

W. Jones

OTTER-TRAWL INVESTIGATIONS
PROGRESS REPORT

November 1955 - April 1956

INTRODUCTION

The winter period, November-April, for the otter-trawl staff was largely filled up with preparation for, and attendance at, various public and private meetings. The following list includes most of the meetings attended during this period.

<u>MONTH</u>	<u>MEETING</u>	<u>LOCATION</u>	<u>PERSONNEL</u>
December	Project Leaders	Clackamas	Westrheim
	P. M. F. C.	Seattle	Westrheim
January	Industry 1/	Astoria	Westrheim Jones
	Industry 1/	Newport	Westrheim
	Industry 1/	Coos Bay	Westrheim
	Experimental Fur Farm	Corvallis	Westrheim Jones
	O. F. C.--Public Hearing	Portland	Westrheim Jones
February	Staff Meeting	Corvallis	Westrheim Jones
	Industry 2/	Astoria	Westrheim Jones
March	P. M. F. C.--Biologists	Seattle	Westrheim
	P. F. B.	Lake Wilderness	Westrheim
	Industry 2/	Newport	Westrheim Jones

1/ Meetings to acquaint the industry with the P. M. F. C.-sponsored trawl regulations which were to be considered at the January O. F. C. public hearing. These recommendations are: (1) closed season on petrale sole; (2) closed season on sable fish; and (3) minimum size on sablefish.

2/ Meetings to acquaint industry with the progress of the otter-trawl research program.



The remainder of the winter period was taken up with a variety of projects. The 1955 mink food sampling data were analyzed during November and December, and a preliminary report written. Work also continued on a report entitled, "The Oregon Mink Food Fishery, 1953-54". Two progress reports (November 1954-55; and May-October 1955) were also completed during this period.

During March and April work was resumed on a report entitled, "On the Biology of the Pacific Ocean Perch (Sebastes alutus)". Reports on the 1951-53 flounder tagging experiment, and the 1951-53 juvenile English sole studies were published in the Research Briefs.

The 1953 Dover sole otoliths (1,100) were read during the month of April.

Routine maintenance of our statistical system and editing filled out the remainder of the time.

Three new regulations affecting the otter-trawl fishery were promulgated by the Fish Commission in January. Briefly, the regulations are as follows:

1. Closed season for petrale sole, February 1-April 15, with a tolerance of 5,000 pounds per landing.
2. Closed season for sablefish, November 1-December 31.
3. Minimum size for sablefish of 25 inches, total length, or 3 pounds, dressed, heads off.

All of these regulations are included in General Order XXVIII.

FLEET ACTIVITIES

Trawl fishing operations at all Oregon ports were extremely limited from November 1955 through March 1956. Winter storms which followed closely upon one another kept the trawl vessels tied up except for a few short trips between storms. Fair weather throughout April allowed normal fishing operations to be resumed.

Twenty-three trawl vessels operated out of the Astoria area as of April 30 (Table 1). Three of these vessels, "Marie H", "Mary R", and "Washington (L)", are owned by mink ranchers and are fished primarily for mink food.

Five fillet plants and one mink food plant were in operation in the Astoria area during this period.

The mink food fishery has become a major operation at Astoria with all of the trawlers participating, some to a greater extent than others. In addition to the Oregon Fur Producers Association plant which regularly received whole bottomfish for mink food, two fillet plants regularly received major landings of bottomfish for mink food. All other fillet plants in the Astoria area also received some landings of fish for mink food.

Five trawl vessels, the "Galaxy", "New Mexico", "Betty", "Kiska", and the "Shirley Lee", are now equipped with electronic fish-finding devices for more efficient trawl operations. Skippers of these boats report spotty success with the fish-finders. It appears to be a matter of learning to distinguish between species of fish and other phenomena by the operator for more efficient use of the instruments.

The "Marie H", owned by Paul Autio, ^(Astoria) a progressive mink rancher, has been equipped with a brine tank and refrigeration machinery to permit chilling and storage of fish in the hold of the boat. This system replaces the use of ice and appears to keep the fish in better condition over longer periods of time than ice. Some bugs in the operation have yet to be ironed out, but the operation looks promising. Mr. Autio purchased the ex-New England Fish Company dock at the foot of 16th Street in Astoria for landing the fish.

Trawl fish landed at Newport, Winchester Bay, and Coos Bay, continued to consist mainly of mink food. Four trawlers fished regularly out of Newport during this period. Three trawlers fished out of Winchester Bay, and three out of the Coos Bay area.

FIELD WORK

No field work took place during this period.

Table 1. List of Oregon Trawl Vessels, by Home Port,
April 30, 1956

ASTORIA	NEWPORT	WINCHESTER BAY	COOS BAY
Betty	4 Alten	3 Alta	3 Geneva
Daphne	Dare II	C.T. Holland	Nel-Ron-Dic
Galaxy	Destiny	Hero	Pearl Harbor 1/
Georgene	Margaret E		Amak
Jennie F. Decker	Pacific Queen } May 1956		
Jimmy Boy	Ruth Ellen } October		
Kinchel'oe	Harold J.		
Kiska			
Marian F			
Marie H.			
Mary R			
Nestucca			
New Mexico			
Rose Ann Hess			
San Antonio			
Shirley Lee			
Silver Queen			
Tralee			
Trask			
Trego			
Valhalla II			
Washington			
Washington (L)			

1/ Home port is Eureka, California, but landings are made in Coos Bay and trucked to Eureka.

New Hope
Madeline J.
Eagle

25

7

3

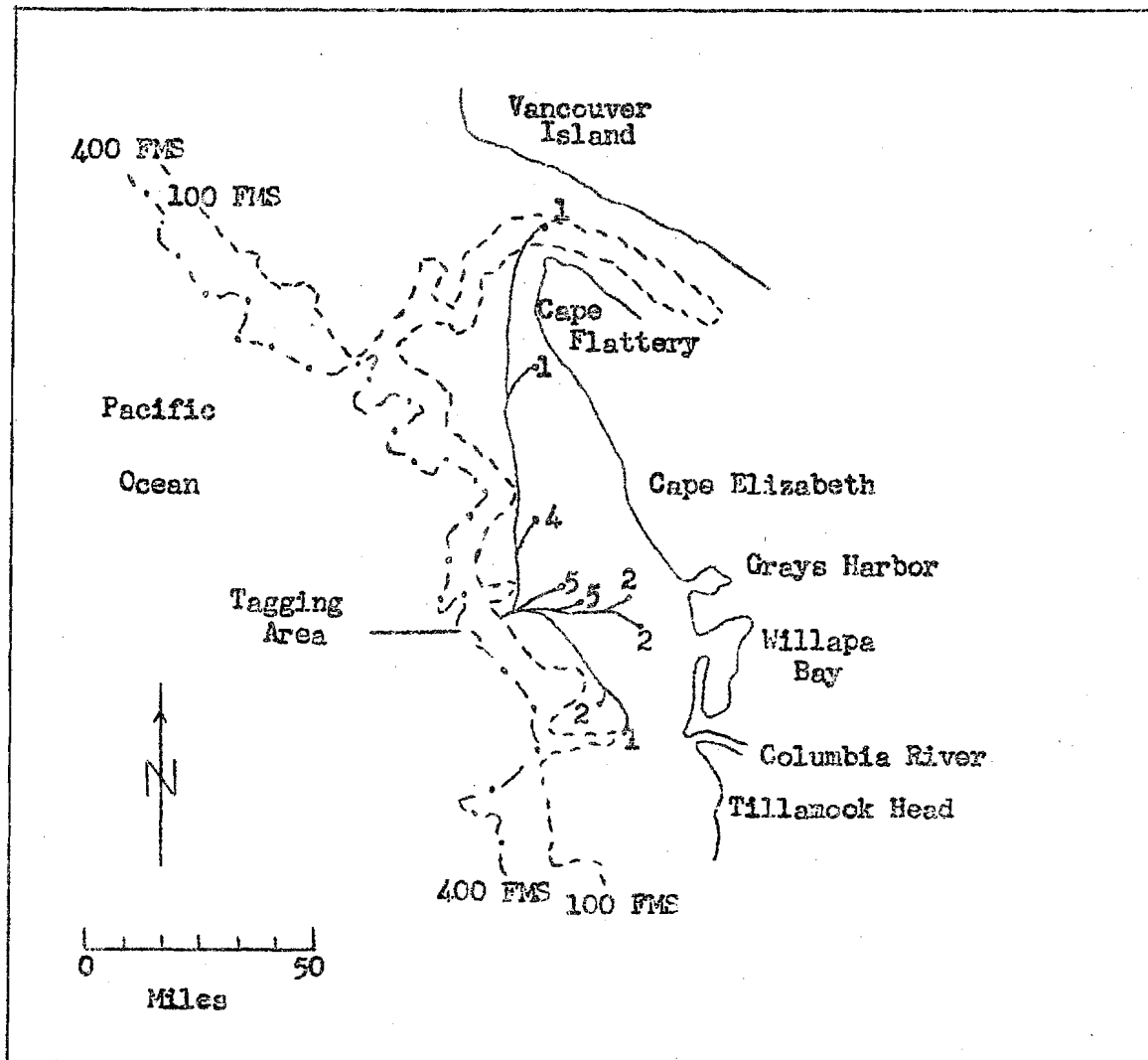
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Sambaldi
WCF #1

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Figure 1. Chart of the Oregon and Washington Coastlines, Showing Location of Tagging Area (Willapa Deep) and Location of Tag Recoveries



LABORATORY WORK

The laboratory work consisted of the aforementioned projects. For this report only the results from two tagging experiments, and a brief summary of the mink food studies will be discussed.

Tagging Experiments: Dover, 1955

The most recent tagging experiment took place in April 1955 when 2,406 Dover sole were tagged in the Willapa Deep in order to determine, if possible, whether the winter stocks in deep water do contribute to the summer inshore fishery (see OTTER TRAWL PROGRESS REPORT, November 1953 - April 1955). We have recovered 56 tags (2.3 per cent) through April 30, 1956. Table 2 and Figure 1 present the preliminary results.

During the 13-month period (April-April) 26 tagged Dover sole were recovered in the Willapa Deep and 23 from inshore areas. Seven tags were recovered for which no location of recovery was known. Virtually all the inshore recoveries were taken northward from the tagging area--one as far as the Straits of Juan de Fuca.

During April and May 1955, 9 tagged Dover sole were recovered in the Willapa Deep, and 1 inshore. During June, July, and August of 1955, no tags were recovered in the Deep, and 18 inshore. During September, October, and November of 1955, 4 tags were recovered in the Deep, and 4 inshore. There were no recoveries during December.

During January, February, and March 1956, 13 tags were recovered from Willapa Deep and none from inshore areas. No tag recoveries were made in April.

From these sparse data it is apparent that the Dover sole which are found in the Willapa Deep during the fall and winter months do contribute to the inshore summer fishery. However, this experiment was not designed to determine the proportion of the deep water stock which moves inshore during the summer months. We have no way to determine, at the present time, whether any of these fish remain in the deeper waters during the summer months. Apparently they

Table 2. Tagged Dover Sole Recoveries
 April 1955 - April 1956, by Area

TIME OF RECOVERY	RECOVERY AREA		
	Willapa Deep	Inshore	Unknown
1955			
April-May	9	1	0
June-August	0	18	0
September-November	4	4	2
December	0	0	0
1956			
January-March	13	0	5 ¹ / ₁
April	0	0	0
TOTAL	26	23	7

¹/₁ Received March 19 from Washington State Department of Fisheries. Date of landing and/or recapture unknown.

are not present in the Willapa Deep in any quantity since the Astoria trawlers periodically fished the area during the summer months with little success.

Tagging Experiments: Flounder, 1951-53

A report covering the 1951-53 flounder tagging experiment on the lower Columbia River has been published in the Research Briefs (Vol. 6, No. 1). However, that report dealt only with recoveries through December 1954. During the period January 1955 through April 1956, we have received 21 additional tag recoveries--17 in 1955, and 4 during the first 4 months of 1956.

In Table 3 are listed the numbers of recoveries, 1951-56, by general area, i.e., inside and outside the Columbia River. During 1955, 11 tagged flounder were recaptured by gill-nets in the lower Columbia River. Otter trawls recaptured 4 of the 6 outside recoveries--1 off the Columbia River, and 3 in the Umatilla Lightship-Cape Flattery area. Two tagged flounder were recaptured by sport fishermen off Grays Harbor.

During 1956 (January-April), there were no tag recoveries inside the Columbia River, and 4 recoveries of tagged flounder outside the Columbia River. The trawl fishery accounted for all 4 outside recoveries--1 off the Columbia River; 2 in the Quillayute-Cape Flattery area; and 1 off Rose Spit, off the northeastern tip of Graham Island (Queen Charlotte Islands), 470 miles north of the tagging site.

1955 MINK FOOD SUMMARY

Lardings of trawl fish for mink food in 1955 exceeded landings of trawl fish for the fillet market for the first time in Oregon. A total of 11.0 million pounds of fish were landed for the mink food market last year, as opposed to 10.5 million pounds of fish for the fillet market. Approximately 6.3 million pounds of the fillet market fish were also sold for mink food as fillet scrap, the fish carcass remaining after removal of the fillets. Thus a grand total of 17.3 million pounds of trawl-caught fish (whole fish + fillet scrap) delivered to Oregon ports was sold for mink food in 1955.

Table 3. Tagged Flounder Recoveries from the 1951-1953 experiment
by Recovery Area

YEAR	INSIDE COLUMBIA RIVER	OUTSIDE COLUMBIA RIVER
1951	4	4
1952	12	2
1953	56	15
1954	13	5
1955	11	6
1956 <u>1/</u>	0	4
TOTAL	96	36

1/ January-April

Table 4. Pounds of Whole Bottomfish Landed for Mink Food
in Oregon During 1955, by Port, by Month

MONTH	ASTORIA	NEWPORT	OTHER ^{1/}	TOTAL
January	75,197	10,085	7,840	93,122
February	123,335	72,305	2,885	198,525
March	253,375	192,020	3,321	448,716
April	86,420	160,160	7,210	253,790
May	723,044	524,970	14,600	1,262,614
June	845,120	730,185	272,468	1,847,773
July	725,220	486,505	302,985	1,514,710
August	1,422,796	518,575	217,462	2,158,833
September	1,045,791	568,080	335,233	1,949,104
October	353,960	190,513	146,646	691,121
November	161,970	104,960	65,194	332,124
December	123,650	---	81,450	205,100
Total	5,939,878	3,558,358	1,457,296	10,955,532

^{1/} Winchester Bay and Coos Bay landings

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All of the trawl fish landed in Oregon for mink food were not utilized by Oregon mink ranchers, however. Some fish (the amount unknown), principally fillet scrap, were shipped to ranchers in other states, i.e., Idaho, Utah, Colorado, and some of the Great Lakes states. The poor fishing weather during the last third of 1955 created a shortage of fish for mink food in Oregon, and some fish were shipped into Oregon from the Great Lakes states and Washington to fill the need.

Astoria ports received 5.9 million pounds of whole fish for mink food as compared to 3.6 million pounds received at Newport in 1955 (Table 4). This reversed the trend of the previous two years in which the Newport landings were larger. Landings in ports south of Newport amounted to 1.5 million pounds.

The great majority, 3.7 million pounds, of the Oregon trawl landings of mink food occurred during the months of May through September 1955. This has generally been the pattern of the past three years.

Twenty-seven vessels landed mink food at Astoria last year. The size of the landings ranged from 50 pounds to 101,000 pounds with an average landing of 10,000 pounds per trip.

More Astoria boats were actively fishing for mink food in 1955 than in 1954. Eight of the Astoria vessels landed over 400,000 pounds of mink food apiece in 1955, accounting for 64 per cent of the fish landed for mink food at Astoria. In 1954 only two vessels landed over 400,000 pounds of mink food. These two boats accounted for 70 per cent of the mink food landed at Astoria that year.

The species composition, by weight and per cent, of the trawl fish landed for mink food in Oregon, by port, during 1955 is shown in Table 5. The weight of each species was computed from samples taken of mink food landings throughout the summer as explained in a previous report. As in 1953 and 1954, turbot, rex sole, and rockfishes were the major species of fish (72 per cent in 1955) landed for mink food.

Landings of rockfishes at Astoria were comparatively small (154,000 pounds at Astoria compared to 1,210,000 pounds at Newport). This is due in part to the

Table 5. Species Composition by Weight of Landings of Whole Bottomfish Landed in Oregon for Mink Food During 1955, by Port

SPECIES	ASTORIA		NEWPORT		OTHER ^{1/}		TOTAL	
	Pounds	Per Cent	Pounds	Per Cent	Pounds	Per Cent	Pounds	Per Cent
Dover Sole	416,000	7	242,000	7	140,000	10	798,000	7
English Sole	718,000	12	4,000	Tr	56,000	4	778,000	7
Petrale Sole	63,000	1	14,000	Tr	30,000	2	127,000	1
Bellingham Sole	202,000	3	---	--	4,000	Tr	206,000	2
Flounder	398,000	7	---	--	94,000	7	492,000	5
Rex Sole	1,705,000	29	39,000	1	117,000	8	1,861,000	17
Turbot	1,925,000	32	1,850,000	52	685,000	47	4,460,000	41
Misc. Sole ^{2/}	131,000	2	4,000	Tr	35,000	2	170,000	2
Rockfish ^{3/}	154,000	3	1,210,000	34	198,000	14	1,562,000	14
Misc. ^{4/}	208,000	4	195,000	6	98,000	7	501,000	5
TOTAL	5,940,000	100	3,552,000	100	1,457,000	101	10,955,000	99

^{1/} Winchester Bay and Coos Bay landings

^{2/} Misc. Sole: Flathead Sole, Rock Sole, Sand Dab, Sand Sole, Slender Sole.

^{3/} Rockfish: Sebastes albus, S. brevispinis, S. crameri, S. diplocheilus, S. elongatus, S. flaviventris, S. inornatus, S. jordani, S. melanops, S. mystinus, S. paucispinis, S. pinniger, S. ruberrimus, S. rubrivinctus, S. saxicola, S. sp., and Sebastolobus alascanus

^{4/} Misc. Fish: Black Cod, Dogfish Shark, Grenadier, Hake, Jack Mackerel, Lingcod, Pilchard, Ratfish, Scalpin, Sea Peacher, Shad, Skate Tom Cod, True Cod

Figure 2. Weighted Length-Frequencies of Dover Sole Landed in Oregon, 1953-55

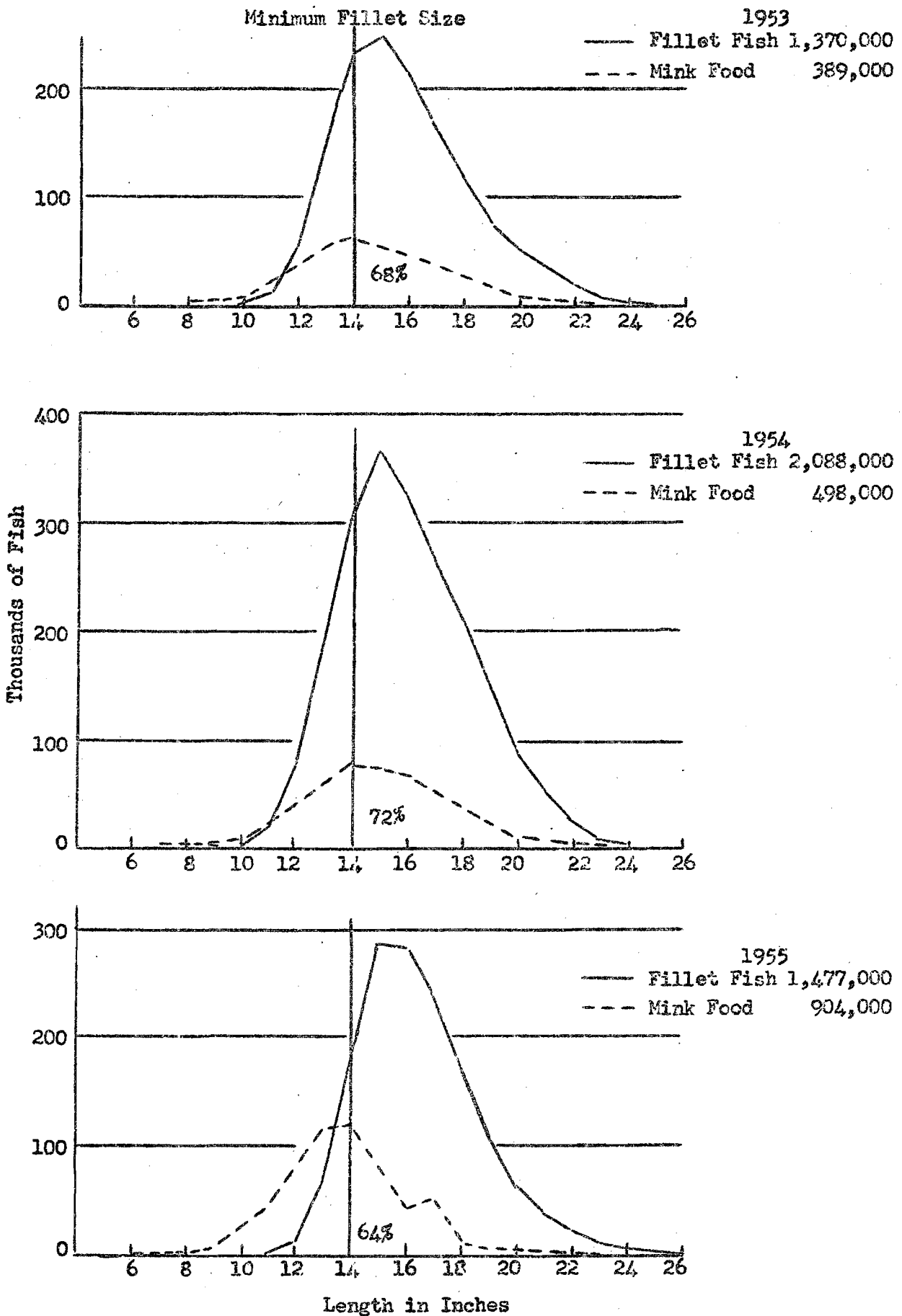
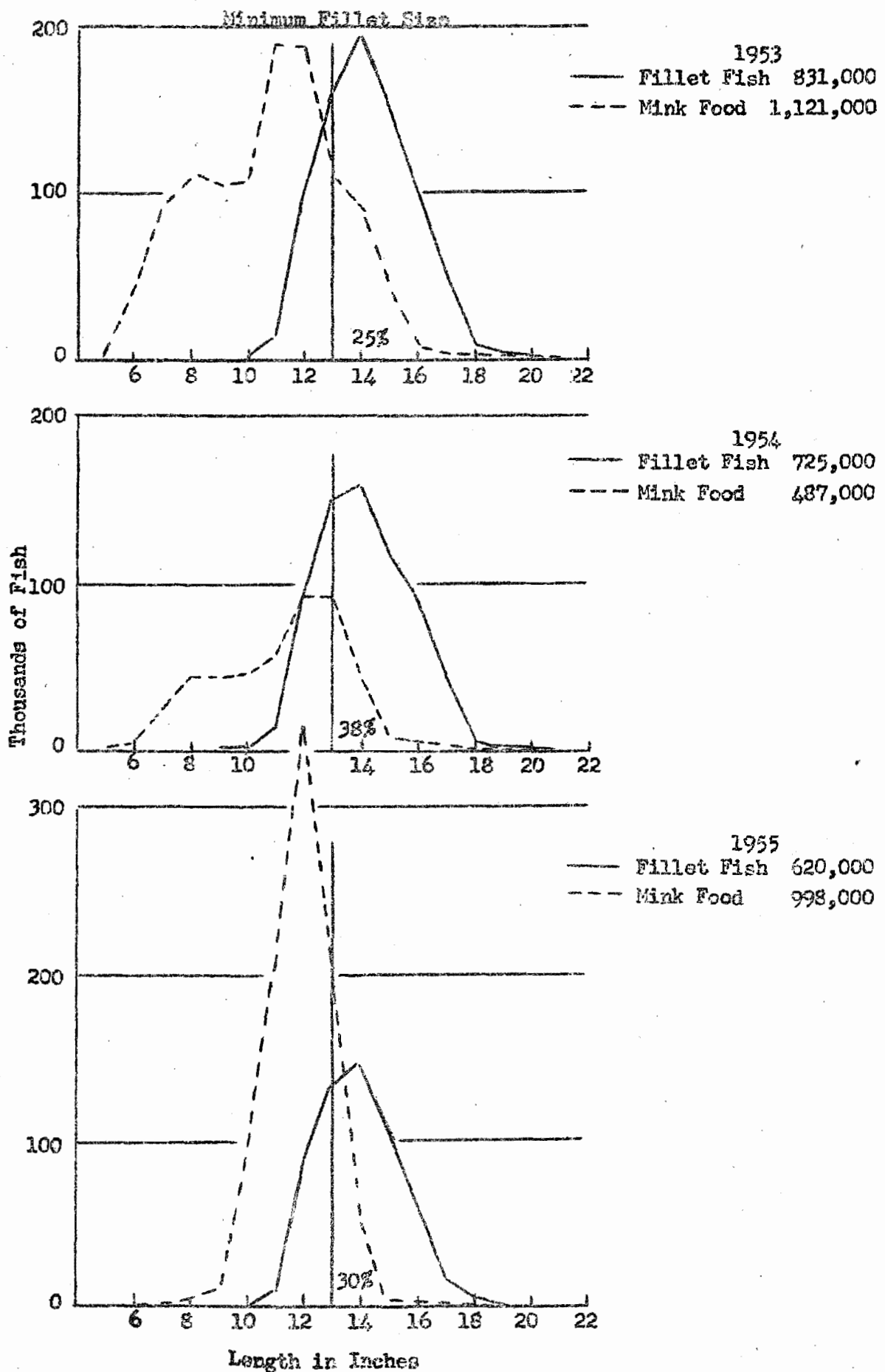


Figure 3. Weighted Length-Frequencies of English Sole Landed in Oregon, 1953-55



fillet market for rockfish in the Astoria area and to the reluctance of many of the fishermen to deliver large quantities of these fish for mink food.

Turbot was the major species, by weight, landed for mink food at all Oregon ports receiving mink food fish. Fishermen reported that the plants limited the deliveries of turbot to 40 per cent by weight of each landing.

Rex sole was the most abundant species landed, by numbers of fish, at Astoria. Deliveries of rex sole at the other Oregon trawl landing ports were comparatively limited. Turbot and rockfishes were the major species landed at those ports.

The amount of the principal fillet market soles, Dover, English, and petrale, that could be landed for mink food after June 1, 1955 was restricted by Oregon Fish Commission regulation (General Order XXVI) to 20 per cent by weight of each total landing (fillet fish + mink food). These three species in the Astoria mink food landings amounted to 20.5 per cent of the total landed weight of mink food. Very little English sole was landed at Newport and the other southern ports. The percentage of the Dover, English, and petrale soles in the total Oregon landings of mink food amounted to 16 per cent compared to 18 per cent in 1954 and 30 per cent in 1953.

The weighted size distribution, in inches, of the Dover sole found in the mink food landings compared with the weighted size distribution of Dover sole found in the fillet market landings for the years 1953-55 are shown in Figure 2. More small Dover sole were encountered in the 1955 mink food landings than in the previous two years. A smaller per cent of the Dover sole in the mink food landed in 1955 were larger than the 14-inch minimum size (required by the fillet plants) than in the previous two years (54 per cent in 1955, 72 in 1954, and 68 in 1953). The mode at 17 inches in the 1955 mink food Dover sole is due to the larger fish landed at Newport and Winchester Bay where there was no fillet market for these fish. Although the percentage by weight of Dover sole in the total mink food landings was less than in previous years, the calculated

total numbers (904,000) of Dover sole in the mink food was considerably more in 1955.

Figure 3 shows a similar presentation of the size distribution of English sole in the mink food and fillet market landings. The mode at 8 inches in the distribution of English sole in 1953 and 1954 was due to the quantities of small fish of this species landed for mink food at Newport during those years. There was very little English sole landed at ports south of Astoria last year. Vessels at these ports fished deeper waters where English sole are not generally found in order to comply with the mink food regulation. The 1955 mink food size distribution shown is almost entirely English sole landed at Astoria. Approximately 30 per cent of the mink food English sole were larger than the 13-inch minimum size required by the fillet plants. Approximately one million English sole were calculated to have been landed for mink food in 1955.

The amount of petrale sole found in the mink food landings has not been large enough to be of any real concern in the past three years.

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