500
Other Rock Fish	1,500	279,500	2,291,000	447,500	352,500	3,312,000
Petrale Sole	27,500	221,500	547,000	636,500	664,000	2,096,500
English Sole	100,500	165,500	1,117,000	196,000	75,000	1,654,000
Dover Sole	30,000	658,000	1,938,000	451,500	483,000	3,560,500
Rex Sole	14,000	59,000	473,000	11,500	7,500	565,000
Rock Sole	--	--	--	--	--	--
Starry Flounder	3,500	81,500	229,500	Trace	5,500	320,000
Other Flatfish	--	--	--	500	3,500	4,000
Dog Fish	--	--	--	--	--	--
Misc. Species	3,500	--	--	--	--	3,500
Sub-Total	213,000	1,907,000	8,744,500	2,986,500	1,946,000	15,797,000
Animal Food ^{2/}	140,000	295,000	2,998,000	3,793,000	2,787,000	10,055,000
Industrial	--	--	132,000	1,000	--	133,000
Shrimp	--	23,000	93,500	--	--	116,500

^{1/} Less than 250 pounds.

^{2/} Breakdown estimated from samples:

	<u>Pounds</u>	<u>Per Cent</u>
Ocean Perch	703,850	7
Other Rockfish	2,312,650	23
Petrale Sole	201,100	2
English Sole	402,200	4
Dover Sole	1,206,600	12
Rex Sole	1,407,700	14
Turbot	3,016,500	30
Bellingham Sole	100,550	1
Misc. Fish	703,850	7

Surf Smelt

Interviews were made with interested individuals in regard to complaints of wastage of smelt caught in the ocean surf at Cape Arago, south of Coos Bay.

In order to reduce the possibility of waste and to make the regulations similar for fishing all species of smelt, it was recommended that personal-use bag limits of 25 pounds per person be established. This recommendation was made a regulation by the Fish Commission in February 1959.

English and Petrale Sole Tagging

Through the cooperation of the U. S. Fish and Wildlife Service, a tagging program was conducted on Cruise 42 of the John N. Cobb. English and petrale soles were tagged during the period April 16-25, 1959. Bad weather after this date eliminated several more days of the cruise. However, from the standpoint of tagged fish released, the cruise was very successful. During the period, 4,599 English sole and 542 petrale sole were tagged.

Tagged Fish Recoveries

Extremely bad weather in the winters of 1957-1958 and 1958-1959 limited trawling in the deep-water areas where tagged spawning Dover sole from the April 1955 tagging might have been concentrated. Regulations restricting petrale sole landings in the winter also discouraged some deep-water fishing. As a result, most of the recoveries of tagged Dover sole from the deep-water areas were made in the spring. Fishing effort has declined for Dover sole from the Columbia River north to areas off Grays Harbor, and few recoveries have been made from in-shore grounds in recent seasons. Recoveries of tagged Dover sole by month and depth are shown in Table 7. Approximately 10 per cent of the total Dover sole tagged have been recovered and verified. Other tagged fish have been reported but were lost at the dock or on the fillet lines. Other tagged Dover sole have been reported as discarded at sea.

An interesting recovery was made of a tagged starry flounder by a Washington trawler fishing near Destruction Island on January 29, 1959. This flounder had

Table 7. Recoveries of Tagged Dover Sole Released During Deep-Water Tagging, April 1955.

Recovery Time	Recovery Areas			Total
	Inshore ^{1/}	Off Shore ^{2/}	Unknown	
<u>1958</u>				
January-February	0	3	0	3
March-April	0	23	0	23
May-June	3	0	0	3
July-August	1	0	0	1
September-October	0	1	1	2
November-December	<u>0</u>	<u>9</u>	<u>0</u>	<u>9</u>
Total	4	36	1	41
<u>1959</u>				
January-February	0	1	0	1
March-April	<u>0</u>	<u>7</u>	<u>0</u>	<u>7</u>
Total	0	8	0	8
Grand Total Including Previous Years	45	185	8	238
Per Cent of Total Tagged (2,415 fish)	1.9	7.7	.3	9.9

^{1/} Less than 150 fathoms.

^{2/} Greater than 150 fathoms.

been tagged from the McGowan salmon trap in the Lower Columbia River on March 30, 1953. The discs were very thin, cracked, and fragile. Unfortunately, the size of the tagged fish at recovery was not reported.

A number of tagged English sole released by the Washington Department of Fisheries in July 1956 off Destruction Island have been recovered off Oregon primarily from the winter and spring landings at Astoria.

Dover Sole Sampling

The sampling of market landings of Dover sole to determine the size, sex, and age composition were continued in 1958. During the June-September period, 8 samples containing a total of 3,172 Dover sole were taken. The mean length of 429 mm. for females was the smallest observed since 1955. There are probably 2 reasons for the greater number of small fish in the landings. One reason is the possibility of one or more strong year classes entering the fishery. The other reason is the acceptance by the fillet lines of more Dover sole less than the standard 14-inch market minimum.

Approximately 35 per cent of the fish sampled from the fillet lines were males. This is the lowest percentage males noted in the samples since 1954.

The scale and otolith sampling for age and growth data were continued into the winter period of 1958. However, a sampling schedule was difficult to maintain because of the few Dover sole landed and the intermittent landings. This sampling program has been discontinued, and an analysis of the data will be completed as soon as possible.

Samples to determine the age composition of the commercial catch were combined at times with the age and growth samples. As a result, the age composition of the catch for 1957 and 1958 has not yet been determined, although most of the samples have been processed.

The 1958 Shrimp Fishery

Due to inclement weather during the winter months, Oregon's shrimp fleet was inactive until the latter part of February. After a few small deliveries, the

catches grew steadily larger until by May several boats were bringing in loads of 30,000 pounds or more. The largest single landing in Oregon for 1958 was 43,000 pounds. Over 1 million pounds of shrimp were landed in Warrenton during the peak period, May 1 through June 20. At that time, all of the Oregon boats, as well as most of Washington's, were concentrated in the Tillamook Rock and Cape Lookout areas. Approximately 2 million pounds of shrimp caught in the above areas were landed at Washington ports. As shrimping began to taper off after June 20, most of the boats turned to other types of fishing. Many put on trolling gear and went in search of albacore while others resumed dragging for bottom fish. By the middle of July only 1 Oregon boat was fishing regularly for shrimp. This boat had good, but not exceptional, success during both July and August, averaging about 10,000 pounds per trip for 9 trips. Toward the end of September and in the early part of October, a few more boats came back into the fishery, but the paucity of fishable concentrations of shrimp coupled with the usual bad weather conditions resulted in poor catches for the period September through December. In 1958, 18 boats made 138 deliveries at Warrenton totalling 1,522,755 pounds for an average of about 11,000 pounds per landing. Of these 18 boats, 13 made 3 or more deliveries. Between 7 and 10 per cent of the poundage landed in Oregon was taken from areas north of the Columbia River. Little fishing was done in 1958 in the Coos Bay-Umpqua River area where 3 California beam trawlers caught in excess of 200,000 pounds of pink shrimp during the summer of 1957.

The 1959 Fishery -- January through April

In contrast to 1958, Oregon's shrimp fishery got off to an early start in 1959. Although fishing was good from a catch per hour standpoint, the total landings through March were not very high due to the weather which is quite a limiting factor during this time. As the weather improved, fishing effort increased and production for April soared over the 1/2-million pound mark, more than quadruple the amount delivered during the same month in 1958. During the period January through April, 11 boats made 94 deliveries for a total of 856,996

pounds and a per trip average of slightly over 9,000 pounds. The highest single landing to date in 1959 was a little over 26,000 pounds. As in 1958, most of the poundage was taken from the Tillamook Rock and Cape Lookout areas. However, this year a small amount came from the Coos Bay and Newport areas. So far this year Oregon landings have included only about 17,000 pounds of shrimp caught in Washington waters. Likewise, Washington's fleet has been less active along the Oregon coast this year.

Catch Statistics

A considerable amount of time is being devoted to the collection of catch data. This includes such information as the number of tows, depths, areas, and hours fished. This information is obtained either through personal interviews with the fishermen or from log books which they keep. The material is then converted to a coded form and punched on IBM cards along with the landing records for the respective trip to which that information applies. Table 8 contains catch per hour data for 1958 and 1959 (January through April) as well as the number of landings and the total pounds landed.

Shrimp Studies

These studies have included sampling the commercial landings of shrimp, observations at sea on commercial boats, and trips on two research vessels: the N. B. Scofield operated by the California Department of Fish and Game and John N. Cobb operated by the U. S. Fish and Wildlife Service.

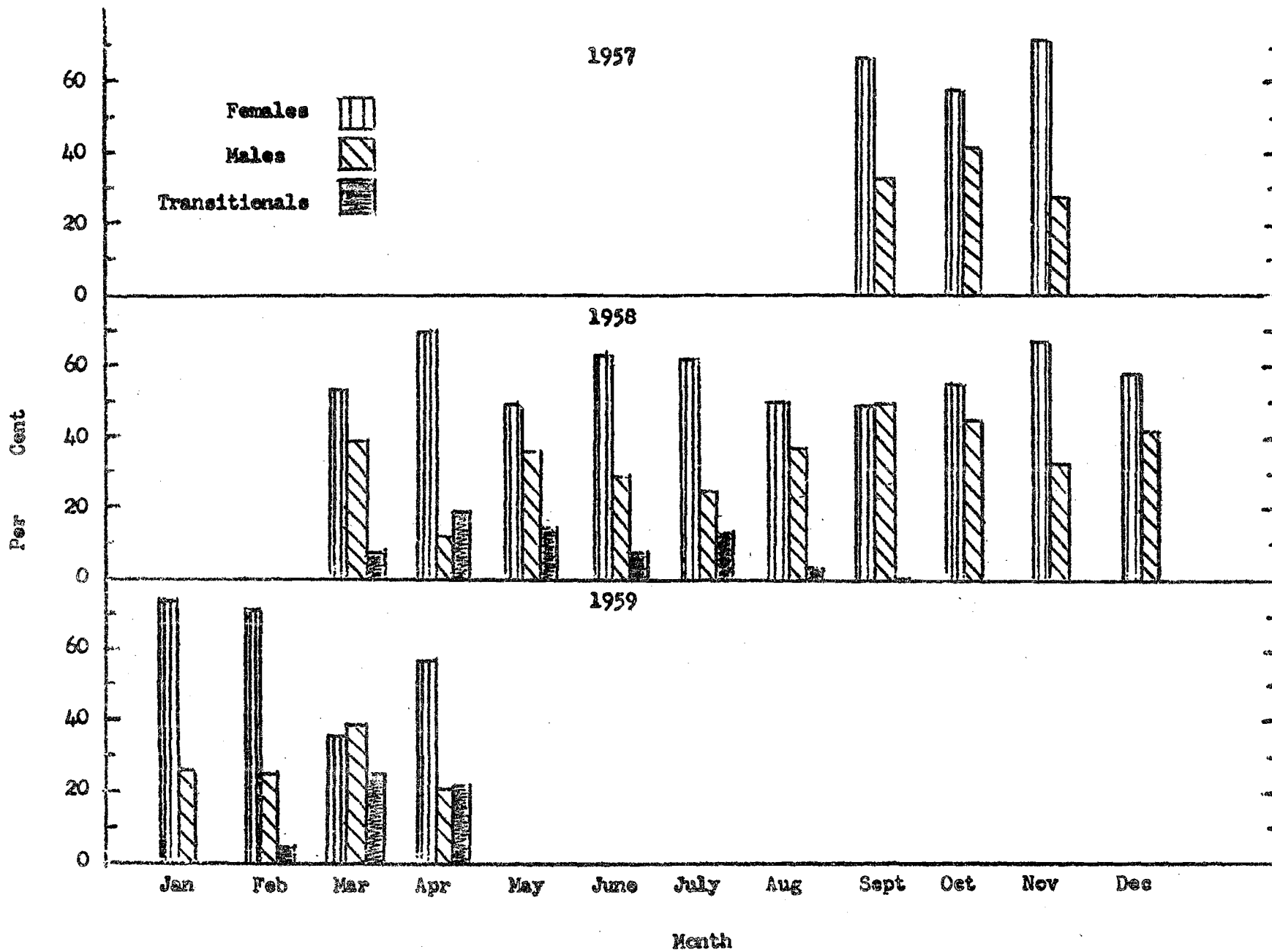
Samples of the commercial landings of shrimp have been examined for sex ratios, size composition, and percentage of gravid females. An analysis of the samples indicated that females made up between 50 and 70 per cent of the shrimp landed. The percentage of males ranged from 15 to 45, and the remainder were transitionals. The larger males appear to be changing into females. In late July the numbers of shrimp in the transitional phase decreased and by the end of August very few were observed. In July and August a corresponding increase in the numbers of small female shrimp were observed. Monthly sex ratios are shown in Figure 1.

Table 8, Catch per Hour, Total Pounds Landed, and Number of Landings of Pink Shrimp in Oregon by P.M.F.C. Area, 1958-1959.

Year	Area	Catch per Hour in Pounds	Total Pounds Landed	Number of Landings
1958 (Jan-Dec)	Cape Elizabeth to Willapa Bay	386	81,121	8
	Willapa Bay to Cape Falcon	499	1,018,345	99
	Cape Falcon to Cape Perpetua	592	423,289	31
	Cape Perpetua to Cape Blanco	None	None	None
	Total	492	1,522,755	138

1959 (Jan-April)	Cape Elizabeth to Willapa Bay	288	16,398	4
	Willapa Bay to Cape Falcon	490	243,182	38
	Cape Falcon to Cape Perpetua	624	584,866	51
	Cape Perpetua to Cape Blanco	1,569	12,550	1
	Total	573	856,996	94

Figure 1. Monthly Sex Ratios of Pink Shrimp Taken from Commercial Samples, August 1957-April 1959.



Beginning in mid-October, the percentage of gravid females increases rapidly from about 5 per cent to nearly 70 per cent in mid-November. The fishery did not operate during most of the winter of 1957-58, but when samples were available in late February it appeared that the number of gravid females underwent a rapid decrease about that time and that by the end of March there were practically none. Data collected during the fall and winter of 1958-59 compares quite closely with the available information from the season before. Figure 2 shows the per cent gravid females throughout the egg bearing season for 1958 and 1959.

The cruises of the Cobb and the Scotfield took place during the spring and summer of 1958. The purposes of these cruises were two-fold: (1) to explore for new shrimp fishing areas; and (2) to compare the efficiency of various types of shrimp nets. Unfortunately, all of the data obtained on the Cobb and Scotfield cruises are not yet available. As soon as it is available, a comprehensive report on each of the cruises will be forthcoming.

Incidental Fish

Since the trawls used for pink shrimp are of a rather small mesh, they are capable of catching a wide size range of marine organisms. Because of this, we are concerned with the composition and magnitude of the incidental fish catch of these nets. It has been our observation that under normal fishing conditions the incidental catches of fish are not excessive nor do they usually contain large numbers of small, immature foodfish, with the exception of rex sole. As shown in Table 9, rockfish comprise the largest portion of the incidental foodfish landing. The rockfish, which tend to have a fairly wide vertical distribution, seem to be more vulnerable to the shrimp trawl than are the flatfishes. This is because the shrimp net is normally fished slightly off the bottom and occasionally large concentrations of rockfish are found in this zone over the shrimp beds. Dover sole is by far the most important flatfish species in the incidental fish catch in terms of volume landed.

Figure 2. Percentage of Gravid Female Pink Shrimp Throughout the Egg-Bearing Season.

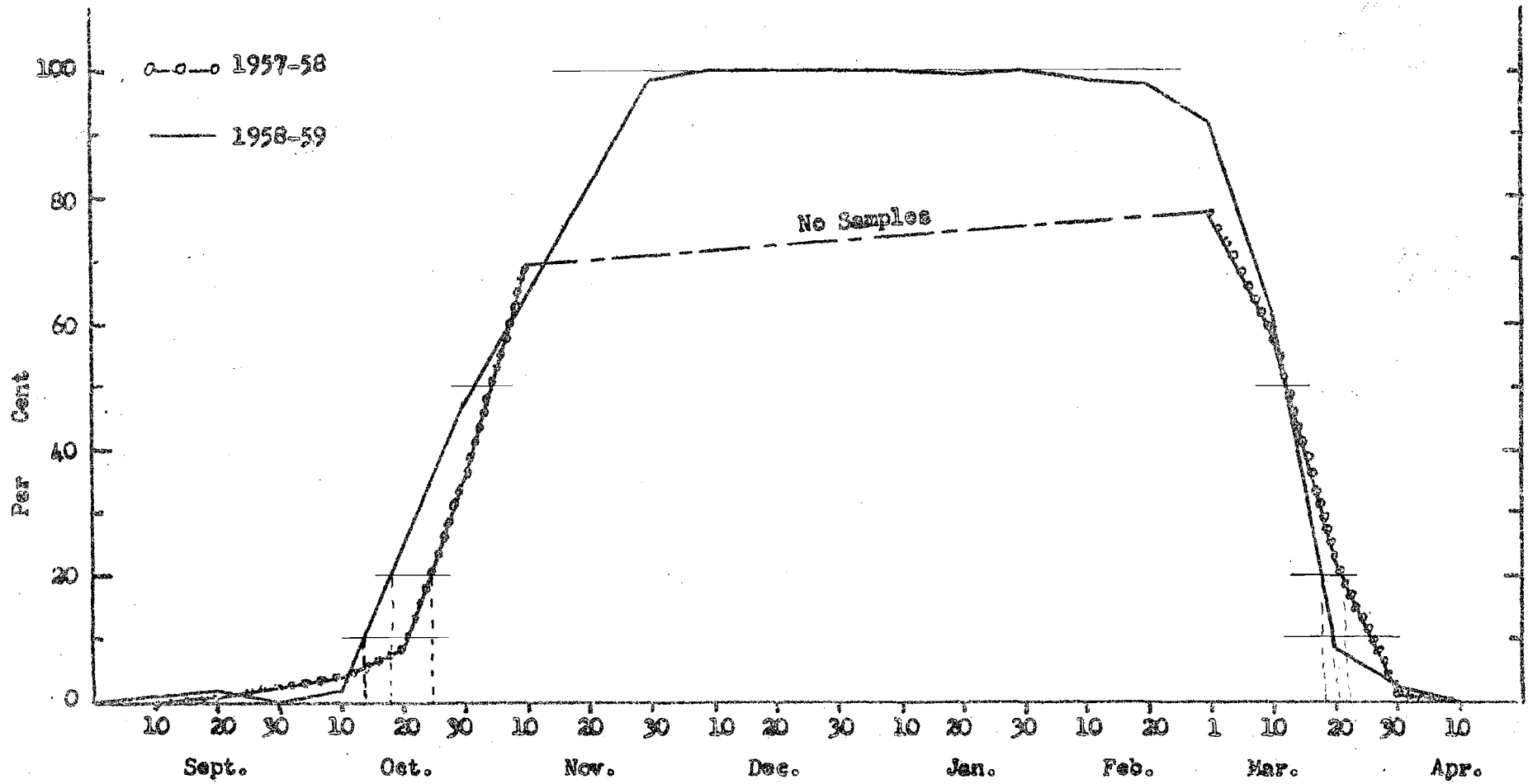


Table 9. Species Composition in Per Cent by Weight of Incidental Fish Landed by Oregon Shrimp Trawlers in 1958.

Species	Weight in Pounds	Per Cent
Rockfish ^{1/}	108,834 <i>Rock-mud</i>	50.7
Dover Sole	40,123 <i>mud</i>	18.7
Pacific Ocean Perch	32,354	15.1
Ling Cod	12,064 <i>Rock</i>	5.6
True Cod	7,523	3.5
Rex Sole	5,050 <i>mud</i>	2.4
Sablefish	4,383	2.0
Petrale Sole	3,781 <i>sand</i>	1.8
English Sole	<u>531</u> <i>sand</i>	<u>0.2</u>
Total	214,643	100.0

^{1/} This category includes all rockfish with the exception of Pacific Ocean perch.

As an outgrowth of a P.M.F.C. recommendation, a limit of 3,000 pounds was set on the amount of incidental fish which could be brought in for any one trip. This limit, which went into effect early in 1959, is large enough to cover the average landing by does not allow for those instances where the incidental catch of rockfish is large. Approximately one-third of the incidental fish landings in 1958 were in excess of 3,000 pounds. This is shown in Table 10 along with the total and average incidental fish landings.

Table 10. Oregon Landings of Fish Caught Incidentally
in the Shrimp Fishery in 1958.

Total Pounds Landed	Average Landing in Pounds	Number of Deliveries	
		Under 3,000 Lbs.	Over 3,000 Lbs.
214,643	2,385	62	28

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