DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES
HUGH M. SMITH, Commissioner

FISHERY INDUSTRIES OF THE UNITED STATES

REPORT OF THE DIVISION OF STATISTICS AND METHODS OF THE FISHERIES FOR 1918

By LEWIS RADCLIFFE
Assistant in Charge

APPENDIX X TO THE REPORT OF THE U. S. COMMISSIONER OF FISHERIES FOR 1918

Bureau of Fisheries Document No. 875

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CONTENTS.

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INTRODUCTION.

In recent years the only report of the work of this division, including the mass of detailed statistics of the fisheries collected during the preceding calendar year, has been incorporated in the annual report of the Commissioner prepared at the close of the fiscal year. That these statistics and discussions may be made available to the public at an earlier date, and for other urgent reasons, it has been deemed advisable to issue a detailed report of the work of the division at the close of each calendar year. The work of the division for the first half of the calendar year 1918, including the results of several statistical canvasses, has been dealt with in some detail in the Commissioner's report for the fiscal year ended June 30, 1918, and has been omitted from the present report. The results of a canvass of the fisheries of the Pacific Coast States for 1915 were presented in condensed form in the Commissioner's report for the fiscal year 1917. The statistics and other information obtained in this canvass are given in detail in this report.

SUMMARY OF THE WORK.

In its relations with the fishing industries in 1918 the Bureau has striven to render the largest possible measure of service in increasing the consumption of fish and in the development of markets for fishery products, particularly the little-used or neglected forms. Special attention has also been given to increasing the use of the waste products of the fisheries, such as roe and buckroe, the meat of whales and porpoises, etc., for food; the use of fish waste and waste fish for conversion into oil and fertilizer or fish meal as an animal feed; and the use of the skins of sharks and other unused aquatic forms for tanning into leather and the like. The adoption of improved methods and the discontinuance of wasteful practices have been encouraged.

The industries, particularly those engaged in canning and preserving fish by other methods, labor under a serious handicap through ignorance of the scientific principles underlying these operations, the methods being largely empirical. The Bureau has started investigations in the canning and salting of fish for the purpose of establishing the basic principles governing these operations and determining

their application to effect improvement in methods in practice, in the quality of the product, and in economy of operation. Although but recently inaugurated, these investigations give promise of yielding valuable results to the industry and clarifying our understanding of the processes, thereby enabling us to proceed more intelligently.

One of the major functions of the division is the taking of inventories of the fisheries. The importance of such work as a guide to the States in the enactment of proper legislation governing the protection of the fisheries, to mention only one of the needs for such work, should be self-evident. During the year the following statistical canvasses were made: Coastal fisheries of New York and New Jersey, exclusive of shellfish for 1917; the fisheries on Five-Fathom Bank, N. J., for 1916 and 1917; the shad fishery of the Hudson River for the years 1917 and 1918; the fisheries of Lake Pepin and Lake Keokuk for 1917; and the fisheries of the Great Lakes, Lake of the Woods, and Rainy Lake for 1917. In addition the detailed statistics of the vessel fisheries centering at Boston and Gloucester, Mass., Portland, Me., and Seattle, Wash., have been collected and the information published in the form of monthly and annual bulletins for the use of the trade. These data, together with the results of the canvass of the Great Lakes fisheries, appear in the present report. The Bureau is striving to make its statistical canvasses with sufficient frequency to cover the major geographical divisions of the fisheries once in a five-year period. To do this properly will require a somewhat larger force of statistical agents.

INCREASING CONSUMPTION OF FISHERY PRODUCTS.

The unusual demands on our food resources in 1918 afforded exceptional opportunities for educating the public to the value of fish and fishery products with which it was little acquainted. The Bureau endeavored to meet this situation and employed assistants experienced in the fisheries to assist in the development of markets and the education of the public to the merits of fish as food. It was instrumental in introducing approximately a half million pounds of Gulf fish to the markets of Nashville, Tenn., Louisville, Ky., and Indianapolis, Ind. These shipments, packed under the supervision of Government agents by the most approved methods to insure arrival in the best of condition, were made in car lots by the Gulf producers. This has resulted in enlarging the markets for fish from this region and acquainting many people with the merits of species common to the region. To effect relief for unsatisfactory shipping conditions, similar service was inaugurated between Chincoteague, Va., and the markets of Philadelphia and New York, and a number of shipments were made under supervision of Government agents.

Assistance was rendered in introducing canned river-herring products (fish, roe, and buckroe), sea herring, and gadoid buckroe to the markets of Atlanta, Ga., Birmingham and Montgomery, Ala., and Knoxville, Nashville, and Chattanooga, Tenn.; this resulted in bringing nearly 14,000 cases of these products, valued at over $54,000, to these markets.

Whaling companies were encouraged to save and market whale meat, and a placard and an economic circular were issued to aid in creating a demand for the product and in educating the housewife

how to prepare it. West-coast whaling companies have provided a cold-storage and distributing plant with a capacity of about 3,000 tons, a 500-ton freezing plant, a refrigeration steamer, and a cannery with a capacity of 50,000 cases. In 1918, 30,000 cases of the meat were canned and 195 tons of frozen meat marketed. With available equipment, an output of 50,000 cases of canned meat and 1,000 tons of frozen meat is expected during the coming season.

The following description of the methods employed in the canning of whale meat is taken from the January, 1919, Yearbook of the Pacific Fisherman:

> The equipment and method of canning are quite similar to those used in Pacific coast salmon canneries, with obvious differences in the preliminary handling. The whales for canning are hauled out on a special concrete slip, constantly flooded with fresh running water, and here the meat is removed in the same way as for freezing. After being cooled it is placed in a mild brine for about 36 hours, which removes all blood, at the same time practically eliminating the gamy taste. The strips of meat are then passed through a salmon cutter of familiar type, which cuts them into pieces the right size for 1-pound flat cans. The cans are then put through the exhaust box for 30 minutes, sealed and cooked in the retort for an hour and twenty minutes, after which they are ready for labeling and shipping.

The lack of understanding of the best ways to prepare fish for the table, of the relative merits of the different varieties of fish and fishery products, and their value as food, is to a considerable extent responsible for the lack of demand for fish. Such obstacles can best be met by education and practical demonstration. To do this, representatives of the Bureau were detailed to give lectures and demonstrations in fish cookery, beginning in May and continuing throughout the year. More than 70 demonstrations were given, the following places being visited: Seattle, Everett, Bellingham, Spokane, Yakima, and Aberdeen, Wash.; Portland and Gladstone Park, Oreg.; and San Francisco, Oakland, Berkeley, Alameda, Stockton, and Sacramento, Calif. These demonstrations were very popular with the housewives, the average attendance being about 100 persons.

The following fish and fishery products were used for demonstration purposes: Albacore, barracuda, bocaccio, bonito, carp, catfish, flounders, hake, halibut, kingfish, lingcod, chub mackerel, horse mackerel, grayfish, perch, rockfishes, sablefish, sand dab, sardine, shad, skates, skipjack, smelt, soupfin shark, sole, sturgeon, yellowtail, and heads, milts, and livers of salmon; also squid, octopus, and whale. Among the forms especially popular were shark, squid, skate, yellowtail, sablefish, flounders, sole, kingfish, mackerel, and salmon milts.

Buying of fish in the round, the viscera alone being removed, was advocated. This is cheaper and much waste is eliminated, as the head, trimmings, and bones, which are richest in flavor and are usually discarded by the dealer, are thus saved. These parts are used to make delicious soups and gravies, or, if in smaller quantity, as the foundation for a cream sauce. In thus utilizing practically every part of the fish for food, one day's supply will usually serve for two.

In place of frying, the hot-oven method of cooking was recommended. By this means practically all the unpleasant odors of cooking fish are eliminated, economy in the use of fats is effected, and time is saved in both cooking and serving. Creamed dishes, souffles, and imitation chops are made from left-over fish. Salads also are made from these, as well as from freshly steamed fish.

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controlled. Careful consideration has, therefore, been given means of measuring such factors in the laboratory and varying controlling them as investigation necessitates. Wherever requi recording thermometers and hygrometers, thermostats, pitot tu pressure and vacuum gauges, and other measuring and control devices have been installed, and measuring apparatus, such a viscosimeter, refractometer, polarimeter, colorimeter, specific-gra balances, etc., have been provided for the chemical study of proces

STUDY OF THE PRINCIPLES OF PRESERVING FISH WITH SALT.

Without waiting for the completion of the fishery produ laboratory, the Bureau immediately made arrangements for initiation of various investigations, one of which concerns the preser tion of fish with salt. The primary object of this investigation wa determine whether this useful method of preserving is necessa limited to the cooler regions of the country and to a few species whether it could by improvement be extended to other regions other fishes. A number of fundamental questions are involved in solution of this problem, namely, the factors influencing the rat penetration of brine, the maximum temperature at which saltin successful, the mode of application of the salt, the effect of impuri in the salt, the rate and nature of the decomposition which ta place in tissues before the salt reaches them, the influence of the sl fat, dressing, and cleaning, the amount of nutrients and wa removed, etc. Various brands of commercial salt were compa with chemically pure salt as a standard. In the absence of pro laboratory facilities in the Washington office, the work was initia in cooperation with the National Research Council at Johns Hopk University Medical School, Baltimore, Md., and Dr. E. V. McColl very kindly volunteered to supervise the experimental work done that institution.

Significant results were attained within a few months, it be shown that the impurities in salt, even in small quantities, hav marked effect on the process of salting and on the quality of salted product. In these experiments, squeteague were used. P sodium chloride penetrates the fish very rapidly and completely produces a soft, yellow-meated, flexible fish. Small amounts calcium chloride and magnesium chloride retard the penetration the sodium chloride, but produce a firmer, whiter fish than pure sodi chloride. As these are common, almost constant, impurities in s it would appear that they may interfere with the preservation fish in warm climates, such as obtain in our Southern States. indicated, these products also affect the quality and appearance the product. Thus it may be possible not only to bring about a m rapid and complete brining of fish in a much shorter time but a to produce salt fish possessing almost any desired degree of hardn and whiteness. Data were also sought as to the relative merits of two methods of salting fish in brine or in dry salt, the amount a rate of decomposition of protein into the end product, amino-a nitrogen, being determined. These experiments indicated that dry-salting method is the more efficient at the higher temperatu

Experiments in progress include the study of penetration of s through the skin of the fish, as influenced by the impurities in

t, relation of freshness of fish to temperature at which it can be ted, determination of highest temperature at which it is practicable salt fish, possible ways of improving methods in common practice, d trials of relative values of the different kinds of salt on the ırket.

PERIMENTS IN THE PREPARATION OF FISHERY PRODUCTS FOR THE TABLE.

Supplementing the work of the field agents engaged in giving tures and practical demonstrations of the best methods for cooking h, the Bureau equipped an experimental kitchen and employed perts to determine the best methods of preparation of new or tle-known fish and fishery products for the table.

Here a considerable number of fishery products were tried out by rious individual methods of preparation, and those best suited to e particular product selected. In some cases this information was rnished direct to the trade, in others it was assembled and published economic circulars to aid in educating the public as to the merits , and establishing larger markets for, such heretofore little-used oducts. In this manner assistance has been given in increasing the oduction and consumption of grouper, menhaden, mussels, sharks, llibees, and the roe and buckroe of fishes.

In addition, the assemblage of materials for a cookbook on fish was gun. This is now nearing completion, many of the recipes being sted in the experimental kitchen.

NEW ENGLAND VESSEL FISHERIES.

The vessel fisheries centering at Boston and Gloucester, Mass., and ortland, Me., have been in a more than usually prosperous condition ıring the past year, notwithstanding the presence of enemy sub- arines along the coast and on the fishing grounds in the summer ıd the consequent loss of a number of fishing vessels. There was a ecline in the total number of trips, but a considerable increase in the uantity and value of the products landed. The decline in the ımber of trips occurred at Boston and Portland, while there was an crease over the previous year at Gloucester. Statistics of these heries have been collected during the year by the local agents and ıblished in monthly bulletins, showing, by species and fishing ounds, the quantities and values of fishery products landed by merican and Canadian fishing vessels during the year at these ports. wo annual bulletins also have been issued, one showing the catch by onths and the other by fishing grounds.

The fishing fleet which landed fishery products at these ports ıring the calendar year 1918 included 521 sail, steam, and gasoline rew vessels. These vessels landed at Boston 2,830 trips, aggre- ating 109,476,041 pounds of fish, valued at $6,587,754; at Gloucester, 414 trips, aggregating 74,175,499 pounds, valued at $3,062,605; and Portland, 2,506 trips, aggregating 21,849,613 pounds, valued at 881,189. The total for the three ports amounted to 8,750 trips, ggregating 205,501,153 pounds of fresh and salted fish, having a alue to the fishermen of $10,531,548. This total includes 60 trips nded at these ports by 21 Canadian fishing vessels, amounting to

5,602,749 pounds of fresh fish, valued at $218,625. These fish landed in accordance with an arrangement with the Canadian Gov ment, as an emergency war measure granting reciprocal privileg fishing vessels, by which Canadian fishing vessels were permitte land their fares at American ports direct from the fishing grou Canadian fishing vessels began to utilize this privilege in April continued during the remainder of the year. The greater pa these fish, or 4,668,620 pounds, valued at $164,946, were lande Portland.

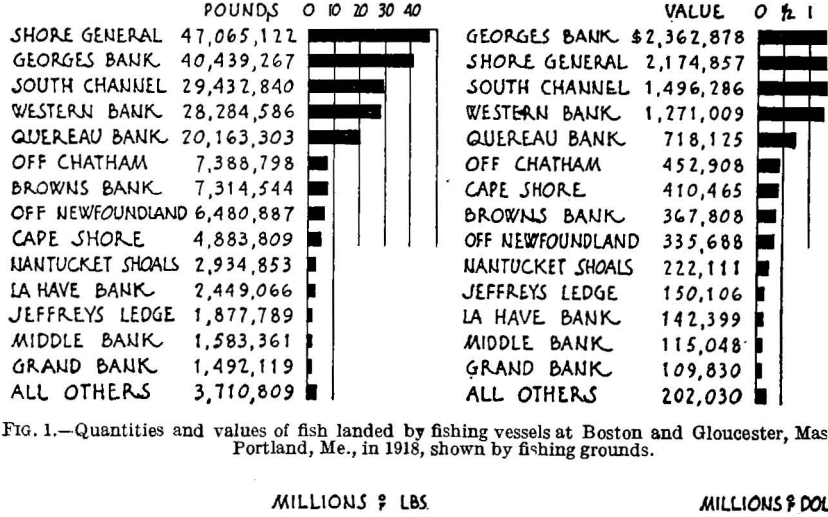


FIG. 1.—Quantities and values of fish landed by fishing vessels at Boston and Gloucester, Mas Portland, Me., in 1918, shown by fishing grounds.

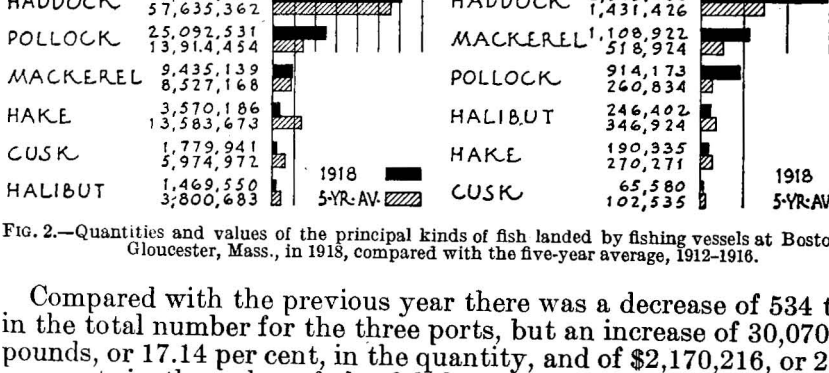


FIG. 2.—Quantities and values of the principal kinds of fish landed by fishing vessels at Bosto Gloucester, Mass., in 1918, compared with the five-year average, 1912–1916.

Compared with the previous year there was a decrease of 534 t in the total number for the three ports, but an increase of 30,070 pounds, or 17.14 per cent, in the quantity, and of $2,170,216, or 2 per cent, in the value of the fish landed. The cod catch incre 15,357,899 pounds, or 27.19 per cent, in quantity, and $1,246,37 52.57 per cent, in value; haddock, 13,116,706 pounds, or 24.49 cent, in quantity, and $682,547, or 27.12 per cent, in value; poll 12,052,828 pounds, or 83.07 per cent, in quantity, and $382,817 66.08 per cent, in value; halibut, 14,940 pounds, or 0.84 per cen quantity, and $83,048, or 37.88 per cent, in value; herring, 1,858 pounds, or 14.44 per cent, in quantity, and $162,068, or 54.27

in value; and miscellaneous products, 309,709 pounds, or 7.88 ent, in quantity, and $56,390, or 45.05 per cent, in value. There lso a considerable decrease in the catches of a number of species. catch of hake decreased 2,633,817 pounds, or 33.27 per cent, in tity, and $68,300, or 20 per cent, in value; cusk, 891,043 pounds, .10 per cent, in quantity, and $16,083, or 13.50 per cent, in value; erel, 7,283,596 pounds, or 41.75 per cent, in quantity, and ,195, or 18.23 per cent, in value; swordfish, 937,427 pounds, or) per cent, in quantity, and $68,977, or 23.60 per cent, in value. Newfoundland herring catch fell off 422,932 pounds, or 6.21 per in quantity, but increased $104,072, or 45.68 per cent, in value. quantity of tilefish landed at Boston during the year declined 1,211,450 pounds, valued at $44,743 in 1917, to 299,420 pounds, ed at $20,246 in 1918.

ie following tables present in detail, by fishing grounds and by ths, the products landed at Boston and Gloucester, Mass., and land, Me., by American and Canadian fishing vessels, for the ndar year 1918. The weights of fresh and salted fish given in e statistics represent the fish as landed from the vessels, and the es are those received by the fishermen. The grades, or sizes, n for certain species are those recognized in the trade.

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE CALENDAR YEAR 1918, SHOWN BY FISHING GROUNDS.

Fishing grounds.	Number of trips.	Cod.											
		Large (10 pounds and over).				Market (under 10 and over 2½ pounds).				Scrod (1 to 2½ pounds).			
		Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
		Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value*	*Pounds.*	*Value.*
LANDED AT BOSTON.													
East of 66° W. longitude.													
By American vessels:													
La Have Bank	31	366,795	$27,236			354,655	$18,015			67,745	$1,627		
Western Bank	180	3,854,620	255,378			2,466,376	111,026			85,077	2,457		
Quereau Bank	6	95,050	5,072			102,090	4,498			2,990	84		
Grand Bank	2	2,500	186			500	16						
St. Peters Bank	2	50,000	2,330			15,000	525						
Off Newfoundland	1							35,000	$1,400				
Cape Shore	62	289,672	22,409			322,479	15,646			53,328	1,296		
Gulf of St. Lawrence	1	6,100	390			500	25						
St. Anns Bank	1	4,285	328			31,000	1,575						
Roseway Bank	1	8,600	396			9,185	291			2,270	35		
By Canadian vessels:													
La Have Bank	1	4,200	312			9,385	384			210	4		
Western Bank	1	3,000	248			10,350	533			2,255	61		
Cape Shore	1	3,510	489			3,900	262			2,400	60		
West of 66° W. longitude.													
By American vessels:													
Browns Bank	105	1,292,415	78,559			873,050	42,131			152,472	4,291		
Georges Bank	648	12,331,918	772,387			3,693,757	189,301			189,134	4,477		
Cashes Bank	5	21,825	1,969			15,480	788			3,470	70		
Clark Bank	1	5,800	406			19,000	839			400	8		
Fippenies Bank	4	14,890	1,711			9,140	738			3,400	81		
Middle Bank	92	99,703	10,387			76,739	5,298			18,927	520		
Jeffreys Ledge	139	134,961	10,994			72,673	6,126			17,560	604		
South Channel	440	1,686,304	137,907			2,086,176	108,269			347,780	8,264		
Nantucket Shoals	105	273,826	25,827			1,029,647	51,748			135,968	3,394		
Off Chatham	270	1,096,836	83,301			1,123,608	60,423			279,059	5,946		
Bay of Fundy	3	8,700	485			34,025	1,148			1,100	22		
Seal Island	1	5,600	336			12,500	500			950	19		
South	24					205	4						

Total	2,830	21,849,086	1,453,212			12,674,977	635,575	35,000	1,400	1,397,026	34,055		
LANDED AT GLOUCESTER.													
East of 66° W. longitude.													
By American vessels:													
La Have Bank	11	195,290	7,829	2,265	$183	63,525	2,270	3,130	235	6,420	127	300	320
Western Bank	67	1,998,531	80,674	406,970	27,414	1,066,315	36,526	293,559	18,406	47,000	976	20,675	1,085
Quereau Bank	133	6,310,423	222,937	1,125,628	77,805	7,916,279	242,893	917,591	56,205	246,933	4,888	68,322	4,402
Green Bank	1	45,275	1,698	19,770	1,334	2,470	80	2,980	186			60	3
Grand Bank	16	447,625	16,370	350,500	29,011	105,030	3,208	158,703	13,216	4,795	96	25,815	2,383
St. Peters Bank	4	261,170	9,238	23,130	1,806	177,955	5,372	9,705	658	200	4		
Off Newfoundland	29												
Cape Shore	31	6,575	247			4,420	144			475	10		
Gulf of St. Lawrence	2	74,500	2,915			94,450	3,307			9,940	200		
St. Anns Bank	1	2,350	106			17,350	694			1,130	23		
The Gully	1	9,900	396			910	32			175	7		
By Canadian vessels: Western Bank	1	17,955	1,011			19,985	749			825	17		
West of 66° W. longitude.													
By American vessels:													
Browns Bank	24	1,149,355	45,602			384,712	12,886			26,950	536		
Georges Bank	116	3,481,270	144,948			878,017	31,110			31,765	712		
Middle Bank	1												
Nantucket Shoals	10												
Seal Island	5	94,235	3,534			62,255	2,023						
Shore, general	2,961	2,964,812	163,756	16,765	1,174	12,983	423	965	55			63	3
Total	3,414	17,059,266	701,261	1,945,048	138,727	10,806,656	341,717	1,386,633	88,961	376,608	7,596	115,235	7,895
LANDED AT PORTLAND.													
East of 66° W. longitude.													
By American vessels:													
La Have Bank	7	37,730	1,660			26,875	956			4,320	82		
Western Bank	14	557,555	18,210			12,775	485			660	13		
Quereau Bank	1	48,900	1,467										
Green Bank	1												
Grand Bank	4	6,290	252	1,610	113	1,815	64	590	39				
St. Peters Bank	2												
Cape Shore	7												

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE CALENDAR YEAR 1918, SHOWN BY FISHING GROUNDS—Continued.

Fishing grounds.	Number of trips.	Cod.											
		Large (10 pounds and over).				Market (under 10 and over 2½ pounds).				Scrod (1 to 2½ pounds).			
		Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT PORTLAND—contd.													
East of 66° W. longitude—Contd.													
By Canadian vessels:		*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
La Have Bank	3	30,120	$1,908	.....	.....	5,130	$186	.....	.....	65	$1	.....	.....
Western Bank	16	750,216	24,929	.....	.....	422,749	13,153	.....	.....	.....	.....	.....	.....
Off Newfoundland	1	1,000	30	.....	.....	7,900	237	.....	.....	2,100	64	.....	.....
Cape Shore	11	37,820	1,868	.....	.....	63,065	2,387	.....	.....	5,135	114	.....	.....
West of 66° W. longitude.													
By American vessels:													
Browns Bank	1	5,625	225	.....	.....	4,810	144	.....	.....	2,600	39	.....	.....
Georges Bank	7	76,700	3,560	.....	.....	15,750	618	.....	.....	1,205	24	.....	.....
Cashes Bank	39	135,513	8,574	.....	.....	59,182	2,690	.....	.....	13,597	411	.....	.....
Fippenies Bank	1	1,840	64	.....	.....	1,885	47	.....	.....	650	10	.....	.....
Platts Bank	25	57,377	4,811	.....	.....	37,151	1,897	.....	.....	6,348	159	.....	.....
Jeffreys Ledge	67	43,350	3,993	.....	.....	44,550	3,222	.....	.....	12,802	480	.....	.....
Shore, general	2,298	954,136	71,454	495	$50	534,731	31,357	1,122	$107	130,508	4,366	1,115	$60
By Canadian vessels: Seal Island	1	1,485	66	.....	.....	4,035	137	.....	.....	910	23	.....	.....
Total	2,506	2,745,657	143,071	2,105	163	1,242,403	57,580	1,712	146	185,900	5,786	1,115	60
Grand total	8,750	41,654,009	2,297,544	1,947,153	138,890	24,724,036	1,034,872	1,423,345	90,507	1,959,534	47,437	116,350	7,955

Fishing grounds.	Large (over 2½ pounds).				Scrod (1 to 2½ pounds).				Large (6 pounds and over).				Small (under 6 pounds).			
	Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT BOSTON.																
East of 66° W. longitude.																
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
By American vessels:																
La Have Bank	526,575	$31,146			70,715	$2,653			56,150	$3,121			56,501	$2,314		
Western Bank	6,628,872	296,602			1,224,120	43,041			24,305	1,252			69,955	3,158		
Quereau Bank	4,550	181											2,900	145		
Grand Bank	43,000	1,330											15,500	873		
St. Peters Bank	75,500	3,330														
Cape Shore	429,050	32,553			21,240	960			24,090	1,442			55,940	2,421		
Gulf of St. Lawrence	25,500	1,020											6,000	400		
St. Anns Bank	16,000	1,012														
Roseway Bank	4,250	206			1,000	25							1,340	40		
By Canadian vessels:																
La Have Bank	6,730	269														
Western Bank	24,500	1,694			26,250	1,017							200	16		
Cape Shore	12,400	558														
West of 66° W. longitude.																
By American vessels:																
Browns Bank	1,630,890	81,599			147,093	5,489			6,350	391			82,385	3,587		
Georges Bank	12,074,917	684,575			2,042,605	87,099			40,745	2,592			58,568	3,370		
Cashes Bank	9,230	483			2,980	65			3,155	206			15,480	628		
Clark Bank	32,000	1,220														
Fippenies Bank	19,675	1,771			670	34			2,710	304			13,045	805		
Middle Bank	559,225	43,050			20,015	910			101,597	10,074			428,799	23,610		
Jeffreys Ledge	483,870	49,135			32,030	2,073			20,013	2,352			146,620	11,141		
South Channel	19,620,165	970,040			2,238,395	72,947			575,088	35,535			651,431	33,299		
Nantucket Shoals	130,486	6,940			335	11			675	41			3,020	91		
Off Chatham	3,383,360	216,279			184,875	7,562			49,540	4,173			198,545	9,180		
Bay of Fundy	2,100	63							49,250	2,901			91,895	3,433		
Seal Island	38,000	1,615											1,230	49		
South	730	26											3,240	128		
Shore, general	169,923	10,948			9,190	433			24,225	3,265			112,628	5,001		
By Canadian vessels:																
Browns Bank	35,435	1,818			905	27			8,850	248						
Georges Bank	153,895	10,469			22,560	989							345	17		
Total	46,140,828	2,449,932			6,044,978	225,335			986,743	67,897			2,015,567	103,706		

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE CALENDAR YEAR 1918, SHOWN BY FISHING GROUNDS—Continued.

Fishing grounds.	Haddock.								Hake.							
	Large (over 2½ pounds).				Scrod (1 to 2½ pounds).				Large (6 pounds and over).				Small (under 6 pounds).			
	Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT GLOUCESTER.																
East of 66° W. longitude.																
By American vessels:	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Le Have Bank	103,348	$2,930	.....	.....	.....	.....	.....	.....	19,875	$563	.....	.....	.....	.....	.....	.....
Western Bank	1,610,578	44,967	2,170	$92	45,700	$1,264	.....	.....	272,440	7,431	15,017	$617	.....	.....	.....	.....
Quereau Bank	2,731,226	70,955	47,898	2,385	.....	.....	6,810	$238	54,333	1,467	11,545	418	.....	.....	.....	.....
Grand Bank	16,550	416	2,475	154	.....	.....	8,829	618	14,375	433	3,180	170	.....	.....	460	$25
St. Peters Bank	154,545	3,965	310	14	.....	.....	.....	.....	20,530	594	3,920	176	.....	.....	.....	.....
Cape Shore	3,690	92	.....	.....	.....	.....	.....	.....	7,870	197	.....	.....	.....	.....	.....	.....
Gulf of St. Lawrence	.....	.....	.....	.....	.....	.....	.....	.....	2,885	87	.....	.....	.....	.....	.....	.....
The Gully	70	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
By Canadian vessels: Western Bank	27,435	970	.....	.....	44,090	1,102	.....	.....	1,425	46	.....	.....	.....	.....	.....	.....
West of 66° W. longitude.																
By American vessels:																
Browns Bank	342,065	10,695	.....	.....	10,535	485	.....	.....	850	21	.....	.....	.....	.....	.....	.....
Georges Bank	2,223,175	70,985	.....	.....	361,265	11,957	.....	.....	55,495	1,517	.....	.....	150	$3	.....	.....
Seal Island	625	16	.....	.....	.....	.....	.....	.....	37,385	1,030	.....	.....	.....	.....	.....	.....
Shore, general	710,761	43,519	.....	.....	.....	.....	.....	.....	46,036	3,933	105	4	.....	.....	.....	.....
Total	7,924,068	249,512	52,853	2,645	461,590	14,808	15,639	856	533,499	17,319	33,767	1,385	150	3	460	25
LANDED AT PORTLAND.																
East of 66° W. longitude.																
By American vessels:																
La Have Bank	81,055	3,784	.....	.....	5,585	138	.....	.....	1,615	125	.....	.....	4,840	240	.....	.....
Western Bank	1,479,420	46,731	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,505	213	.....	.....
Quereau Bank	97,800	2,934	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Bank	.....	.....	.....	.....	.....	.....	.....	.....	540	16	740	33	.....	.....	.....	.....

Western Bank	2,759,597	92,009											1,180	30		
Off Newfoundland	31,200	1,326							300	9			2,900	87		
Cape Shore	228,375	9,088			5,785	110			13,970	499			24,930	787		
West of 66° W. longitude.																
By American vessels:																
Browns Bank	24,000	780			4,020	131										
Georges Bank	29,850	1,440			2,180	55			1,000	50			2,435	79		
Cashes Bank	14,170	972			1,250	48			19,615	1,101			33,659	1,178		
Fippenies Bank	860	43			300	9							145	5		
Platts Bank	34,477	2,687			1,635	57			21,351	1,621			70,149	3,107		
Jeffreys Ledge	296,712	26,801			19,830	1,003			16,894	1,435			129,545	6,267		
Shore, general	860,175	63,611			30,949	1,477			233,296	17,280			1,115,374	48,173		
By Canadian vessels: Seal Island	7,460	305			320	8										
Total	5,959,531	253,142			72,054	3,046			314,036	22,463	740	33	1,395,867	60,254		
Grand total	60,024,427	2,952,586	52,853	2,645	6,578,622	243,189	15,639	856	1,834,278	107,679	34,507	1,418	3,411,584	163,963	460	25

Fishing grounds.	Pollock.				Cusk.				Halibut.			
	Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT BOSTON.												
East of 66° W. longitude.												
By American vessels:	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
La Have Bank	32,915	$2,074			76,235	$3,391			19,273	$4,566		
Western Bank	615,275	26,959			122,071	4,747			90,655	21,429		
Quereau Bank	9,850	340			1,940	63			4,890	716		
Grand Bank					300	9			20,000	3,000		
St. Peters Bank									2,262	515		
Cape Shore	17,950	1,020			85,805	2,846			20,829	4,815		
St. Anns Bank	200	8							50	12		
Roseway Bank	990	30			12,030	283			394	74		
By Canadian vessels:												
La Have Bank	708	49			5,675	193			690	116		
Western Bank	20,275	917							260	134		
Cape Shore	900	41			2,025	51			41	6		

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE CALENDAR YEAR 1918, SHOWN BY FISHING GROUNDS—Continued.

Fishing grounds.	Pollock.				Cusk.				Halibut.			
	Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT BOSTON—continued.												
West of 66° W. longitude.												
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
By American vessels:												
Browns Bank	171,070	$3,463			317,136	$12,316			93,087	$19,611		
Georges Bank	524,333	31,458			138,847	6,495			326,780	56,536		
Cashes Bank	3,690	236			34,400	1,405			543	137		
Clark Bank	1,800	72							1,586	367		
Fippenies Bank	6,885	414			10,485	523			92	39		
Middle Bank	45,565	4,018			85,452	3,949			4,559	1,431		
Jeffreys Ledge	116,550	8,728			70,947	4,067			1,925	531		
South Channel	1,061,506	65,102			31,515	1,028			69,397	14,783		
Nantucket Shoals	181,821	9,109			1,710	54			9,321	1,561		
Off Chatham	698,802	42,824			20,085	803			12,774	2,689		
Bay of Fundy	7,960	296			12,520	387			543	122		
Seal Island	2,000	80			9,835	344			797	209		
South	1,070	37										
Shore, general	718,951	45,148			21,770	836			2,115	447		
By Canadian vessels:												
Browns Bank	35,925	1,241			23,010	717			3,472	687		
Georges Bank	14,480	605			4,610	175			620	121		
Total	4,291,471	250,269			1,088,403	44,682			686,955	134,654		
LANDED AT GLOUCESTER.												
East of 66° W. longitude.												
By American vessels:												
La Have Bank	10,685	273	100	$5	32,220	957	535	$32	42,857	5,659		
Western Bank	171,515	4,561	26,345	1,077	218,799	6,595	12,530	522	333,257	49,972	787	$94
Quereau Bank	178,745	4,641	26,568	999	63,260	1,827	340	19	75,538	9,673	7,239	799
Green Bank									10,410	1,423		
Grand Bank	845	20	210	9	765	22	435	20	167,966	21,506	2,905	347
St. Peters Bank	10,170	255	35	2	1,660	54			8,087	998		
Cape Shore	325	8			3,655	100						
The Gully	85	2							17,480	2,603		
By Canadian vessels: Western Bank	24,365	871							86	32		

West of 66° W. longitude.												
By American vessels:												
Browns Bank	45,880	1,045			49,345	1,534			1,178	189		
Georges Bank	48,055	1,359			171,417	5,162			70,954	11,516		
Seal Island	7,305	180			119,757	3,571						
Shore, general	20,249,827	648,597			16,720	483			43,851	6,937		
Total	20,747,802	661,812	53,258	2,092	677,598	20,305	13,940	593	771,664	110,508	10,931	1,240
LANDED AT PORTLAND.												
East of 66° W. longitude.												
By American vessels:												
La Have Bank	2,630	89			12,925	443			34,526	7,707		
Western Bank	42,138	982			5,915	164			24,683	4,506		
Quereau Bank	1,900	29										
Green Bank									18,144	460		
Grand Bank					370	11			86,721	15,817		
St. Peters Bank									73,289	13,929		
By Canadian vessels:												
La Have Bank	9,080	228			5,140	169			16,710	3,319		
Western Bank	66,801	1,281			11,230	281			15,053	2,325		
Off Newfoundland	12,035	361							1,628	301		
Cape Shore	5,095	179			52,955	1,896			7,580	982		
West of 66° W. longitude.												
By American vessels:												
Browns Bank	720	18			1,145	29			914	180		
Georges Bank	640	23			4,550	162			4,762	1,032		
Cashes Bank	25,380	932			253,495	9,142			3,412	770		
Fippenies Bank	390	10			1,870	42			123	25		
Platts Bank	10,443	498			66,280	2,326			3,254	641		
Jeffreys Ledge	25,430	1,401			66,979	3,573			2,400	515		
Shore, general	1,265,257	41,877			392,565	19,135			18,030	3,327		
By Canadian vessels: Seal Island	150	4			2,900	78			225	42		
Total	1,468,089	47,912			878,319	37,451			311,454	55,878		
Grand total	26,507,362	959,993	53,258	2,092	2,644,320	102,438	13,940	593	1,770,073	301,040	10,931	1,240

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE CALENDAR YEAR 1918, SHOWN BY FISHING GROUNDS—Continued.

Fishing grounds.	Mackerel.											
	Large (over 2¼ pounds).				Medium (1½ to 2¼ pounds).				Small (under 1½ pounds).			
	Fresh		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT BOSTON.												
East of 66° W. longitude.												
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
By American vessels: Cape Shore	1,366,554	$125,287	66,000	$6,930	4,485	$135						
West of 66° W. longitude.												
By American vessels:												
Georges Bank	20,000	3,000			20,000	3,000						
Middle Bank					41,385	6,783						
Jeffreys Ledge					11,298	970						
South Channel					264,180	12,510						
Nantucket Shoals	930,938	111,896										
Off Chatham	32,045	5,369			2,270	250			500	$20		
South	211,693	30,717										
Shore, general	2,434,596	273,472	108,400	17,058	917,742	147,861	30,220	$4,479	307,927	31,267	9,400	$1,504
Total	4,995,826	549,741	174,400	23,988	1,261,360	171,509	30,220	4,479	308,427	31,287	9,400	1,504
LANDED AT GLOUCESTER.												
East of 66° W. longitude.												
By American vessels: Cape Shore	43,230	4,435	1,260,563	134,733								
West of 66° W. longitude.												
By American vessels:												
Georges Bank			56,000	11,303							200	27
Middle Bank							1,600	267				
Nantucket Shoals			5,600	934	128,710	2,824	19,000	2,126	200	27		
Shore, general	55,742	9,056	51,895	8,329	114,991	9,746	891,575	138,726			25,700	3,881
Total	98,972	13,491	1,374,558	155,299	243,701	12,570	912,175	141,119	200	27	25,900	3,908

Fishing grounds.	Miscellaneous.				Total.				Grand total.	
	Fresh.		Salted.		Fresh.		Salted.			
LANDED AT BOSTON.										
East of 66° W. longitude.										
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
By American vessels:										
La Have Bank	19,955	$1,124			1,647,514	$97,267			1,647,514	$97,267
Western Bank	163,168	7,686			15,344,494	773,735			15,344,494	773,735
Quereau Bank	765	31			225,025	11,130			225,025	11,130
Grand Bank					81,800	5,414			81,800	5,414
St. Peters Bank					142,762	6,709			142,762	6,700
Off Newfoundland	[a]80,000	5,600			80,000	5,600	35,000	$1,400	115,000	7,000
Cape Shore	63,018	10,842			2,754,440	221,672	66,000	6,930	2,820,440	228,602
Gulf of St. Lawrence	3,000	186			41,100	2,021			41,100	2,021
St. Anns Bank	1,800	72			53,335	3,007			53,335	3,007
Roseway Bank	1,000	40			41,059	1,420			41,059	1,420
By Canadian vessels:										
La Have Bank					27,598	1,327			27,598	1,327
Western Bank					87,090	4,620			87,090	4,620
Cape Shore	230	12			25,406	1,479			25,406	1,479
West of 66° W. longitude.										
By American vessels:										
Browns Bank	144,720	18,596			4,910,668	276,033			4,910,668	276,033
Georges Bank	1,138,079	194,272			32,599,683	2,038,562			32,599,683	2,038,562
Cashes Bank	3,180	160			113,433	6,147			113,433	6,147
Clark Bank	1,600	48			62,186	2,960			62,186	2,960
Fippenies Bank	2,865	154			83,857	6,574			83,857	6,574

[a] For footnote see page 25.

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE CALENDAR YEAR 1918, SHOWN BY FISHING GROUNDS—Continued.

Fishing grounds.	Miscellaneous.				Total.				Grand total.	
	Fresh.		Salted.		Fresh.		Salted.			
LANDED AT BOSTON—continued.										
West of 66° W. longitude—Continued.										
By American vessels—Continued.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Middle Bank	99,795	$4,751	.....	.....	1,581,761	$114,781	.....	.....	1,581,761	$114,781
Jeffreys Ledge	87,022	3,924	.....	.....	1,195,469	100,645	.....	.....	1,195,469	100,645
South Channel	800,903	36,602	.....	.....	29,432,840	1,496,286	.....	.....	29,432,840	1,496,286
Nantucket Shoals	83,596	5,528	.....	.....	2,781,343	216,200	.....	.....	2,781,343	216,200
Off Chatham	306,499	14,089	.....	.....	7,388,798	452,908	.....	.....	7,388,798	452,908
Bay of Fundy	9,100	397	.....	.....	217,193	9,254	.....	.....	217,193	9,254
Seal Island	2,800	168	.....	.....	73,712	3,320	.....	.....	73,712	3,320
South	315,220	20,681	.....	.....	532,348	51,593	.....	.....	532,348	51,593
Shore, general	2,096,632	70,080	.....	.....	7,044,238	604,273	148,020	$23,041	7,192,258	627,314
By Canadian vessels:										
Browns Bank	10,080	454	.....	.....	348,202	17,211	.....	.....	348,202	17,211
Georges Bank	50,347	9,032	.....	.....	309,667	24,244	.....	.....	309,667	24,244
Total	5,485,374	401,529	.....	.....	109,227,021	6,556,383	249,020	31,371	109,476,041	6,587,754
LANDED AT GLOUCESTER.										
East of 66° W. longitude.										
By American vessels:										
La Have Bank	.....	.....	.....	.....	474,220	20,608	6,350	475	480,570	21,083
Western Bank	.....	.....	.....	.....	5,764,135	232,966	778,053	49,307	6,542,188	282,273
Quereau Bank	.....	.....	.....	.....	17,576,737	559,281	2,212,041	143,270	19,788,778	702,551
Green Bank	.....	.....	.....	.....	58,155	3,201	22,810	1,523	80,965	4,724
Grand Bank	.....	.....	.....	.....	757,951	42,071	553,512	45,953	1,311,463	88,024
St. Peters Bank	.....	.....	.....	.....	634,317	20,480	37,100	2,656	671,417	23,136
Off Newfoundland	[a] 81,800	4,908	[a] 6,225,024	$321,365	81,800	4,908	6,225,024	321,365	6,306,824	326,273
Cape Shore	.....	.....	.....	.....	70,240	5,233	1,260,563	134,733	1,330,803	139,966
Gulf of St. Lawrence	.....	.....	.....	.....	181,775	6,509	.....	.....	181,775	6,509
St. Anns Bank	.....	.....	.....	.....	20,830	823	.....	.....	20,830	823
The Gully	.....	.....	.....	.....	28,620	3,042	.....	.....	28,620	3,042
By Canadian vessels: Western Bank	.....	.....	.....	.....	136,166	4,798	.....	.....	136,166	4,798
West of 66° W. longitude.										
By American vessels:										

Georges Bank					7,321,503	279,208	30,700	11,330	7,378,203	280,399
Middle Bank							1,600	267	1,600	267
Nantucket Shoals					128,910	2,851	24,600	3,060	153,510	5,911
Seal Island					321,562	10,354			321,562	10,354
Shore, general	2,218,904	40,494	a7,600	164	26,434,627	926,944	994,668	152,335	27,429,295	1,079,279
Total	2,300,704	45,402	6,232,624	321,529	62,002,478	2,196,331	12,173,021	866,274	74,175,499	3,062,605
LANDED AT PORTLAND.										
East of 66° W. longitude										
By American vessels:										
La Have Bank	920	132			213,021	15,356			213,021	15,356
Western Bank	5,970	143			2,137,621	71,447			2,137,621	71,447
Quereau Bank	900	14			149,500	4,444			149,500	4,444
Green Bank					18,144	460			18,144	460
Grand Bank	180	47			95,916	16,207	2,940	185	98,856	16,392
St. Peters Bank					86,739	14,529			86,739	14,529
Cape Shore	12,693	2,487			184,878	15,251	48,200	4,820	233,078	20,071
By Canadian vessels:										
La Have Bank	5,328	1,105			80,363	7,366			80,363	7,366
Western Bank	10,201	128			4,037,027	134,136			4,037,027	134,136
Off Newfoundland					59,063	2,415			59,063	2,415
Cape Shore	220	8			474,082	20,347			474,082	20,347
West of 66° W. longitude.										
By American vessels:										
Browns Bank	970	25			44,804	1,571			44,804	1,571
Georges Bank	12,582	2,430			151,654	9,473			151,654	9,473
Cashes Bank	37,455	794			601,728	26,612			601,728	26,612
Fippenics Bank					8,063	255			8,063	255
Platts Bank	3,431	104			311,896	17,908			311,896	17,908
Jeffreys Ledge	23,828	771			682,320	49,461			682,320	49,461
Shore, general	6,432,025	105,995			12,439,637	467,879	3,932	385	12,443,569	468,264
By Canadian vessels: Seal Island	600	19			18,085	682			18,085	682
Total	6,547,303	114,202			21,794,541	875,799	55,072	5,390	21,849,613	881,189
Grand total	14,333,381	564,133	6,232,624	321,529	193,024,040	9,628,513	12,477,113	903,035	205,501,153	10,531,548

a Herring. Other items under "Miscellaneous" include alewives, 97 pounds, value $2; bluebacks, 16,905 pounds, value $696; bluefish, 4 pounds, value $1; bonito, 2,100 pounds, value $210; butterfish, 19,257 pounds, value $2,053; catfish or wolf fish, 233,371 pounds, value $7,768; eels, 1,620 pounds, value $88; flounders, 2,269,807 pounds, value $93,800; goosefish, 1,210 pounds, value $18; herring, 8,602,538 pounds, value $128,645; redfish, 160,889 pounds, value $4,363; salmon, 288 pounds, value $59; shad, 29,807 pounds, value $2,984; sharks, 55,906 pounds, value $1,754; skates, 179,726 pounds, value $3,958; smelt, 27,535 pounds, value $2,978; sturgeon, 4,857 pounds, value $435; swordfish, 1,034,091 pounds, value $223,192; tilefish, 299,420 pounds, value $20,246; whiting, 10,460 pounds, value $100; blackfish, 200 pounds, value $2; porpoise, 175 pounds, value $3; lobster, 502 pounds, value $119; squid, 100 pounds, value $6; livers, 1,120,331 pounds, value $52,363; sounds, 13,704 pounds, value $795; spawn, 83,166 pounds, value $6,790; and tongues, 3,515 pounds, value $197.

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE YEAR 1918, SHOWN BY MONTHS.

Months.	Number of trips.	Cod.											
		Large (10 pounds and over).				Market (under 10 and over 2½ pounds).				Scrod (1 to 2½ pounds).			
		Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT BOSTON.		*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
January	130	701,631	$63,935	.....	.....	623,320	$40,452	.....	.....	172,201	$4,954	.....	.....
February	167	3,112,655	231,856	.....	.....	533,886	41,727	.....	.....	72,720	2,250	.....	.....
March	239	3,488,862	210,086	.....	.....	672,728	36,275	.....	.....	61,784	1,585	.....	.....
April	193	3,982,163	184,645	.....	.....	720,936	28,631	35,000	$1,400	59,078	1,249	.....	.....
May	265	2,187,848	107,883	.....	.....	1,398,439	52,877	.....	.....	160,954	3,844	.....	.....
June	224	1,339,123	92,171	.....	.....	1,502,970	69,902	.....	.....	150,343	3,273	.....	.....
July	337	1,413,700	97,351	.....	.....	1,933,329	91,230	.....	.....	143,452	3,183	.....	.....
August	367	1,413,906	105,432	.....	.....	1,421,162	71,707	.....	.....	187,554	5,014	.....	.....
September	269	1,207,809	108,218	.....	.....	1,305,888	69,963	.....	.....	176,857	3,802	.....	.....
October	250	886,512	78,668	.....	.....	832,055	45,354	.....	.....	83,855	1,641	.....	.....
November	231	1,171,679	86,881	.....	.....	925,755	42,910	.....	.....	63,833	1,417	.....	.....
December	158	943,198	86,086	.....	.....	804,509	44,547	.....	.....	64,395	1,843	.....	.....
Total	2,830	21,849,086	1,453,212	.....	.....	12,674,977	635,575	35,000	1,400	1,397,026	34,055	.....	.....
LANDED AT GLOUCESTER.													
January	171	25,589	2,642	.....	.....	5,340	267	.....	.....	3,210	32	.....	.....
February	86	158,302	12,114	.....	.....	20,760	1,322	.....	.....	2,340	78	.....	.....
March	411	1,169,496	59,542	.....	.....	186,515	6,963	.....	.....	2,545	50	.....	.....
April	492	4,611,343	196,271	12,530	$877	614,699	20,802	10,025	577	29,425	614	80	$3
May	441	3,324,958	120,267	16,345	1,062	2,463,628	79,710	33,963	1,868	72,105	1,444	.....	.....
June	170	2,546,326	91,748	722,985	47,691	2,687,531	81,500	55,448	33,304	89,391	1,769	27,250	1,471
July	128	2,135,997	78,088	493,903	31,958	2,360,963	72,257	359,668	20,495	83,272	1,631	39,882	2,246
August	77	1,535,690	54,450	165,860	11,438	1,619,180	48,692	120,816	7,538	48,385	968	4,935	287
September	76	682,275	25,007	380,475	30,431	508,340	16,801	181,220	13,592	24,210	540	8,330	586
October	308	283,527	21,271	125,775	12,552	44,465	1,626	98,038	8,979	2,500	84	23,000	2,185
November	647	427,532	22,410	27,175	2,718	249,360	9,906	27,455	2,608	14,330	288	11,758	1,117
December	407	158,231	11,451	.....	.....	45,875	1,871	.....	.....	4,895	98	.....	.....
Total	3,414	17,059,266	701,261	1,945,048	138,727	10,806,656	341,717	1,386,633	88,961	376,608	7,596	115,235	7,895

January	125	51,613	6,283	.....	.....	75,532	7,938	.....	.....	24,684	1,678	.....	.....
February	125	81,336	6,755	.....	.....	68,573	5,144	.....	.....	12,982	616	.....	.....
March	234	143,628	7,448	1,610	113	79,500	4,131	590	39	15,897	423	.....	.....
April	221	362,463	14,031	.....	.....	136,999	4,316	.....	.....	32,490	525	.....	.....
May	346	340,156	11,913	.....	.....	284,972	9,158	.....	.....	13,432	212	.....	.....
June	318	547,840	20,204	.....	.....	20,339	902	.....	.....	5,010	98	.....	.....
July	152	610,213	27,986	.....	.....	24,544	1,350	.....	.....	5,398	173	.....	.....
August	162	207,625	13,671	.....	.....	241,435	8,079	.....	.....	6,709	140	.....	.....
September	173	93,328	8,120	495	50	44,096	2,556	1,122	107	10,957	332	1,115	60
October	234	110,365	9,238	.....	.....	95,457	4,429	.....	.....	16,744	412	.....	.....
November	217	105,401	8,773	.....	.....	79,583	3,791	.....	.....	15,393	385	.....	.....
December	199	91,686	9,649	.....	.....	91,330	5,776	.....	.....	26,144	794	.....	.....
Total	2,506	2,745,657	143,071	2,105	163	1,242,403	57,580	1,712	146	185,900	5,786	1,115	60
Grand total	8,750	41,654,009	2,297,544	1,947,153	138,899	24,724,035	1,034,872	1,423,345	90,507	1,959,534	47,437	116,350	7,955
Grounds E. of 66° W. long	654	15,527,557	708,519	1,929,893	137,666	13,334,418	465,539	1,421,258	90,345	546,448	12,246	115,235	7,895
Grounds W. of 66° W. long	8,096	26,126,452	1,589,025	17,260	1,224	11,389,618	569,333	2,087	162	1,413,086	35,191	1,115	60
Landed at Boston in 1917	2,962	11,366,216	685,115	.....	.....	11,905,068	507,939	.....	.....	1,872,806	40,008	.....	.....
Landed at Gloucester in 1917	3,074	9,983,851	357,429	2,894,581	149,756	10,168,146	270,762	3,327,379	157,573	420,291	5,038	279,406	10,226
Landed at Portland in 1917	3,248	2,452,959	122,029	63,420	3,499	1,386,475	52,685	8,935	428	317,025	8,356	.....	.....

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE YEAR 1918, SHOWN BY MONTHS—Continued.

Months.	Haddock.								Hake.							
	Large (over 2½ pounds).				Scrod (1 to 2½ pounds).				Large (6 pounds and over).				Small (under 6 pounds).			
	Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT BOSTON.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
January	2,516,592	$204,155			733,713	$39,962			5,063	$731			58,729	$5,208		
February	3,739,185	271,190			753,005	34,332			8,050	357			30,876	2,669		
March	4,658,010	288,361			784,125	33,915			3,145	335			40,885	2,516		
April	3,501,365	128,652			542,875	14,507			2,260	181			16,560	752		
May	3,036,590	123,604			721,820	13,740			48,560	2,808			120,475	4,566		
June	2,174,983	127,129			458,355	15,824			25,175	1,221			44,420	1,922		
July	3,344,996	149,799			368,405	11,348			158,723	8,456			139,045	7,964		
August	4,204,206	184,969			205,780	7,033			183,475	9,718			214,168	11,663		
September	5,985,043	258,267			426,353	13,179			191,819	13,607			195,102	10,944		
October	5,075,598	240,521			424,725	14,369			160,915	12,208			358,358	16,872		
November	4,516,580	225,772			296,862	9,837			156,901	12,331			449,089	17,253		
December	3,387,680	245,513			328,960	17,289			47,657	5,854			317,860	21,317		
Total	46,140,828	2,449,932			6,044,978	225,335			986,743	67,897			2,015,567	103,706		
LANDED AT GLOUCESTER.																
January	43,288	3,284							24,752	2,953						
February	55,322	4,538			14,320	732			6,302	469			150	3		
March	794,639	33,857			175,235	6,209										
April	1,720,958	54,053			181,865	5,493			1,340	34	185	$7				
May	1,279,061	34,858	200	$8	380	8			19,763	494	877	31				
June	391,568	10,337	14,110	622					47,820	1,225	10,130	355				
July	1,208,374	31,261	20,545	924			6,810	$238	160,345	4,329	11,665	473				
August	1,219,290	30,544	2,230	100					160,295	4,378	4,070	183				
September	572,960	15,813	7,480	411	42,600	1,172			93,800	2,826	4,195	191				
October	166,979	7,883	1,575	110			8,829	618	1,862	79						
November	388,706	16,789	6,713	470	45,290	1,132			17,220	532	2,645	145			460	$25
December	82,923	6,295			1,900	62										
Total	7,924,068	249,512	52,853	2,645	461,590	14,808	15,639	856	533,499	17,319	33,767	1,385	150	3	460	25

January																
February	213,117	20,720			10,687	610			2,606	271			34,041	2,114		
March	141,946	10,420			5,976	283			12,937	936	740	33	65,615	3,376		
April	803,893	30,755			10,604	311			20,020	1,074			30,231	863		
May	1,197,719	41,899			9,112	220			11,588	597			60,598	1,864		
June	1,451,422	44,339			1,312	39			11,989	655			48,601	1,681		
July	754,062	26,786			433	18			11,153	664			38,096	1,586		
August	600,551	21,335			219	10			20,341	1,180			80,124	2,912		
September	33,497	1,927			1,053	46			67,848	5,875			267,678	13,237		
October	276,854	13,814			9,813	371			78,860	5,631			407,054	15,270		
November	176,345	11,115			5,151	186			55,767	3,368			206,455	7,449		
December	241,574	20,590			12,215	517			16,744	1,719			136,315	8,365		
Total	5,959,531	253,142			72,054	3,046			314,036	22,463	740	33	1,395,867	60,254		
Grand total	60,024,427	2,952,586	52,853	2,645	6,578,622	243,189	15,639	856	1,834,278	107,679	34,507	1,418	3,411,584	163,963	460	25
Grounds E. of 66° W. long	17,136,196	650,701	52,853	2,645	1,444,685	50,320	15,639	856	520,158	17,609	34,402	1,414	252,896	10,812	460	25
Grounds W. of 66° W. long	42,888,231	2,301,885			5,133,937	192,869			1,314,120	90,070	105	4	3,158,688	153,151		
Landed at Boston in 1917	34,042,297	1,788,206			11,474,315	395,211			1,314,469	72,879			3,665,866	157,661		
Landed at Gloucester in 1917	2,585,187	92,977	159,493	4,899	64,715	699	600	16	733,856	21,555	72,202	2,241	1,570	56		
Landed at Portland in 1917	4,981,768	225,784			246,460	8,910			374,655	22,527	880	34	1,749,139	64,346	2,009	86

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE YEAR 1918, SHOWN BY MONTHS—Continued.

Months.	Pollock.				Cusk.				Halibut.			
	Fresh.		Salted.		Fresh.		Salted.		Fresh.		Salted.	
LANDED AT BOSTON.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
January	92,987	$7,011			98,422	$5,312			6,396	$2,144		
February	138,712	11,801			65,957	3,726			38,017	10,251		
March	104,765	7,489			78,085	3,815			18,911	5,082		
April	173,530	7,793			84,694	2,897			30,946	7,179		
May	342,767	13,793			191,165	5,385			187,124	33,482		
June	313,422	15,682			48,495	1,703			66,297	9,751		
July	634,543	35,563			118,481	4,439			102,178	13,802		
August	733,714	50,077			44,817	2,373			64,337	11,587		
September	541,408	40,773			58,295	2,629			89,378	16,012		
October	525,035	29,133			93,255	3,768			31,408	7,999		
November	510,183	21,274			57,499	2,065			31,372	9,364		
December	180,405	9,880			149,238	6,570			20,591	8,001		
Total	4,291,471	250,269			1,088,403	44,682			686,955	134,654		
LANDED AT GLOUCESTER.												
January	297,166	27,069										
February	15,257	1,157			13,684	737			776	146		
March	255,719	14,519			22,725	784			12,184	2,061		
April	190,214	8,172	4,990	$115	36,460	706	390	$17	46,642	6,772		
May	1,208,102	28,358			151,547	4,130			84,707	14,623		
June	669,746	15,631	28,408	1,082	25,570	763	85	3	242,230	32,500	2,663	$276
July	104,412	2,833	14,360	646	207,736	6,893	11,005	443	219,843	31,481	3,625	412
August	90,630	2,257	5,310	239	105,420	2,848	1,880	95	75,915	10,036	85	7
September	38,270	1,045	190	10	77,406	2,266	580	35	84,383	12,091	4,500	540
October	5,817,544	176,473			21,175	729			4,898	766	40	3
November	7,220,356	216,921			10,220	327			86	32	18	2
December	4,849,386	167,377			3,655	122						
Total	20,747,802	661,812	53,258	2,092	677,598	20,305	13,940	593	771,664	110,508	10,931	1,240
LANDED AT PORTLAND.												
January	21,455	1,903			34,243	2,636			127	19		
February	20,380	1,752			31,795	2,435			9,119	2,145		
March	77,276	3,830			78,470	4,035			14,783	2,365		

April	[illegible]	[illegible]			[illegible]	[illegible]			[illegible]	[illegible]		
May	184,174	4,163			56,272	1,501			9,276	1,728		
June	334,912	5,920			25,738	1,000			49,603	8,168		
July	189,270	5,377			58,925	2,889			16,063	2,953		
August	21,389	1,118			48,501	2,069			27,085	5,468		
September	38,657	2,193			75,612	3,858			81,779	14,223		
October	222,365	9,421			128,618	5,147			59,498	9,213		
November	174,494	6,435			94,982	3,173			25,608	6,630		
December	39,125	1,644			64,337	3,544			2,053	473		
Total	1,468,089	47,912			878,319	37,451			311,454	55,878		
Grand total	26,507,362	959,993	53,258	2,092	2,644,320	102,438	13,940	593	1,770,073	301,040	10,931	1,240
Grounds E. of 66° W. long	1,235,477	45,218	53,258	2,092	714,975	24,102	13,940	593	1,093,359	176,595	10,931	1,240
Grounds W. of 66° W. long	25,271,885	914,775			1,929,345	78,336			676,714	124,445		
Landed at Boston in 1917	4,008,279	178,544			2,052,048	71,416			490,478	80,041		
Landed at Gloucester in 1917	9,137,659	354,119	39,870	1,204	577,148	12,821	20,405	608	907,770	96,373	42,364	3,604
Landed at Portland in 1917	1,321,572	45,389	412	12	896,202	34,198	3,500	71	325,452	39,214		

QUANTITIES AND VALUES OF CERTAIN FISHERY PRODUCTS LANDED AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., BY AMERICAN AND CANADIAN FISHING VESSELS DURING THE YEAR 1918, SHOWN BY MONTHS—Continued.

Months.	Miscellaneous.				Total				Grand total	
	Fresh		Salted		Fresh		Salted			
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
LANDED AT BOSTON.										
January	75,980	$3,682			5,085,040	$377,606			5,085,040	$377,606
February	121,787	8,187			8,609,850	618,346			8,609,850	618,346
March	383,220	14,565			10,284,520	604,024			10,284,520	604,024
April	381,079	16,869			9,485,480	393,475	55,000	$1,400	9,540,480	394,875
May	874,539	27,944			9,487,194	421,359			9,487,194	421,359
June	478,222	16,719			8,690,872	555,143	46,000	6,930	8,736,872	562,073
July	795,893	97,445			11,494,346	764,288	148,400	17,058	11,642,746	781,346
August	923,779	132,500			10,144,665	669,047			10,144,665	669,047
September	300,342	20,871			11,491,694	603,163	39,620	5,983	11,531,314	609,146
October	449,155	25,941			9,195,838	523,409			9,195,838	523,409
November	324,159	17,829			8,620,246	468,406			8,620,246	468,406
December	371,213	15,957			6,647,270	468,217			6,647,270	468,217
Total	5,485,374	404,529			109,227,021	6,556,383	249,020	31,371	109,476,041	6,587,754
LANDED AT GLOUCESTER.										
January	106,638	7,988	3,131,800	$166,684	505,983	44,245	3,131,800	166,684	3,637,783	210,929
February	142,045	8,518	1,649,238	79,181	429,258	29,814	1,649,238	79,181	2,078,496	108,995
March	64,115	2,444	560,776	28,577	2,083,173	126,429	560,776	28,577	2,643,949	155,006
April					7,462,946	292,917	28,200	1,596	7,491,146	294,513
May	1,578,546	19,806			10,191,144	310,453	51,785	2,909	10,242,929	313,452
June	304,389	4,386			7,008,801	244,294	2,021,642	219,537	9,730,443	463,831
July	6,600	83	7,600	104	6,301,383	230,566	1,789,573	184,540	8,290,956	415,106
August					5,003,455	166,350	401,181	36,526	5,404,636	202,876
September					2,120,244	77,561	721,135	68,003	2,845,379	145,564
October					6,368,119	213,203	258,257	24,623	6,626,376	237,826
November	6,500	910			8,386,226	271,906	76,224	7,485	8,471,450	279,051
December	31,871	1,257	874,210	46,923	5,179,736	188,533	874,210	46,923	6,052,946	235,456
Total	2,300,704	45,402	6,232,624	321,529	62,002,478	2,190,331	12,173,021	866,274	74,175,499	3,002,605
LANDED AT PORTLAND.										
January	55,911	1,735			302,837	34,099			302,837	34,099
February	64,692	2,110			549,328	43,672			549,328	43,672
March	50,461	1,473			602,579	38,730	2,940	185	605,519	38,908

June	3,135,678	44,107			5,837,704	142,759	48,200	4,820	[illegible]	[illegible]
July	657,624	10,541			2,386,495	83,797			2,386,495	83,797
August	40,399	4,611			1,511,342	86,099	1,200	168	1,512,542	86,267
September	36,773	3,002			972,634	84,580	2,732	217	975,366	84,797
October	59,649	3,305			1,470,691	76,807			1,470,691	76,807
November	43,136	1,914			986,601	53,818			986,601	53,818
December	44,176	1,491			765,699	54,562			765,699	54,562
Total	6,547,303	114,202			21,794,541	875,799	55,072	5,390	21,849,613	881,189
Grand total	14,333,381	564,133	6,232,624	321,529	193,024,040	9,628,513	12,477,113	903,035	205,501,153	10,531,548
Grounds E. of 66° W. long	451,148	34,565	6,225,024	321,365	53,872,923	2,341,270	11,247,593	712,617	65,120,516	3,053,887
Grounds W. of 66° W. long	13,882,233	529,568	7,600	164	139,151,117	7,287,243	1,229,520	190,418	140,380,637	7,477,661
Landed at Boston in 1917	6,615,341	425,826			98,154,629	5,122,568	495,510	43,872	98,650,139	5,166,440
Landed at Gloucester in 1917	3,404,964	50,268	6,321,810	212,317	40,062,098	1,366,350	18,072,846	1,085,134	58,134,944	2,451,484
Landed at Portland in 1917	3,907,240	72,267			18,566,377	739,278	79,126	4,130	18,645,503	743,408

[a] Includes herring from Newfoundland, 161,800 pounds frozen, value $10,508, and 6,225,024 pounds, salted, value $321,365.

The fishery products landed at Boston and Gloucester, Mass., a Portland, Me., by fishing vessels each year are taken principally fro fishing grounds lying off the coast of the United States. In t calendar year 1918, 68.10 per cent of the quantity and 70.86 per ce of the value of the catch landed at these ports by American a Canadian fishing vessels were taken from these grounds; 4.36 per ce of the quantity and 4.70 per cent of the value, consisting chiefly herring, were taken from fishing banks off the coast of Newfoun land; and 27.52 of the quantity and 24.43 per cent of the value fro fishing grounds off the Canadian Provinces. Newfoundland herri constituted 3.10 per cent of the quantity and 3.15 per cent of t value of the fishery products landed at these ports during the ye The herring were taken on the treaty coast of Newfoundland, and t cod and other species from that region were obtained from fishi banks on the high seas. All fish caught by American fishing vess off the Canadian Provinces were from offshore fishing grounds. T catch from each of these regions is given in detail in the followi table:

QUANTITY AND VALUE OF FISH LANDED BY AMERICAN AND CANADIAN FISHI VESSELS AT BOSTON AND GLOUCESTER, MASS., AND PORTLAND, ME., IN 19 FROM GROUNDS OFF THE COAST OF THE UNITED STATES, NEWFOUNDLAND, A CANADIAN PROVINCES.

Species.	United States.		Newfoundland.		Canadian Provinces.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Cod:								
Fresh	38,747,186	$2,186,911	1,131,625	$39,770	28,458,768	$1,153,172	68,337,579	$3,379,
Salted	20,525	1,448	627,863	50,149	2,838,460	185,755	3,486,848	237,
Haddock:								
Fresh	47,975,763	2,492,810	334,245	10,967	18,293,041	691,998	66,603,049	3,195,
Salted	.....	.....	11,614	786	56,878	2,715	68,492	3,
Hake:								
Fresh	4,434,193	242,142	54,145	2,012	757,524	27,488	5,245,862	271,
Salted	105	4	8,300	404	26,562	1,035	34,967	1,
Pollock:								
Fresh	25,262,430	914,511	23,050	636	1,221,882	44,846	26,507,362	959,
Salted	.....	.....	245	11	53,013	2,081	53,258	2,
Cusk:								
Fresh	1,796,853	74,343	3,095	96	844,372	27,999	2,644,320	102,
Salted	.....	.....	435	20	13,505	573	13,940	
Halibut:								
Fresh	675,692	124,194	388,507	57,949	705,874	118,897	1,770,073	301,
Salted	.....	.....	2,905	347	8,026	893	10,931	1,
Mackerel:								
Fresh	5,966,808	708,595	.....	.....	1,615,606	145,044	7,582,414	853,
Salted	1,201,290	188,802	.....	.....	1,374,763	146,483	2,576,053	335,
Herring:								
Fresh	8,602,538	128,645	161,800	10,508	.....	.....	8,764,338	139,
Salted	7,600	164	6,225,024	321,365	.....	.....	6,232,624	321,
Swordfish: Fresh	974,864	209,095	180	47	59,047	14,050	1,034,091	223,
Tilefish: Fresh	299,420	20,246	.....	.....	.....	.....	299,420	20,
Miscellaneous: Fresh	4,002,011	171,395	.....	.....	233,521	10,147	4,235,532	181,
Total	139,967,278	7,463,305	8,973,033	495,067	56,560,842	2,573,176	205,501,153	10,531,

Cod.—In 1918 the fishing fleet landing fish at Boston, Gloucest and Portland was considerably larger than in the previous ye There were 5 vessels in the salt bank fishery and 123 in the mark fishery landing their fares of cod and other ground fish at these por Large quantities of cod were also landed by vessels fishing on t shore grounds. The total catch of cod landed at these ports duri the year amounted to 71,824,427 pounds, valued at $3,617,205, which 68,337,579 pounds, valued at $3,379,853, were fresh, a 3,486,848 pounds, valued at $237,352, were salted. Cod ranked fi in importance both in quantity and value among the various speci landed.

Haddock.—The catch of haddock for the year ranked second to at of cod, the total catch amounting to 66,671,541 pounds, valued $3,199,276, all of which was landed fresh except 68,492 pounds, ılued at $3,501. The greater part of the catch was taken on ɔorges Bank and in South Channel.

Hake.—The yield of hake has fallen off very much in the past few ıars. In 1918 the catch amounted to 5,280,829 pounds, valued at ?73,085, all landed fresh except 34,967 pounds, salted, valued at ,443. There was a decline of 2,633,817 pounds, or over 33 per nt, in quantity, and $68,300, or 20 per cent, in value as compared ith the previous year. In 1916 over 13,000,000 pounds of hake ere landed at these ports, and in 1910 the receipts at Boston and loucester were nearly 20,000,000 pounds.

Pollock.—The pollock catch was much larger than usual, the ıantity landed amounting to 26,560,620 pounds, valued at $962,085, l landed fresh except 53,258 pounds, salted, valued at $2,092.

Cusk.—The quantity of cusk landed was small as compared with cent previous years, amounting to only 2,658,260 pounds, valued ; $103,031, of which 13,940 pounds, valued at $593, were salted. he catch of this species is usually from upwards of three million to ɔwards of six million pounds.

Halibut.—The yield of halibut was 1,781,004 pounds, valued at 302,280, which was all landed fresh except 10,931 pounds, salted, alued at $1,240. There was an increase in quantity over the revious year of less than 1 per cent, but an increase in value of 37.88 er cent.

Mackerel.—The total catch of fresh mackerel taken by the American shing fleet in 1918 was 69,314 barrels, compared with 111,932 arrels the previous year, a decrease of 42,618 barrels. The output f salted mackerel was 13,030 barrels, as compared with 32,162 arrels the previous year, a decrease of 19,132 barrels. The quantity f mackerel landed at Boston, Gloucester, and Portland by the fishing eet during the year was 10,158,467 pounds, valued at $1,188,924, of hich 7,582,414 pounds, valued at $853,639, were fresh, and 2,576,053 ounds, valued at $335,285, were salted. This quantity includes 9,152 pounds of fresh mackerel, valued at $2,423, from the Cape hore, landed by Canadian vessels.

The southern mackerel fleet numbered about 35 sail of seiners and 25 sail of netters. The seiners had a light catch, and reported onsiderable quantities of mackerel, but that they were wild, chasing ve feed, and therefore hard to catch. They did not school much at ght, but mostly during the day. The first seiner arrived at New ork on May 6 with 13,000 large and medium mackerel, which were ld at 18 to 20 cents per pound. These fish were taken in 34 fathoms f water. The netters did not land as many mackerel as the previous ear, but, owing to the higher prices received, they did well financially. he mackerel landed by the southern fleet this year were all large nd medium fish and sold at 13 to 20 cents per pound, according to ıarket conditions.

The Cape Shore fleet numbered 38 sail vessels, being a little larger ıan the previous year. No vessel made more than one trip. A rge body of fish was reported and all the vessels returned with good ıtches. The catch taken on the Cape Shore amounted to 1,689,000 ounds of fresh mackerel and 7,558 barrels salted, compared with 229,900 pounds fresh and 7,131 barrels salted the previous year.

The first arrival from the Cape Shore was on June 8, and consist of 50,000 large and medium fresh mackerel, which sold at 10½ cen per pound. One schooner, on her Cape Shore mackerel trip, obtain 95,000 pounds fresh and 375 barrels of salted mackerel, and stock $15,665, the crew sharing $343 each. This is said to be the large stock ever made on a single mackerel trip.

Swordfish.—The quantity of swordfish landed during the year w 1,034,091 pounds, valued at $223,192. The number of vess engaged in this fishery was 37, or 5 less than in the previous year.

Flounders.—The catch of flounders in the vessel fisheries amount to 2,269,807 pounds, valued at $93,800. There was an increase the catch of flounders over the previous year of 990,086 pounds, 77.36 per cent, in quantity, and $48,864, or 108.74 per cent, in val The catch taken by boats under 5 tons net tonnage is not includ in these statistics.

VESSEL FISHERIES AT SEATTLE, WASH.

In the vessel fisheries at Seattle, Wash., there has been an increa in both the quantity and value of products landed by the fishi fleet, but a decrease in the products landed by collecting vessels compared with the previous year. Statistics of the vessel fisher at Seattle have been collected by the local agent and published monthly and annual statistical bulletins, giving the quantity a value of fishery products landed by American fishing and collecti vessels at that port.

In 1918 the fishing fleet at Seattle landed 834 trips, aggregati 17,091,695 pounds of fish, having a value to the fishermen $1,887,653. This catch was taken from the fishing grounds alo the coast from the Oregon and Washington coasts to Portlock Ban Alaska. The largest quantities were taken from Grays Harb Grounds, Flattery Banks, west coast of Vancouver Island, Heca Strait, and Portlock Bank. The products included halibu 10,244,200 pounds, valued at $1,528,846; cod, 85,300 pound valued at $2,202; sablefish, 4,354,950 pounds, valued at $271,16 "lingcod," 1,784,600 pounds, valued at $62,292; rockfishes, 620,7 pounds, valued at $22,899; and sturgeon, 1,875 pounds, valued $247. Compared with the previous year, there was an increase 214 trips by fishing vessels, and of 437,751 pounds, or 2.64 per cen in the quantity, and $148,851, or 8.56 per cent, in the value of t products landed. The catch of salmon by these vessels was not large as in the previous year, but there was a large increase in t catch of sablefish, "lingcod", and rockfishes.

The fishery products taken in Puget Sound and landed at Seatt by collecting vessels during the year amounted to 10,605,323 pound valued at $912,598. These products included salmon, 8,929,7 pounds, valued at $811,028; steelhead trout, 433,756 pounds, valu at $57,724; herring, 580,200 pounds, valued at $11,853; smelt, 121,8 pounds, valued at $7,019; sole, 138,935 pounds, valued at $5,30 crabs, 139,821 pounds, valued at $10,368; and other species amoun ing to 261,016 pounds, valued at $9,299. In the products landed collecting vessels there was a decrease from the previous year 2,216,030 pounds, or 17.28 per cent, in quantity, and $75,961, or 7. per cent, in value. The quantity and value of fishing produc landed at Seattle by fishing and collecting vessels in 1918 are giv in detail in the following table:

QUANTITIES AND VALUES OF CERTAIN FRESH FISHERY PRODUCTS LANDED AT SEATTLE, WASH., BY AMERICAN FISHING VESSELS DURING THE CALENDAR YEAR 1918.

BY FISHING GROUNDS.

	Number of trips.	Halibut.		Cod.		Sablefish.		"Lingcod."		Rockfishes.		Sturgeon.		Total.	
		Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Oregon and Washington coasts	24	519,500	$76,138	.....	.....	231,000	$14,685	135,500	$4,450	21,000	$965	.....	.....	907,000	$96,238
Columbia River grounds	11	218,500	34,394	.....	.....	266,000	17,365	43,000	1,925	8,000	610	.....	.....	535,500	54,294
Grays Harbor grounds	31	298,400	44,789	.....	.....	713,000	47,811	42,000	1,295	17,000	525	.....	.....	1,070,400	94,420
Flattery Banks	480	3,038,950	460,646	.....	.....	1,903,200	114,872	1,184,000	40,613	286,000	10,432	475	$72	6,412,625	626,635
West coast Vancouver Island	133	1,223,150	190,400	.....	.....	710,400	42,383	318,100	11,699	135,900	5,257	800	80	2,388,350	249,819
Queen Charlotte Islands grounds	3	97,000	19,560	.....	.....	14,000	840	6,000	240	.....	.....	.....	.....	117,000	20,640
Hecate Strait	113	2,573,800	372,388	.....	.....	416,800	27,167	53,500	1,985	142,000	4,690	600	95	3,186,700	406,325
Forrester Island grounds	2	32,000	5,860	.....	.....	4,000	240	.....	.....	.....	.....	.....	.....	36,000	6,100
Coronation Island	2	85,000	12,378	.....	.....	15,000	1,110	.....	.....	.....	.....	.....	.....	100,000	13,488
Yakutat grounds	15	820,300	125,811	51,000	$1,380	51,150	2,989	.....	.....	9,100	367	.....	.....	931,550	130,547
Cape Cleare grounds	3	213,000	33,240	.....	.....	14,200	917	.....	.....	.....	.....	.....	.....	227,200	34,157
Portlock Bank	17	1,124,600	153,242	34,300	822	16,200	788	2,500	85	1,770	53	.....	.....	1,179,370	154,990
Total	834	10,244,200	1,528,846	85,300	2,202	4,354,950	271,167	1,784,600	62,292	620,770	22,899	1,875	247	17,091,695	1,887,653

BY MONTHS.

January	9	233,200	$43,549	5,100	$204	53,350	$2,514	5,000	$200	5,000	$200	.....	.....	301,650	$46,667
February	18	327,000	60,925	.....	.....	53,500	3,048	40,200	1,608	8,100	327	.....	.....	428,800	65,908
March	41	417,300	62,093	15,000	300	85,600	5,445	76,300	3,981	52,500	2,762	.....	.....	646,700	74,581
April	113	959,300	139,789	25,200	498	139,800	9,340	417,500	15,095	107,870	4,939	1,075	$167	1,650,745	169,828
May	131	1,553,300	220,424	.....	.....	359,200	23,421	651,000	19,635	105,800	3,191	800	80	2,670,100	266,751
June	110	1,339,000	198,794	.....	.....	542,200	38,021	195,600	6,813	83,500	2,628	.....	.....	2,160,300	246,256
July	90	1,429,550	198,140	.....	.....	733,000	49,592	92,000	3,170	71,500	2,435	.....	.....	2,326,050	253,337
August	103	1,352,650	181,949	.....	.....	974,800	62,565	63,500	1,725	44,000	1,280	.....	.....	2,434,950	247,519
September	103	1,565,800	230,708	36,000	1,080	875,600	48,645	104,000	3,725	67,500	2,047	.....	.....	2,648,900	286,205
October	70	710,700	120,610	4,000	120	417,000	21,640	46,000	1,510	33,000	970	.....	.....	1,210,700	144,850
November	33	240,900	48,700	.....	.....	98,800	5,310	44,000	1,570	21,000	650	.....	.....	404,700	56,230
December	13	115,500	23,165	.....	.....	22,100	1,626	49,500	3,260	21,000	1,470	.....	.....	208,100	29,521
Total	834	10,244,200	1,528,846	85,300	2,202	4,354,950	271,167	1,784,600	62,292	620,770	22,899	1,875	247	17,091,695	1,887,653

FISHERY PRODUCTS, BY MONTHS, TAKEN IN PUGET SOUND AND LANDED AT SEATTLE, WASH., BY COLLECTING VESSELS DURING THE YEAR 1918.

Species.	January.		February.		March.		April.		May.		June.		July.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Skates														
Sturgeon									1,700	$85	830	$27	370	$14
Herring					324,200	$4,863			46,000	690				
Salmon:														
Humpback or pink													1,200	72
Chum or keta	10,000	$1,100											4,280	340
King or spring	5,000	700					10,490	$1,560	500,600	62,000	413,500	53,755	1,983,200	198,320
Coho or silver											34,800	3,480	10,328	1,032
Sockeye or red									2,200	275	9,220	1,198	12,880	1,288
Miscellaneous							25,750	3,962	55,410	6,926	25,800	2,580	5,100	510
Trout: Steelhead	8,000	1,200	16,100	$2,445	3,000	450	14,376	2,300	215,000	26,775	7,430	817	14,640	1,464
Smelt			2,300	115							790	94		
Perch			700	35					10,600	530				
Rockfishes			1,000	70			3,240	260			1,720	41	1,200	84
"Lingcod"	2,000	120					600	30			6,830	273		
Sablefish											3,700	142		
Cod	2,000	60	40,000	1,400										
Flounders			4,000	120	4,300	86	3,500	85	13,550	405	7,840	196	3,600	108
Sole	5,000	200	13,855	554	15,500	620	9,500	380	24,050	960	4,000	140	880	34
Other fish	20,000	400												
Octopus													560	11
Crabs	16,368	981	7,238	403	13,530	2,029	9,680	804	14,080	970	2,684	183		
Total	68,368	4,761	85,193	5,142	360,530	8,048	77,136	9,381	883,190	99,616	519,144	62,926	2,038,218	203,277

Species.	August.		September.		October.		November.		[illegible]		[illegible]	
	Pounds.	*Value*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Skates	7,970	$159	21,500	$645	8,270	$168	5,000	$150	.....	.....	42,740	$1,122
Sturgeon	1,080	108	870	87	1,680	201	460	34	.....	.....	6,990	556
Herring	.....	.....	.....	.....	.....	.....	.....	.....	210,000	$6,300	580,200	11,853
Salmon:												
Humpback or pink	11,210	660	.....	.....	.....	.....	.....	.....	.....	.....	12,410	732
Chum or keta	66,900	2,155	336,000	10,080	1,768,960	88,448	331,820	33,180	360,000	43,200	2,877,960	178,503
King or spring	614,220	61,420	644,800	64,480	52,837	5,280	20,460	2,046	.....	.....	4,245,107	449,561
Coho or silver	160,680	16,068	588,950	58,950	800,930	80,009	35,800	3,580	.....	.....	1,631,488	163,119
Sockeye or red	6,220	622	8,000	30	.....	.....	.....	.....	.....	.....	38,520	3,413
Miscellaneous	2,200	222	.....	.....	.....	.....	.....	.....	10,000	1,500	124,260	15,700
Trout: Steelhead	1,860	186	2,080	20	7,810	781	2,660	266	140,800	21,020	433,756	57,724
Smelt	14,230	852	34,080	1,704	14,180	850	26,070	1,280	30,200	2,124	121,850	7,019
Perch	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,300	565
Rockfishes	9,816	352	4,800	240	6,300	431	1,600	112	6,800	476	36,476	2,066
"Lingcod"	.....	.....	.....	.....	9,280	278	.....	.....	.....	.....	18,710	701
Sablefish	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,700	142
Cod	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42,000	1,460
Flounders	9,680	288	10,600	318	7,870	236	2,600	104	11,000	330	78,540	2,276
Sole	9,800	294	18,000	630	19,000	720	5,120	205	14,250	570	138,935	5,307
Other fish	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,000	400
Octopus	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	560	11
Crabs	.....	.....	.....	.....	20,691	1,312	.....	.....	55,550	3,686	[a] 139,821	10,368
Total	915,868	83,386	1,669,680	137,184	2,717,808	178,714	431,590	40,957	838,600	79,206	10,605,323	912,598

[a] 6,294 dozen.

FISHERIES OF THE GREAT LAKES, LAKE OF THE WOODS, AND RA LAKE IN 1917.

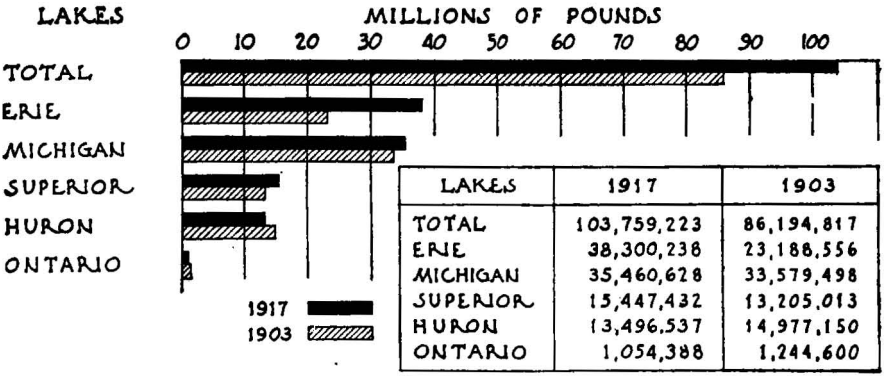
A statistical canvass of the fisheries of the Great Lakes, includ Lake of the Woods, Rainy Lake, and Lakes Kabetogama and La Cr was made during the year for the calendar year 1917.

The number of persons engaged in the fisheries of these water 1917 was 9,416; the investment was $10,732,879; and the produ amounted to 105,926,392 pounds, valued at $6,416,477.

In the fisheries of the Great Lakes the number of persons enga was 9,221; the investment in vessels, boats, fishing apparatus, sh and accessory property, and cash capital was $10,555,669; and products amounted to 103,759,223 pounds; valued at $6,297,9 The principal species taken, including fresh, salted, and smoked f were carp, 7,163,347 pounds, valued at $334,888; ciscoes, 53,429, pounds, valued at $2,609,917; blue pike, 2,102,803 pounds, valued $140,025; wall-eyed pike, 2,496,691 pounds, valued at $298,271; s ger, 3,929,172 pounds, valued at $240,035; sheepshead or dr 2,901,994 pounds, valued at $70,936; suckers, 5,361,138 pou valued at $204,825; lake trout, 13,344,139 pounds, valued at $1,2 704; whitefish, 6,190,748 pounds, valued at $723,167; and yel perch, 4,206,011 pounds, valued at $245,223. The ciscoes incl lake herring, chub, longjaw, bluefin or blackfin, and tullibee.

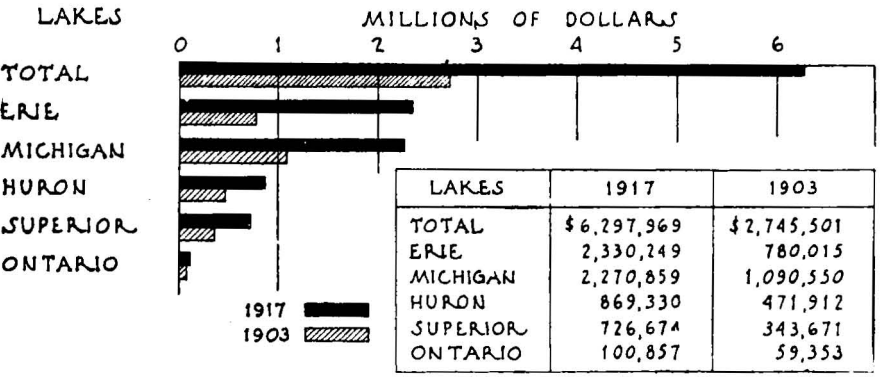
Compared with the returns for 1908, published by the Bureau of Census, there was an increase of 8.06 per cent in the number persons engaged, and of 119.27 per cent in the amount of cap invested, but there was a decrease of 2.69 per cent in the quant with an increase of 67.14 per cent in the value of the products. Th was a large increase in the catch of burbot, cisco or lake herri sheepshead or drum, and lake trout, but a decrease in carp, pi pike perch, whitefish, and a number of other species. Compa with the statistics for 1903, published by the Bureau, there wa decrease of 1.20 per cent in the number of persons engaged, but increase of 41.22 per cent in the amount of capital invested, and 20.37 per cent in the quantity, and 129.39 per cent in the value the products. There was considerable increase in nearly all of more important species except pike perch, lake trout, and yel perch. The increase in burbot, and possibly some of the ot species, is, no doubt, due to the work of the Bureau in encourag the more extensive use as food of species heretofore little used that purpose.

In the fisheries of Lake of the Woods and Rainy Lake the num of persons engaged was 195; the investment was $177,210; and products amounted to 2,167,169 pounds, valued at $118,508. T principal species taken were ciscoes, pike, wall-eyed pike, sucke and whitefish.



LAKES	1917	1903
TOTAL	103,759,223	86,194,817
ERIE	38,300,238	23,188,556
MICHIGAN	35,460,628	33,579,498
SUPERIOR	15,447,432	13,205,013
HURON	13,496,537	14,977,150
ONTARIO	1,054,388	1,244,600

FIG. 3.—Quantities of fish taken in the commercial fisheries of the Great Lakes in 1917 and 1903.



LAKES	1917	1903
TOTAL	$6,297,969	$2,745,501
ERIE	2,330,249	780,015
MICHIGAN	2,270,859	1,090,550
HURON	869,330	471,912
SUPERIOR	726,674	343,671
ONTARIO	100,857	59,353

FIG. 4.—Values of fish taken in the commercial fisheries of the Great Lakes in 1917 and 1903.

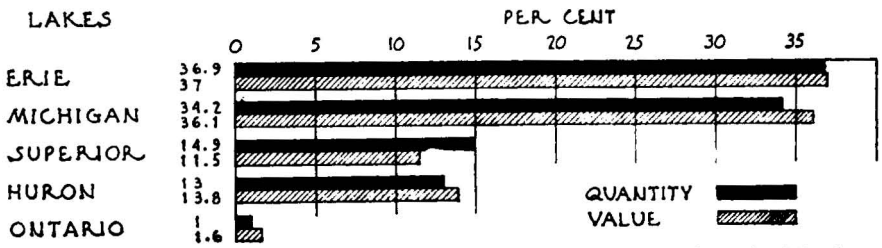
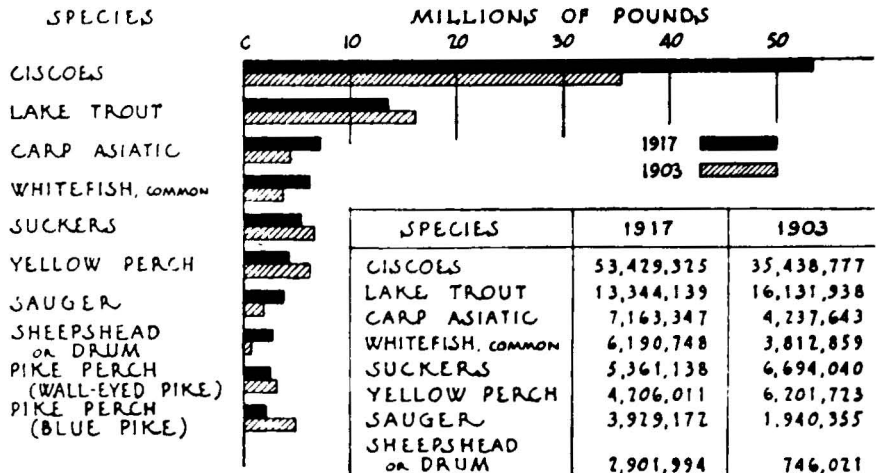
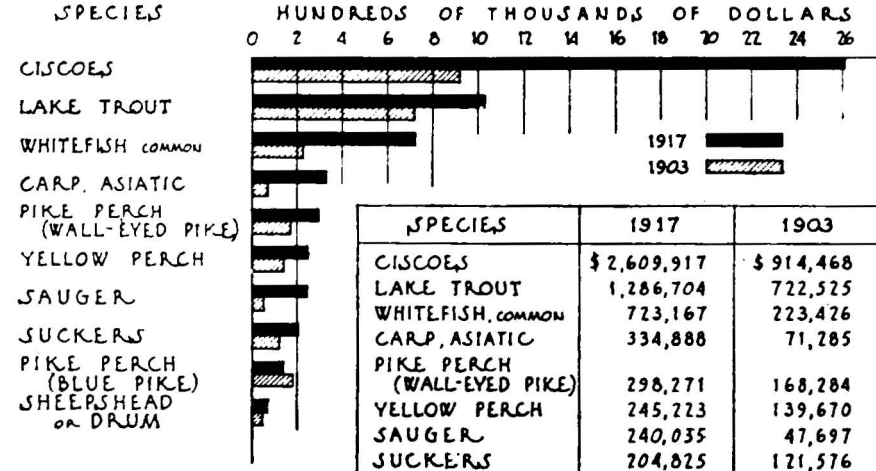


FIG. 5.—Percentages of total quantity and value of fishery products reported for each of the Great Lakes, 1917.



SPECIES	1917	1903
CISCOES	53,429,325	35,438,777
LAKE TROUT	13,344,139	16,131,938
CARP ASIATIC	7,163,347	4,237,643
WHITEFISH, COMMON	6,190,748	3,812,859
SUCKERS	5,361,138	6,694,040
YELLOW PERCH	4,706,011	6,201,723
SAUGER	3,929,172	1,940,355
SHEEPSHEAD OR DRUM	2,901,994	746,021
PIKE PERCH (WALL-EYED PIKE)	2,496,691	3,076,147
PIKE PERCH (BLUE PIKE)	2,102,803	4,981,422

FIG. 6.—Quantities of the more important species of fish taken in the commercial fisheries of the Great Lakes in 1917 and 1903.



SPECIES	1917	1903
CISCOES	$2,609,917	$914,468
LAKE TROUT	1,286,704	722,525
WHITEFISH, COMMON	723,167	223,426
CARP, ASIATIC	334,888	71,285
PIKE PERCH (WALL-EYED PIKE)	298,271	168,284
YELLOW PERCH	245,223	139,670
SAUGER	240,035	47,697
SUCKERS	204,825	121,576
PIKE PERCH (BLUE PIKE)	140,025	191,386
SHEEPSHEAD OR DRUM	70,936	5,700

FIG. 7.—Values of the more important species of fish taken in the commercial fisheries of the Great Lakes in 1917 and 1903.

Items.	Lake Superior.		Lake Michigan.		Lake Huron.[a]		Lake Erie.[b]		Lake Ontario.[c]		Lake of the Woods and Rainy Lake.[d]		Total.	
	Number.	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
Persons engaged	1,348		3,313		1,412		2,770		378		195		9,416	
INVESTMENT.														
Vessels fishing, steam	12	$52,800	92	$397,650	13	$57,500	73	$469,398					190	$977,348
Tonnage	302		1,795		266		1,700						4,063	
Outfit		11,080		122,885		22,450		93,679						250,094
Vessels fishing, gasoline	4	20,500	240	234,310	13	19,000	20	39,000	1	$1,200			278	314,010
Tonnage	104		2,113		113		183		8				2,521	
Outfit		5,550		56,636		5,540		7,986		20				75,732
Vessels transporting, steam	4	56,000			2	7,000	5	24,500			2	$9,800	13	97,300
Tonnage	194				24		111				29		358	
Outfit		17,880				500		5,200				6,160		29,740
Vessels transporting, gasoline	7	19,500	60	38,225	19	33,500	19	41,600	1	1,300			106	134,125
Tonnage	68		495		169		193		10				935	
Outfit		3,915		4,515		4,750		9,455		65				22,700
Sail and rowboats	417	10,220	428	9,943	370	9,660	602	27,370	189	4,765	3	800	2,009	62,758
Power boats	280	82,405	311	91,595	264	104,860	414	178,815	79	17,130	79	27,300	1,427	502,105
Pound nets and trap nets	204	26,262	1,134	242,570	1,731	207,904	5,011	681,060	353	21,460	185	36,250	8,618	1,215,506
Gill nets	11,117	144,986	83,807	645,074	10,610	102,835	47,578	329,632	165	15,175	220	8,150	153,497	1,245,852
Fyke nets			2,828	39,795	460	12,135	801	44,403	334	4,374	30	400	4,453	101,107
Seines	5	325	61	18,120	83	9,325	285	38,867	12	610			446	67,247
Lines		5,773		27,868		5,989		741		1,174				41,545
Crawfish pots			6,400	1,600									6,400	1,600
Fishing machines									7	795			7	795
Other apparatus						1,520		10		6				1,536
Shore and accessory property		341,310		1,758,341		444,092		1,884,165		50,235		81,850		4,559,993
Cash capital		42,500		349,800		156,100		456,886		20,000		6,500		1,031,786
Total		841,006		4,038,927		1,204,660		4,332,767		138,309		177,210		10,732,879

[a] Includes Lake St. Clair and St. Clair River.
[b] Includes men and investment in the wholesale fish trade of Detroit.
[c] Includes St. Lawrence and Niagara Rivers.
[d] Includes Lakes Kabetogama and La Croix.

STATISTICS OF FISHERIES OF THE GREAT LAKES, LAKE OF THE WOODS, AND RAINY LAKE IN 1917—Continued.

Items.	Lake Superior.		Lake Michigan.		Lake Huron.		Lake Erie.		Lake Ontario.		Lake of the Woods and Rainy Lake.		Total.	
PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Bowfin	2,675	$170			200	$4	5,145	$69	7,046	$340			15,066	$583
Buffalofish			1,200	$56									1,200	56
Burbot			106,785	1,436	2,174	51	652,870	8,027	61,700	2,188	67,740	$564	951,329	12,466
Carp, Asiatic			246,503	7,500	1,260,580	48,136	5,644,792	277,089	41,472	2,173			7,163,347	334,898
Catfish and bullheads			164,406	6,627	33,159	3,295	618,512	39,232	47,944	5,935	9,890	570	873,911	55,659
Ciscoes, fresh	8,904,855	319,858	15,341,588	706,638	3,277,573	120,705	17,160,852	1,046,862	460,363	39,991	372,548	12,770	45,627,779	2,246,824
Ciscoes, salted	3,158,227	139,959	2,917,760	139,344	2,100,792	94,957			8,909	1,051			8,185,694	373,311
Ciscoes, smoked	5,400	432			3,000	120							8,400	552
Eel									43,007	3,402			43,007	3,402
Gold-eye											50,365	813	50,365	813
Muskellunge					145	15							145	15
Pike	5,700	555	40,507	3,373	12,354	1,175	5,066	540	16,191	2,149	553,727	22,109	633,545	29,913
Pike perch (blue pike)							2,057,073	135,241	45,730	4,784			2,102,803	140,025
Pike perch (wall-eyed or yellow pike)	27,979	3,774	132,024	18,445	1,042,642	126,431	1,291,456	149,163	2,590	458	706,279	67,615	3,202,970	365,886
Rock bass			1,714	137	4,283	208	100	5	7,525	463			13,622	813
Sauger							3,929,172	240,035					3,929,172	240,035
Sheepshead or drum			28,412	796	17,731	615	2,855,551	69,502	300	23			2,901,994	70,936
Sturgeon			10,805	2,517	4,896	1,063	28,384	6,064	51,141	12,067	13,810	1,649	109,036	23,360
Sturgeon caviar			346	904	227	485	1,018	2,065	544	1,232			2,135	4,678
Suckers, fresh	326,203	13,184	2,103,163	74,903	1,775,767	72,883	1,035,934	36,403	89,111	6,317	268,980	3,584	5,599,158	207,174
Suckers, salted	15,850	560	14,110	625	1,000	50							30,960	1,235
Sunfish					1,650	68			23,885	1,327			25,535	1,395
Trout, lake, fresh	2,581,081	215,397	8,647,985	852,849	2,070,707	213,790	1,922	201	23,694	2,848	2,630	209	13,328,019	1,285,294
Trout, lake, salted	7,272	576	2,820	269	8,658	774							18,750	1,619
Trout, steelhead			21,960	3,349									21,960	3,349
White bass			1,275	77			266,112	17,212					267,387	17,289
Whitefish, common, fresh	302,210	30,943	3,045,448	323,162	983,501	124,050	1,755,947	232,761	88,347	11,730	96,185	8,085	6,271,638	730,731
Whitefish, common, salted			1,945	201	3,350	330							5,295	531
Whitefish, common, caviar					1,375	257							1,375	257
Whitefish, Menominee, fresh	12,080	662	100,332	4,850	46,457	2,191							158,869	7,703
Whitefish, Menominee, salted	2,900	228	26,103	1,973	20,017	1,200							49,020	3,401
Yellow perch, fresh	5,000	356	2,361,071	116,419	844,019	56,464	959,357	69,684	34,839	2,219	5,835	510	4,210,121	245,652
Yellow perch, salted			1,725	81									1,725	81
Other fish					30	3	10,335	104			100	10	10,465	117
Crawfish			80,495	4,427									80,495	4,427
Total	15,447,432	728,674	35,460,628	2,270,859	13,406,517	809,330	38,300,238	2,330,349	1,054,388	100,857	2,167,169	118,308	105,936,392	6,416,477

NOTE.—Ciscoes include lake herring, chub, longjaw, bluefin or blackfin, and tullibee.

Years.	Lake Superior.		Lake Michigan.		Lake Huron.		Lake Erie.		Lake Ontario.		Lake St. Clair and St. Clair and Detroit Rivers.[b]		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
1885	8,825,980	$291,523	23,518,148	$878,788	11,457,170	$276,397	51,456,517	$1,109,096	2,398,466	$95,869	2,185,795	$40,193	99,842,076	$2,691,866
1890	6,115,992	220,968	26,434,266	830,465	10,056,381	221,067	64,850,873	1,000,905	3,446,448	124,786	2,994,571	73,577	113,898,531	2,471,768
1893	8,096,927	252,107	30,747,755	828,611	12,064,338	306,381	42,968,325	805,979	928,015	31,510	1,814,311	46,030	96,619,671	2,270,618
1899	5,429,654	150,862	34,499,996	876,743	12,418,327	308,078	58,393,864	1,150,895	2,406,332	100,997	579,067	23,864	113,727,240	2,611,439
1903	13,205,013	343,671	33,579,498	1,090,550	14,455,209	450,318	23,188,556	780,015	1,244,600	59,353	521,941	21,594	86,194,817	2,745,501
1908	10,198,000	342,000	40,019,000	1,554,000	12,932,000	486,000	41,922,000	1,280,000	823,000	74,000	737,000	32,000	106,631,000	3,768,000
1917	15,447,432	726,674	35,460,628	2,270,859	13,363,207	857,478	38,300,238	2,330,249	1,054,388	100,857	133,330	11,852	103,759,223	6,297,969

[a] The statistics for 1908 in this table are from data published by the Bureau of the Census.
[b] The decline in the fisheries of Lake St. Clair and St. Clair and Detroit Rivers is due largely to legal restrictions.

FISHERY PRODUCTS RECEIVED AT THE MUNICIPAL FISH WHARF A MARKET, WASHINGTON. D. C.

Large quantities of fishery products are received at the Munic Fish Wharf and Market, Washington, D. C., from the Chesape region and other sections of the Atlantic coast. The salmon part of the halibut handled are from the Pacific coast. The prod are disposed of to the retail markets of the city, and are also to s extent sold at retail at the municipal market. Through the court of the health department of the District of Columbia the Bureau been furnished with daily reports of the quantity of fishery prod received at this market since the latter part of March last y These statistics have been compiled for the period from April December, 1918, and are given in detail, by months, in the follow table:

FISHERY PRODUCTS RECEIVED AT THE MUNICIPAL FISH WHARF AND MARKET, W INGTON, D. C., FROM APRIL TO DECEMBER, 1918.

Species	April	May.	June	July.	Aug
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pou*
Bass, black and sea		11,800	25,040	3,317	
Bluefish		426			
Butterfish	523	32,360	69,525	77,609	5
Carp	15,957	11,956	5,192	3,450	
Catfish	20,877	16,545	16,158	3,339	
Cod	2,025	750	1,000	8,825	2
Croaker	398,660	248,340	197,746	83,641	4
Drum, red	100		361	98	
Eel	2,427	2,102	694	573	
Flounders	5,177	8,109	5,442	11,199	1
Gizzard shad	670	400			
Haddock			400	23,625	3
Hake				450	
Halibut	2,725	1,500	2,155	2,555	
Herring:					
River, fresh	418,596	93,867	821		
River, salted	5,000	169,000	27,250	2,500	
Hickory shad or jacks	1,340				
Hogfish		2,100	200		
Kingfish	100	200		100	
Mackerel		2,625	9,760	10,700	
Menhaden	1,130			200	
Mullet	115	20		13	
Perch	32,459	12,089	7,349	13,023	
Pike or pickerel	55	20			
Pollock	300		400	9,150	
Porgy or scup		400	6,000	2,550	
Salmon			210	675	
Shad	307,538	153,090	708		
Spot		150	1,126	11,455	1
Striped bass	38,822	14,717	5,360	12,166	1
Sturgeon	586	1,376	455	90	
Tilefish	2,525	2,500	735		
Trouts, sea	5,131	434,268	227,000	122,237	29
Whiting				14,050	
Clams, hard	7,712	14,624	14,720	13,824	1
Oysters:					
In the shell	49,861	9,240	3,486	2,002	
Opened	28,364	3,061			
Squid		1,200			
Crabs	585	12,915	40,680	63,930	4
Crab meat	1,430	5,540	7,515	7,715	
Turtles		1,685	225		
Total	1,338,790	1,268,975	677,713	505,061	59

SHERY PRODUCTS RECEIVED AT THE MUNICIPAL FISH WHARF AND MARKET, WASHINGTON, D. C., FROM APRIL TO DECEMBER, 1918—Continued.

Species.	September.	October.	November.	December.	Total.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
ss, black and sea	524	13,782	30,334	25,597	111,602
uefish	9,912	18,182	1,050	.....	29,670
tterfish	15,333	17,709	22,200	800	294,635
rp	5,821	10,264	6,078	10,100	71,564
fish	12,328	22,209	20,582	12,745	130,878
co	.....	.....	225	600	825
d	23,320	16,225	16,075	5,640	94,480
aker	23,707	19,010	17,460	679	1,017,481
um, red	240	.....	.....	.....	799
l	689	1,633	1,947	1,116	11,304
unders	14,267	16,446	9,310	10,372	92,562
zzard shad	1,043	5,423	9,576	9,119	26,231
ddock	69,100	72,950	41,750	21,205	263,100
ke	2,775	8,600	27,900	4,200	46,175
libut	4,375	11,813	48,935	850	79,158
rring:					
River, fresh	3,650	.....	.....	300	519,484
River, salted	.....	.....	.....	.....	203,750
Sea	.....	26,850	206,800	2,600	236,250
ckory shad or jacks	.....	.....	.....	.....	1,340
gfish	200	600	920	.....	4,220
ngfish	100	.....	110	375	985
ckerel	14,090	13,600	25,850	60,550	140,025
nhaden	.....	300	.....	.....	1,630
llet	502	5,676	5,718	2,360	14,404
rch	5,544	9,607	12,398	11,820	106,119
ke or pickerel	720	1,552	1,911	1,197	5,480
llock	20,375	20,900	25,440	19,700	105,965
rgy or scup	1,400	400	.....	.....	11,575
mon	225	4,450	12,375	.....	17,935
ad	.....	.....	.....	2,972	464,308
epshead	100	252	.....	.....	352
elt	.....	.....	75	590	665
ot	15,276	24,230	6,200	.....	70,737
ped bass	12,883	38,731	24,128	.....	159,690
rgeon	130	685	45	30	3,477
efish	.....	1,275	2,550	2,747	12,332
outs, sea	302,120	267,975	49,395	34,230	1,737,627
hitefish	.....	.....	225	.....	225
hiting	4,800	19,000	104,870	71,488	216,208
ams, hard	11,584	6,464	6,528	6,304	[a] 95,328
sters:					
In the shell	39,347	140,497	218,386	220,129	[b] 684,418
Opened	35,788	92,400	134,821	125,895	[c] 420,816
allops	.....	.....	.....	200	200
uid	.....	.....	.....	.....	1,200
abs	28,020	5,250	75	.....	201,120
ab meat	5,415	7,445	4,925	3,725	51,030
rimp	1,050	1,500	1,050	950	4,550
rrapin	.....	.....	240	.....	240
rtles	205	.....	315	155	2,845
Total	686,958	923,885	1,098,772	671,340	7,766,994

[a] 11,916 bushels. [b] 97,774 bushels. [c] 51,008 gallons.

FISHERIES OF THE PACIFIC COAST STATES IN 1915.

The data contained in this report apply to the year 1915, and were llected in 1916 and 1917 and prepared by Winthrop A. Roberts nd Rob Leon Greer, agents of this Bureau. A statistical bulletin ntaining the information in condensed form was issued in Octoer, 1917.

The number of persons employed in the fisheries of the Pacific oast States in 1915 was 28,997, of whom 4,229 were on vessels shing, 475 on vessels transporting fishery products, 14,235 in shore sheries, and 10,058 in canneries and other fishery industries. Wash-

ington had 14,649 persons employed in its fisheries; Oregon, 5,9(
and California 8,452.

The amount of capital invested in the fisheries of these Stat
was $24,017,967. In Washington the investment was $14,129,5
in Oregon, $4,064,151; and in California, $5,824,263. The inve
ment included 1,039 fishing and transporting vessels and scows o
net tons and upward, valued at $3,559,777 and having a net tonna
of 24,703 tons, and outfits valued at $721,156; 9,402 boats, valued
$2,850,211; fishing apparatus used by vessels and boats to the val
of $3,147,785; shore and accessory property valued at $12,201,9(
and cash capital amounting to $1,537,136. The forms of fishi
apparatus having the greatest value were gill nets, 9,863, valued
$1,309,805, and pound nets, 483, valued at $1,122,803. These we
all used in the shore or boat fisheries except 158 gill nets, valued
$4,705, employed in the vessel fisheries. The pound nets were
in Washington except 39, valued at $22,700, in Oregon.

The products of the fisheries amounted to 287,085,344 pound
having a value to the fishermen of $9,306,448. The output in Was
ington was 159,053,778 pounds, valued at $5,320,725; in Orego
34,692,863 pounds, valued at $1,479,021; and in California, 93,338,7
pounds, valued at $2,506,702. The catch of salmon, including ste
head trout, amounted to 131,932,020 pounds, valued at $4,091,68
albacore, 21,049,190 pounds, valued at $316,103; cod, 10,487,4
pounds, valued at $343,338; and halibut, 40,825,874 pounds, valu
at $2,050,709. A considerable number of other species were al
taken in large quantities.

Compared with the returns for 1904, there was an increase of 47.
per cent in the number of persons employed, 87.05 per cent in t
amount of capital invested, and 70.27 per cent in the quantity a
39.30 per cent in the value of the products. Compared with t
returns for 1908, published by the Bureau of the Census, there was
increase of 81.70 per cent in the number of persons employed, 58.
per cent in the amount of capital invested, and 62.97 per cent in t
quantity and 36.07 per cent in the value of the products.

The following tables contain statistics of the number of perso
employed, the amount of capital invested, the quantity and value
the products of the fisheries of the Pacific Coast States in 1915, a
comparative statistics of those items for various years; also, statisti
of various fishery products prepared and the pack of canned salm
in Washington, Oregon, and California in 1915, comparative statisti
of the number of cases of salmon canned in certain years, the yie
of the fisheries of the principal rivers in 1915, and comparative st
tistics of the catch of introduced fishes:

...ons Engaged, Investment, and Products of the Fisheries of the Pacific Coast States in 1915.

	Washington.		Oregon.		California.		Total.	
...SONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
...ssels fishing	3,655		23		551		4,229	
...essels transporting	390		60		35		475	
...ore fisheries	5,481		4,472		4,282		14,235	
...shore, in canneries, ...	5,129		1,345		3,584		10,058	
Total	14,645		5,900		8,452		28,997	
INVESTMENT.								
...els fishing	472	$2,194,660	5	$22,650	73	$354,375	550	$2,571,685
...Tonnage	11,363		74		3,198		14,635	
...Outfit		578,825		3,285		52,791		634,901
...els transporting	140	689,248	30	84,184	20	72,000	190	845,432
...Tonnage	2,213		267		330		2,810	
...Outfit		68,895		11,850		5,510		86,255
...vs (5 tons and over):	299	142,660					299	142,660
...Tonnage	7,258						7,258	
...s, gasoline	1,567	645,480	1,382	582,485	1,429	1,351,110	4,378	2,579,075
...s, sail, row, etc	2,591	96,515	1,264	69,805	1,169	104,816	5,024	271,136
...aratus, vessel fish-...								
...es:								
Seines	374	256,875			7	8,550	[a] 381	265,425
Gill nets	5	450			153	4,255	[b] 158	4,705
Beam trawls	16	1,440					16	1,440
Trammel nets					125	3,075	[c] 125	3,075
Lampara nets					1	400	1	400
Paranzella nets					8	2,900	8	2,900
Hoop nets	85	270					85	270
Pots	220	325			120	280	340	605
Whaling apparatus		2,050						2,050
Lines		46,800		1,005		1,562		49,367
Dredges	10	275					10	275
...aratus, shore fish-...								
...es:								
Seines	200	23,145	75	35,125	147	19,485	[d] 422	77,755
Gill nets	2,878	308,859	3,877	582,740	3,950	413,591	[e] 9,705	1,305,190
Pound nets	444	1,100,103	39	22,700			483	1,122,803
Lampara nets					64	29,100	64	29,100
Trammel nets					2,195	56,325	[f] 2,195	56,325
Paranzella nets					36	6,100	36	6,100
Beam trawls	7	405			9	400	16	805
Fyke nets					2,485	21,640	2,485	21,640
Bag nets					70	2,000	70	2,000
Hoop nets	2,402	7,227	680	995	4,860	13,585	7,942	21,807
Dip nets	67	134			11	64	78	198
Roof nets	8	425					8	425
Pots and traps	4,725	8,152	5,768	4,828	4,187	9,157	14,680	22,137
Wheels	2	1,000	27	107,800			29	108,800
Lines		21,200		1,438		10,845		33,483
Dredges, tongs, hoes, rakes, etc		4,536		539		1,170		6,245
Abalone outfit						2,460		2,460
...e and accessory ...operty		7,386,599		2,083,913		2,731,390		12,201,902
...l capital		543,000		448,809		545,327		1,537,136
Total		14,129,553		4,064,151		5,824,263		24,017,967
PRODUCTS.								
...core (or tuna):	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Fresh					21,024,190	$315,622	21,024,190	$315,622
Salted					25,000	481	25,000	481
...hovies:								
Fresh					81,385	1,730	81,385	1,730
Salted					16,000	1,600	16,000	1,600
...acuda:								
Fresh					3,262,646	111,690	3,262,646	111,690
Salted					330,000	13,180	330,000	13,180
...ito					448,256	12,622	448,256	12,622
...	200,000	$4,000	50,000	$750	350,815	6,366	600,815	11,116
...ish					517,054	24,299	517,054	24,299
:								
Fresh	22,025	421	14,400	288			36,425	709
Salted	5,498,284	180,934			4,952,692	161,695	10,450,976	342,629
...ker					3,150	65	3,150	65

[a] 201,640 yards. [b] 11,840 yards. [c] 10,000 yards. [d] 77,635 yards. [e] 2,465,920 yards. [f] 126,600 yards.

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF THE PAC
COAST STATES IN 1915—Continued.

	Washington.		Oregon.		California.		Total.	
PRODUCTS—continued.								
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Va*
Flounders:								
Fresh	25,855	$736	1,965	$40	6,914,063	$209,291	6,941,883	$21
Salted					9,500	475	9,500	
Grayfish	7,093,996	15,959					7,093,996	1
Hake:								
Fresh					221,252	1,937	221,252	
Salted					24,000	960	24,000	
Halibut	40,590,705	2,041,279	235,169	9,430			40,825,874	2,05
Hardhead					73,423	3,622	73,423	
Herring:								
Fresh	2,129,149	9,655	12,500	383	764,384	7,116	2,906,033	1
Salted					50,000	1,000	50,000	
Jewfish:								
Fresh					116,461	1,859	116,461	
Salted					138,000	5,020	138,000	
Kingfish					656,003	17,362	656,003	1
"Lingcod":								
Fresh	837,110	2,812	12,870	354	570,860	14,687	1,420,840	1
Salted					3,500	175	3,500	
Mackerel:								
Fresh					253,899	6,668	253,899	
Salted					6,450	259	6,450	
Mullet					3,000	300	3,000	
Perch	14,750	493	11,930	360	216,785	6,327	243,465	
Pike, Sacramento					15,884	449	15,884	
Pompano					19,350	2,032	19,350	
Rock bass:								
Fresh					895,284	24,110	895,284	2
Salted					2,750	97	2,750	
Rockfishes:								
Fresh	101,351	2,995	12,000	445	4,336,254	145,816	4,449,605	14
Salted					8,000	400	8,000	
Sablefish	575,810	13,782	15,520	388	64,503	1,359	655,833	1
Salmon:								
Blueback	5,043,374	345,710	337,027	16,848			5,380,401	36
Chinook—								
Fresh	18,188,160	699,771	23,482,292	1,209,024	7,283,933	338,549	48,954,385	2,24
Salted					20,000	2,400	20,000	
Chum	17,156,224	282,842	1,981,879	11,081	38,093	190	19,176,196	29
Humpback	29,998,291	367,521					29,998,291	36
Silver	18,630,302	543,241	4,844,844	94,137	415,197	12,459	23,890,343	64
Sardines:								
Fresh					4,387,706	27,651	4,387,706	2
Salted					1,400	80	1,400	
Sculpin					8,813	345	8,813	
Sea bass			2,000	60	1,221,262	49,381	1,223,262	4
Sea trout					6,083	213	6,083	
Shad:								
Fresh	96,298	1,164	488,625	4,945	6,846,008	66,982	7,430,931	7
Salted					10,000	125	10,000	
Roe					27,033	2,491	27,033	
Sharks	399,000	889			67,972	236	466,972	
Skates	229,000	515			177,650	868	406,650	
Smelts	2,158,371	25,333	3,500	175	1,137,072	52,978	3,298,943	7
Sole	68,062	1,951			5,761,929	108,254	5,829,991	11
Spanish mackerel					396,905	11,555	396,905	1
Split-tail					17,016	384	17,016	
Steelhead trout	2,114,141	91,389	2,365,858	75,231	32,405	1,288	4,512,404	16
Sting ray					605,000	1,512	605,000	
Striped bass					1,784,448	146,928	1,784,448	14
Sturgeon	43,656	2,151	97,785	5,014	16,924	987	158,365	8
Sturgeon caviar	300	75					300	
Sturgeon roe					1,275	708	1,275	
Surf fish					127,500	7,255	127,500	
Tomcod			22,500	900	41,912	939	64,412	
Whitebait					56,250	2,250	56,250	
Yellowtail:								
Fresh					1,094,416	26,123	1,094,416	2
Salted					124,500	4,743	124,500	
Miscellaneous fishes					17,232	539	17,232	
Abalone:								
Alive					24,026	517	24,026	
Meat					730,974	16,830	730,974	1
Shells					74,000	1,890	74,000	
Pearls and blisters						1,240		
Clams:								
Hard	175,744	12,191			65,856	17,583	241,600	2
Soft	1,200	150	22,460	3,041	67,160	18,107	90,820	2
Razor	372,750	56,446	77,200	10,900			449,950	6

RSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF THE PACIFIC COAST STATES IN 1915—Continued.

	Washington.		Oregon.		California.		Total.	
DUCTS—continued.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
sels	700	$83	.....	.....	19,240	$2,326	19,940	$2,409
ters:								
Eastern market	265,013	140,028	.....	.....	375,774	165,573	640,787	305,601
Native—								
Market	450,394	250,298	1,547	$725	8,435	6,513	460,376	257,536
Seed	24,808	8,619	.....	.....	.....	.....	24,808	8,619
opus	.....	.....	.....	.....	32,309	2,717	32,309	2,717
id	15,000	325	.....	.....	6,211,325	32,626	6,226,325	32,951
os	1,734,410	54,526	415,272	13,755	1,414,155	128,434	3,563,837	196,715
wfish	.....	.....	183,720	20,747	550	265	184,270	21,012
imp	386,420	18,719	.....	.....	298,000	5,550	684,420	24,269
ıy lobsters	.....	.....	.....	.....	892,392	130,119	892,392	130,119
tles	.....	.....	.....	.....	206	13	206	13
tongues	30,000	2,090	.....	.....	7,400	370	37,400	2,460
ale oil	2,635,125	112,851	.....	.....	.....	.....	2,635,125	112,851
alebone	6,000	4,200	.....	.....	.....	.....	6,000	4,200
er whale products	1,292,000	24,390	.....	.....	.....	.....	1,292,000	24,390
lion	.....	.....	.....	.....	9,375	4,120	9,375	4,120
p	450,000	191	.....	.....	5,000,000	2,500	5,450,000	2,691
er seaweeds	.....	.....	.....	.....	6,799	325	6,799	325
Total	159,053,778	5,320,725	34,692,863	1,479,021	93,338,703	2,506,702	287,085,344	9,306,448

MMARY OF PERSONS ENGAGED, CAPITAL INVESTED, AND VALUE OF PRODUCTS OF THE FISHERIES OF THE PACIFIC COAST STATES IN CERTAIN YEARS.

Items and States.	1888	1892	1895	1899	1904	1908	1915
ERSONS ENGAGED.							
shington	3,363	4,310	6,212	9,911	8,829	4,954	14,645
gon	3,619	4,332	6,323	5,643	5,299	4,772	5,900
fornia	4,684	5,403	4,770	3,974	5,530	4,129	8,452
Total	11,666	14,045	17,305	19,528	19,658	13,855	28,997
CAPITAL INVESTED.							
shington	$1,261,078	$1,593,567	$2,024,469	$6,601,243	$5,319,201	$3,442,000	$14,129,553
gon	1,859,299	2,272,351	2,637,412	3,497,643	3,756,692	1,367,000	4,064,151
fornia	2,081,950	2,526,746	2,612,298	2,774,493	3,764,056	1,659,000	5,824,263
Total	5,202,327	6,392,664	7,274,179	12,873,379	12,839,949	6,468,000	24,017,967
ALUE OF PRODUCTS.							
shington	810,326	931,568	1,402,433	2,871,438	2,972,633	3,513,000	5,320,725
gon	733,867	872,405	1,284,136	855,750	1,185,092	1,356,000	1,479,021
fornia	2,465,317	3,022,991	1,786,479	2,551,451	2,523,141	1,970,000	2,506,702
Total	4,009,510	4,826,964	4,473,048	6,278,639	6,680,866	6,839,000	9,306,448

QUANTITY AND VALUE OF VARIOUS FISHERY PRODUCTS PREPARED, EXCLUSIVE CANNING, IN THE PACIFIC COAST STATES IN 1915.

Method and products.	Washington.		Oregon.		California.		Total.	
DRIED.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Squid					1,200,000	$51,000	1,200,000	$51,
FROZEN.								
Barracuda	150	$12					150	
Dolly Varden trout	6,577	345					6,577	
Finnan Haddie	390	50					390	
Flounder	280	15					280	
Halibut	2,551,537	122,052	5,000	$450			2,556,537	122
Herring	1,887,645	28,705					1,887,645	28
Horse mackerel	250	15					250	
"Lingcod"	20,235	809					20,235	
Mackerel	870	45					870	
Perch	315	20	500	40			815	
Rockfishes	31,218	1,440					31,218	1
Sablefish	281,450	8,423	1,000	80			282,450	8
Salmon:								
Chinook	650,805	45,074	95,000	2,700			745,805	47
Chum	1,680,718	69,568					1,680,718	69
Silver	1,237,158	64,822	75,023	3,384			1,312,181	68
Sardines	975	12					975	
Shad			36,160	1,825			36,160	1
Shad roe	150	25	5,123	696			5,273	
Smelt	105,446	4,673					105,446	4
Sole	1,100	44					1,100	
Spanish mackerel	3,015	200					3,015	
Steelhead trout	282,025	19,900	377,482	20,785			659,507	40
Sturgeon			49,560	6,426			49,560	6
Tomcod			500	40			500	
Shrimp	24,274	2,425					24,274	2
Squid	1,035	55					1,035	
Lobster	617	125					617	
Miscellaneous	43,892	3,000					43,892	3
Total	8,812,127	371,854	645,348	36,426			9,457,475	408
MILD-CURED.								
Salmon:								
Chinook	1,208,800	130,052	2,821,027	384,090	1,761,300	187,220	5,791,127	677
Chum	83,000	2,060	4,000	240			87,000	2
Silver			40,800	4,095			40,800	4
Shad			8,000	440	105,000	5,250	113,000	5
Steelhead trout			800	80			800	
Total	1,291,800	132,112	2,874,627	388,945	1,866,300	192,470	6,032,727	713
PICKLED.								
Salmon: Chinook					245,000	26,950	245,000	26
SALTED.								
Albacore (or tuna)					71,020	3,092	71,020	3
Barracuda					8,000	240	8,000	
Bonito					8,210	328	8,210	
Halibut	57,100	3,426					57,100	3
Herring	47,000	630			100,000	4,500	147,000	5
Jewfish					44,998	1,350	44,998	1
"Lingcod"	1,000	20					1,000	
Mackerel					1,896	75	1,896	
Rock bass					1,000	40	1,000	
Rockfishes					3,500	122	3,500	
Sablefish	212,300	9,728					212,300	9
Salmon:								
Chinook					160,000	6,500	160,000	6
Chum	1,600	800	5,000	225			6,600	1
Humpback	10,000	400					10,000	
Silver	1,444,800	91,489	4,200	377			1,449,000	91
Sardines					20,000	2,000	20,000	2
Seabass					3,000	120	3,000	
Shad					4,558,750	63,212	4,558,750	63
Spanish mackerel					6,450	258	6,450	
Yellowtail					37,158	1,301	37,158	1
Total	1,773,800	106,493	9,200	602	5,023,982	83,138	6,806,982	190

UANTITY AND VALUE OF VARIOUS FISHERY PRODUCTS PREPARED, EXCLUSIVE OF CANNING, IN THE PACIFIC COAST STATES IN 1915—Continued.

thod and products.	Washington.		Oregon.		California.		Total.	
SMOKED.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
bacore (or tuna)	.....	.....	.....	.....	7,600	$858	7,600	$858
d	50,000	$5,000	.....	.....	.....	.....	50,000	5,000
libut	97,050	9,335	.....	.....	10,000	1,500	107,050	10,835
rring	37,800	1,175	.....	.....	5,000	300	42,800	1,775
blefish	279,850	26,163	.....	.....	2,000	45	281,850	26,208
lmon:								
Chinook	1,525,520	147,793	1,075	$134	10,000	1,500	1,536,595	149,427
Chum	65,500	3,288	.....	.....	.....	.....	65,500	3,288
Silver	2,200	218	500	50	.....	.....	2,700	268
rgeon	230	29	.....	.....	.....	.....	230	29
Total	2,058,210	193,301	1,575	184	34,600	4,203	2,094,385	197,688
MISCELLANEOUS.[a]								
rimp meat	133,689	38,303	.....	.....	.....	.....	133,689	38,303
rtilizer	3,851,000	77,500	400,000	7,600	850,000	15,305	5,104,000	100,465
ultry food	421,000	10,370	.....	.....	1,140,000	28,200	1,564,000	38,570
ue	400,121	36,200	.....	.....	.....	.....	[b]400,121	36,200
l	1,281,338	50,555	225,000	9,000	491,752	19,548	[c]2,001,090	79,103
ound clamshells	300,000	1,500	.....	.....	.....	.....	300,000	1,500
Total	6,396,148	214,488	625,000	16,600	2,481,752	63,053	9,502,900	294,141
Grand total	20,332,085	1,018,248	4,155,750	442,757	10,851,634	420,814	35,339,469	1,881,819

[a] The fertilizer, poultry food, glue, and oil shown in the above table were prepared from fish and h offal.
[b] 41,038 gallons.
[c] 266,812 gallons.

SALMON PACK OF THE PACIFIC COAST STATES IN 1915.

Items.	Washington.		Oregon.		California.		Total.	
	Number.	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
nneries[a]	59	$5,187,297	28	$1,088,358	5	$289,361	[a] 92	$6,565,016
sh capital	.....	386,300	.....	339,809	.....	55,000	.....	781,109
rsons engaged	4,097	.....	943	.....	590	.....	5,630	.....
ages paid	.....	1,199,867	.....	369,799	.....	91,235	.....	1,660,901
PRODUCTS.[b]								
lueback or sock-eye cases	91,720	932,394	4,510	24,915	.....	.....	96,230	957,309
hinook do	178,464	1,400,220	292,765	2,246,565	19,508	109,391	490,737	3,756,176
um do	450,409	1,219,061	40,728	104,698	.....	.....	491,137	1,323,759
umpback do	590,378	1,772,565	.....	.....	.....	.....	590,378	1,772,565
lver do	206,508	1,036,859	53,405	258,038	3,578	16,391	263,491	1,311,288
eelhead trout cases	10,270	64,860	18,783	112,600	.....	.....	29,053	177,460
Total	1,527,749	6,425,959	410,191	2,746,816	23,086	125,782	1,961,026	9,298,557

[a] 26 of these firms were also engaged in other branches of the canning or packing trade, with 6 of whom lmon canning was merely incidental.
[b] All products represent 48 pounds to the case.

COMPARATIVE SUMMARY, BY STATES, OF THE NUMBER OF CASES OF SALMON CANNED IN THE PACIFIC COAST STATES IN CERTAIN YEARS.

State	Blueback.	Chinook.	Chum.	Humpback.	Silver.	Steelhead trout.	Total.
1892—Washington	19,441	134,253	29,411	.....	28,708	26,945	238,7
Oregon	51,106	237,684	.....	.....	60,293	45,403	394,4
California	.....	14,334	.....	.....	1,550	.....	15,8
Total	70,547	386,271	29,411	.....	90,551	72,348	649,1
1905—Washington	55,237	129,078	23,480	17,530	31,707	25,663	282,6
Oregon	23,074	176,024	9,230	.....	62,913	39,563	310,8
California	.....	26,436	.....	.....	500	.....	26,9
Total	78,311	331,538	32,710	17,530	95,120	65,226	620,4
1904—Washington	51,717	156,549	33,972	9,049	32,118	23,209	308,5
Oregon	25,523	216,507	3,162	.....	100,087	38,829	384,1
California	.....	31,663	.....	.....	500	.....	32,1
Total	79,240	404,719	37,114	9,049	132,705	62,038	724,8
1905—Washington	70,894	157,187	48,686	24,633	81,957	18,985	400,7
Oregon	12,854	316,294	27,027	.....	138,981	30,603	525,8
California	.....	28,635	.....	.....	400	.....	29,0
Total	83,158	502,106	75,713	24,633	221,338	49,678	955,6
1906—Washington	505,950	95,147	42,656	252,733	145,139	2,258	1,041,8
Oregon	19,665	214,821	18,345	.....	78,730	9,736	341,2
California	.....	34,180	.....	.....	.....	.....	34,1
Total	525,615	344,148	61,001	252,733	223,869	11,994	1,417,3
1908—Washington	112,911	140,695	94,265	.....	168,069	3,050	518,9
Oregon	9,264	223,646	15,150	.....	65,557	6,818	320,4
California	.....	17,807	.....	.....	.....	.....	17,8
Total	122,175	382,148	109,415	.....	233,626	9,868	857,2
1909—Washington	.....	.....	.....	.....	.....	.....	460,2
Oregon	.....	.....	.....	.....	.....	.....	340,3
California	.....	.....	.....	.....	.....	.....	3,9
Total	.....	.....	.....	.....	.....	.....	804,5
1910—Washington	91,720	178,464	420,409	500,378	209,508	10,270	1,527,7
Oregon	4,510	292,765	40,728	.....	53,405	18,783	410,1
California	.....	19,408	.....	.....	3,578	.....	23,0
Total	96,230	490,637	461,137	500,378	263,491	29,053	1,961,0

YIELD OF THE FISHERIES OF THE PRINCIPAL RIVERS OF THE PACIFIC COAST STATES IN 1915.

Species	Chetco River, Oreg.		Columbia River, Wash. and Oreg.		Coquille River, Oreg.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Carp			250,000	$4,750		
Salmon:						
Blueback			522,274	25,287		
Chinook	30,500	$1,833	29,620,791	1,454,873	207,138	$5,4
Chum			2,274,082	13,958		
Humpback			147,924	1,845		
Silver	12,270	306	4,372,439	92,170	330,046	5,0
Steelhead	300	10	3,795,452	122,135	12,630	3
Shad, fresh			580,985	5,947		
Smelts			1,636,605	6,748		
Sturgeon			123,273	6,793		
Sturgeon caviar			200	75		
Tomcod			22,500	900		
Crawfish			193,720	20,747		
Total	43,130	2,149	* 43,529,345	1,756,228	549,804	10,9

* This does not include 66,000 pounds of chinook salmon valued at $3,300; 38,000 pounds of chum salmon valued at $1,520; and 12,330 pounds of silver salmon, valued at $370, taken in the Columbia River by California fishermen.

ELD OF THE FISHERIES OF THE PRINCIPAL RIVERS OF THE PACIFIC COAST STATES IN 1915—Continued.

Species.	Eel River, Calif.		Klamath River, Calif.		Necanicum River, Oreg.		Nehalem River, Oreg.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
non:								
Chinook	447,306	$17,886	643,000	$14,467	.....	.....	371,024	$9,212
Chum	.....	.....	.....	.....	3,220	$45	176,330	883
Silver	71,972	2,846	174,846	3,497	42,058	850	322,632	6,453
Steelhead	31,605	1,264	.....	.....	.....	.....	23,644	945
rgeon	8,010	250	.....	.....	.....	.....	.....	.....
Total	558,893	22,246	817,846	17,964	45,278	895	893,630	17,493

Species.	Nestucca River, Oreg.		Rogue River, Oreg.		Sacramento River, Calif.		San Joaquin River, Calif.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
.....	.....	.....	.....	.....	95,529	$1,412	63,286	$1,474
ish	.....	.....	.....	.....	188,267	7,961	328,787	16,388
dhead	.....	.....	.....	.....	68,749	3,476	4,674	146
e, Sacramento	.....	.....	.....	.....	10,924	320	4,960	129
non:								
Chinook	161,901	$4,047	1,081,457	$65,001	3,382,370	185,231	200,409	10,390
Silver	174,268	3,485	51,874	1,297	.....	.....	.....	.....
Steelhead	16,890	675	.....	.....	.....	.....	.....	.....
d:								
Fresh	.....	.....	.....	.....	4,681,710	50,756	561,820	7,172
Salted	.....	.....	.....	.....	10,000	125	.....	.....
Roe	.....	.....	.....	.....	9,135	872	17,898	1,619
t-tail	.....	.....	.....	.....	15,550	329	1,466	55
ped bass	.....	.....	.....	.....	1,271,102	104,432	69,646	5,898
rgeon	.....	.....	.....	.....	8,855	732	59	5
rgeon roe	.....	.....	.....	.....	1,253	697	22	11
kers	.....	.....	.....	.....	689	16	1,375	70
tles	.....	.....	.....	.....	.....	.....	22	4
Total	353,059	8,207	1,133,331	66,298	9,744,133	356,359	1,254,424	43,361

Species.	Siletz River, Oreg.		Siuslaw River, Oreg.		Smith River, Calif.		Snake River, Wash.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
non:								
Blueback	.....	.....	.....	.....	.....	.....	4,600	$355
Chinook	167,064	$8,197	33,180	$829	61,420	$1,535	48,088	3,757
Chum	36,720	185	.....	.....	.....	.....	984	79
Silver	106,670	1,612	83,306	1,670	15,552	233	5,448	398
Steelhead	.....	.....	1,040	31	.....	.....	85,848	6,781
rgeon	.....	.....	.....	.....	.....	.....	1,300	98
Total	310,454	9,994	117,526	2,530	76,972	1,768	146,260	11,468

YIELD OF THE FISHERIES OF THE PRINCIPAL RIVERS OF THE PACIFIC COAST STA IN 1915—Continued.

Species.	Snohomish River, Wash.		Umpqua River, Oreg.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Carp					408,815	$7
Catfish					517,054	24
Hardhead					73,423	3
Pike, Sacramento					15,884	
Salmon:						
Blueback	2,250	$180			529,124	25
Chinook	44,690	1,564	112,923	$2,265	36,613,321	1,786
Chum	42,800	803	5,130	40	2,539,266	15
Humpback	13,900	208			161,824	2
Silver	304,000	11,695	548,610	10,000	6,615,991	141
Steelhead	15,750	945	3,000	120	3,986,149	133
Shad:						
Fresh					5,824,515	63
Salted					10,000	
Roe					27,033	2
Smelts					1,625,605	6
Split-tail					17,016	
Striped bass					1,340,748	110
Sturgeon					150,207	7
Sturgeon caviar					300	
Sturgeon roe					1,275	
Suckers					2,064	
Tomcod					22,500	
Crawfish					183,720	20
Turtles					22	
Total	423,390	15,395	669,663	12,425	60,665,946	2,355

COMPARATIVE STATEMENT OF THE CATCH OF INTRODUCED FISHES IN THE PAC COAST STATES IN 1899, 1904, 1908, AND 1915.[a]

WASHINGTON.

Species.	1899		1904		1908		1915	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Va*
Carp							200,000	$4
Catfish	105,700	$2,114	6,000	$300				
Shad	85,000	1,275	125,287	1,753	100,000	$1,900	96,298	1
Total	190,700	3,389	131,287	2,053	100,000	1,900	296,298	5

OREGON.

Carp			20,000	$200	30,000	$300	50,000	
Catfish	54,360	$1,087	180,000	6,000	201,000	9,000		
Shad	32,000	320	36,846	1,433	431,000	8,000	488,625	4
Total	86,360	1,407	236,846	7,633	662,000	17,300	538,625	5

CALIFORNIA.

Carp	283,514	$2,400	70,374	$1,407	427,000	$4,300	350,815	$6
Catfish	465,911	12,734	737,144	20,992	1,069,000	56,000	517,054	24
Shad	1,137,801	14,303	327,372	9,960	1,169,000	12,000	6,858,008	67
Striped bass	1,234,230	61,814	1,570,404	92,116	1,776,000	135,000	1,784,448	146
Total	3,121,546	91,251	2,705,294	124,475	4,441,000	207,300	9,510,325	244

TOTAL.

Carp	283,514	$2,400	90,374	$1,607	457,000	$4,600	600,815	$11
Catfish	625,971	15,935	923,144	27,292	1,270,000	65,000	517,054	24
Shad	1,254,801	15,898	489,505	13,146	1,700,000	21,900	7,442,931	73
Striped bass	1,234,320	61,814	1,570,404	92,116	1,776,000	135,000	1,784,448	146
Total	3,398,606	96,047	3,073,427	134,161	5,203,000	226,500	10,345,248	255

[a] The statistics for 1908 in this table are from data published by the Bureau of the Census.

FISHERIES OF WASHINGTON.

The fisheries of Washington in 1915 were more extensive than ose of Oregon and California combined. The number of persons nployed was 14,645, of whom 3,655 were on vessels fishing, 380 on ssels transporting fishery products, 5,481 in the shore or boat sheries, and 5,129 on shore in canneries and other fishery industries. The investment amounted to $14,129,553, which includes 472 shing vessels valued at $2,194,660, with a net tonnage of 11,363 ns, and outfits valued at $578,825; 140 transporting vessels, alued at $689,248, with a net tonnage of 2,213 tons, and outfits alued at $68,895; 299 scows, valued at $142,660, with a net tonage of 7,258 tons; 1,567 gasoline boats, valued at $645,480; 2,581 il and other boats, valued at $96,515; fishing apparatus employed n vessels to the value of $308,485; fishing apparatus employed on oats to the value of $1,475,186; shore and accessory property alued at $7,386,599; and cash capital amounting to $543,000.

The products amounted to 159,053,778 pounds, valued at 5,320,725, credited to the different districts as follows: Puget ound, 84,204,558 pounds, valued at $2,095,547; Columbia River nd tributaries, 15,796,175 pounds, valued at $496,339; Grays Iarbor, 5,159,682 pounds, valued at $154,505; Willapa Harbor, ,800,074 pounds, valued at $178,557; and the Pacific Ocean and ther waters, 51,209,557 pounds, valued at $2,405,155. The catch of almon, including steelhead, amounted to 91,130,492 pounds, valued t $2,330,474; halibut, 40,590,705 pounds, valued at $2,041,279; cod, ,520,309 pounds, valued at $181,355; grayfish, 7,093,996 pounds, alued at $15,959; smelts, 2,158,371 pounds, valued at $25,333; rabs, 1,734,410 pounds, valued at $54,526; and oysters, eastern and ative, 740,215 pounds, or 105,745 bushels, valued at $398,945. he whale products included whale oil, 2,635,125 pounds, valued at 112,851; whalebone, 6,000 pounds, valued at $4,200; and other roducts amounting to 1,292,000 pounds, valued at $24,390.

Compared with the returns for 1904, there was an increase of 65.87 er cent in the number of persons employed, 165.63 per cent in the mount of capital invested, and of 78.80 per cent in the quantity nd 78.99 per cent in the value of the products. The products also ow an increase of 58.33 per cent in the quantity and 51.45 per cent n the value over those in the returns for 1908, published by the Bureau of the Census.

For statistics as to the number of persons employed, amount of apital invested, and the quantity and value of the products of the sheries of Washington in 1915, see table, page 51. Statistics as o the approximate catch of certain fishery products of Washington y districts in 1915 are contained in the following table:

APPROXIMATE CATCH OF CERTAIN FISHERY PRODUCTS OF WASHINGTON, BY DISTRICTS, IN 1915.

Species.	Puget Sound.		Columbia River.[a]		Grays Harbor.		Willapa Harbor.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Carp			200,000	$4,000					200,000	$4,000
Flounders	25,855	$736							25,855	736
Grayfish	7,093,996	15,959							7,093,996	15,959
Herring	2,129,149	9,655							2,129,149	9,655
"Lingcod"	836,960	2,810							836,960	2,810
Perch	14,750	493							14,750	493
Rockfishes	80,351	2,472							80,351	2,472
Salmon:										
Blueback	3,605,737	279,112	189,847	8,794	1,242,530	$57,353	3,010	$271	5,041,124	345,530
Chinook	7,554,283	303,352	9,214,877	367,473	806,550	16,007	567,760	11,374	18,143,470	698,207
Chum	14,707,440	269,152	821,042	5,646	1,228,227	5,582	356,715	1,659	17,113,424	282,039
Humpback	29,816,167	365,213	147,924	1,845	18,310	230	1,960	25	29,984,391	367,313
Silver	14,753,946	455,908	1,877,121	42,320	1,209,360	23,598	485,875	9,720	18,326,302	531,546
Shad	3,938	162	92,360	1,002					96,298	1,164
Sharks	399,000	889							399,000	889
Skates	229,000	515							229,000	515
Smelts	532,766	18,585	1,625,605	6,748					2,158,371	25,333
Sole	68,062	1,951							68,062	1,951
Steelhead trout	400,529	28,071	1,590,311	50,558	98,133	5,317	8,918	498	2,098,391	90,444
Sturgeon	5,778	295	36,788	1,877	1,800	57	400	12	44,856	2,241
Sturgeon caviar			300	75					300	75
Clams:										
Hard	175,744	12,191							175,744	12,191
Soft							1,200	150	1,200	150
Razor					207,430	37,736	75,320	18,710	372,750	56,446
Mussels	700	83							700	83
Oysters:										
Eastern, market	84,910	47,549			875	525	179,228	91,954	265,013	140,028
Native—										
Market	440,685	245,543					9,709	4,755	450,394	250,298
Seed	12,607	3,390					12,201	5,229	24,808	8,619
Squid	15,000	325							15,000	325
Crabs	380,785	12,226			255,847	8,100	1,097,778	34,200	1,734,410	54,526
Shrimp	386,420	18,719							386,420	18,719
Kelp	450,000	191							450,000	191
Total	81,204,558	2,095,547	15,796,175	496,339	5,159,682	154,505	2,800,074	178,557	107,960,489	2,924,948

[a] The data for the Columbia River comprise those for all of its tributaries including the Snake River, which is also shown separately in another table.

FISHERIES BY COUNTIES.

In 1915 commercial fishing was prosecuted in 25 counties in Washington. These include counties bordering on Puget Sound, the Pacific Ocean, and the Columbia River and tributaries. This report shows salmon, including steelhead trout, taken commercially as far from the coast as in the Snake River opposite Lewiston, Idaho. No commercial fishing, however, is followed from the latter State, as its laws discourage all but hook-and-line fishing. Practically the entire catch of the Snake River is made with seines and consists mainly of steelhead trout and chinook salmon; a few blueback, chum, and silver salmon, and sturgeon are also taken.

King County.—This county supports the most valuable fisheries of the State, due mainly to the fact that Seattle is located within its boundaries. Most of the State's salmon and halibut fleets are owned and operated from this city. Among other important fisheries entered here are the gill-net and troll fisheries. In 1915 the products of the fisheries of this county amounted to 54,993,930 pounds, with a value to the fishermen of $2,204,124. The two most important items of this total are 33,642,389 pounds of halibut, valued at $1,691,211, and 16,934,501 pounds of the various species of salmon, including steelhead trout, valued at $406,981. Salted cod amounting to 2,220,000 pounds, with a value of $73,980, is also an important item. These fish are taken and salted in Alaskan waters and brought back to the State for repacking and shipment.

Whatcom County.—The output of the fisheries of this county in 1915 amounted to 20,546,494 pounds, having a value to the fishermen of $493,887, consisting mainly of salmon. Most of these are taken with pound nets and gill nets in the shore fisheries and with purse seines in the vessel fisheries. This county, being very convenient to the fishing grounds, has many of the largest salmon canneries of the State. Bellingham and Blaine are the centers of the canning, as well as of the fishing, industry of the county.

Skagit County.—The fisheries of this county ranked next in importance to those of Whatcom County, the output amounting to 14,693,537 pounds, valued at $427,988. This county is also convenient to the salmon-fishing grounds, and owes its extensive fisheries to that fact. With the exception of a few cases of salmon packed at La Conner, all of the county's salmon pack was put up at Anacortes, where eight canneries were in operation in 1915. Extensive pound-net and purse-seine fisheries are also operated from here. La Conner supports valuable gill-net fisheries, the catch being taken to Anacortes. Included in the total output of the county are 3,278,284 pounds of salted cod, valued at $106,954, taken in Alaskan waters by schooners owned at Anacortes. Samish, in this county, is the most northern point in the State at which oysters are taken. In 1915, 2,400 bushels of eastern oysters, worth $9,000, and 480 bushels of native oysters, worth $1,890, were marketed from private beds in Samish Bay.

Pierce County.—Fishing is followed from many places in this county, but the most important fishing center in the county is Tacoma, where a large number of purse-seine vessels are owned and operated. Several halibut vessels also fish from this port. No salmon canning is done in this county, but large quantities of fish are handled at

Tacoma, either in a fresh, frozen, salted, or smoked conditi
This county leads in the value of its shrimp fisheries, 201,332 poun
having a value to the fishermen of $9,171, being credited to it in 19
The meat of more than one-half of these shrimps is extracted
Tacoma dealers before selling. The total output of fishery produ
in the county was 15,861,531 pounds, valued at $408,964, as compar
with 7,255,164 pounds, valued at $196,824, in 1904.

Pacific County.—This county ranks fifth in the value of its fishe
products. The salmon fisheries are the most important, but the
are also several others deserving of mention. The total producti
in 1915 amounted to 8,701,774 pounds, with a value to the fisherm
of $398,845, showing a decline since 1904 of 427,074 pounds and
$169,350 in value. The transplanting and raising of oysters fr
eastern seed is an important industry in this county. In 19
31,821 bushels were taken up and sold by the owners for $115,1
Native oysters to the amount of 1,412 bushels, valued at $4,8
were also sold, showing a great decline in production since 19
when the last canvass by the Bureau was made. Among oth
items of interest were $34,400 worth of crabs and $18,710 worth
razor clams. The most valuable fisheries of the county are locat
at Chinook, near the mouth of the Columbia River, where pou
nets are used almost exclusively. Bay Center is the center of t
crab, and Nahcotta and vicinity of the razor clam, industry.

Grays Harbor County.—The products of this county, former
named Chehalis, in 1915 amounted to 9,793,354 pounds, valued
$317,158. The most important items of this total are whale produc
valued at $134,441. Three steamers are employed in this indust
from Bay City, Wash., where a plant is located, to which t
whales are brought for the manufacture of fertilizer and oil. Th
county differs from the four preceding counties in that the salm
fisheries hold second place instead of first. The most valuab
razor-clam industry in the State is located in this county. Practical
all of these clams are utilized in canneries located within the count
Aberdeen is the most important fishing and canning center.

Thurston County.—Olympia is the only fishing locality of a
importance in this county. In this town and vicinity is centered t
native oyster industry of the State. Out of a total for the county
747,521 pounds of products, valued at $244,209, the oyster indust
contributed 294,296 pounds, or 56,328 bushels, of native oyste
valued at $219,818, and 14,091 pounds, or 2,013 bushels, of easte
oysters, valued at $9,394. Seed oysters to the amount of 3,7
pounds, or 542 bushels, with an estimated value of $813, are al
shown. Shrimp, smelt, and clams are important items in the tot
output.

Kitsap County.—The fisheries of this county in 1915 amounted
9,905,345 pounds, with a value to the fishermen of $235,980, as co
pared with 1,052,928 pounds, valued at $38,019, in 1904. One-ha
of the value in 1915 is credited to halibut taken by vessels owned
various localities in the county. The next most important is t
salmon fishery, the output of which amounted to 4,905,529 pound
valued at $97,081. Several vessels were engaged in taking herrin
the total catch amounting to 1,335,049 pounds, valued at $6,03
These were sold mainly for halibut bait. The smelt fishery is
some importance, the catch amounting to 94,175 pounds, valued

1. Two clam canneries at Bangor utilize most of the clams on the western side of the county bordering on Hood Canal. taken on the eastern side are sold mostly in Seattle. There great many fishing localities in this county, but none of great portance. There were 65 fishing vessels in the county, which nstituted an important factor in its fisheries.

Wahkiakum County.—The total output of this county amounted to 06,288 pounds, valued at $142,308, showing a decline since 1904 5,561,387 pounds in quantity and of $234,203 in value. The catch nsisted almost entirely of salmon taken in the Columbia River. he gill-net fisheries are the most important, but the pound-net heries at Cathlamet and vicinity contribute about one-third of the tal production of the county. That town has very important gill- t fisheries also and ranks as the most important fishing center on e Columbia River. Canneries at Altoona, Brookfield, Cathlamet, d Eaglecliff utilize large quantities of salmon. A considerable antity is also smoked at Altoona. A few shad are put up at the ltoona and Eaglecliff canneries. A very small number of cases of ad roe were also canned at Altoona.

Snohomish County.—The fishery production of this county in 1915 nounted to 3,253,395 pounds, valued at $78,860, showing an increase nce 1904 of 1,566,830 pounds in quantity and of $42,554 in value. he catch consisted almost wholly of salmon. Everett is the import- t fishing center of the county, and has a large fleet of salmon purse- ine vessels. The gill-net fishery of this city is prosecuted in the nohomish River as far up as Snohomish, but one man fishes his gill ts in the Gulf of Georgia. Four canneries at Everett utilized large uantities of salmon. A considerable number of chinook salmon ere also kippered here. Many herring are frozen for use later as alibut bait.

Clallam County.—This county has the Strait of Juan de Fuca as s northern, and the Pacific Ocean as its western, boundary. Its sheries in 1915 amounted to 2,219,016 pounds, valued at $56,011, of hich 2,090,829 pounds, valued at $50,876, were salmon. Besides e latter, some halibut, rockfishes, clams, and crabs were taken. eah Bay and Port Angeles are the leading fishing centers of the unty. Trolling for salmon is extensively followed at both places, ainly in the Pacific Ocean off Neah Bay. The catch is handled by a nnery at Neah Bay and buyers representing wholesale firms at attle and Tacoma. A cannery at Mora, on the Pacific coast, ilized the salmon caught in that neighborhood. This firm went t of business in 1916. One firm at Port Williams canned both lmon and clams, most of the latter being taken in Hood Canal. few men at Dungeness follow crabbing for several months of the ar. The returns for all of the fisheries in 1915 show an increase of 1,661 pounds in quantity and $6,397 in value since 1904.

San Juan County.—This county is conveniently located near the lmon-fishing grounds of Puget Sound, but the population seems to vor farming more than fishing. A fleet of 13 vessels, however, is important factor in the fishing industry of the county. Friday arbor, with a population of 400, is the only important fishing town the county and is more important through its salmon canning than rough its fisheries. Besides the two canneries here, there are also o at Richardson, one at Shaw Island, and one at Deer Harbor. In

1915 a small plant at Port Stanley was engaged in making potash
fertilizer from kelp. The total fishery output of this county in 1
amounted to 3,025,282 pounds, valued at $40,043, as compared w
3,180,326 pounds, valued at $103,899, in 1904. This shows a decre
of 155,044 pounds, and a proportionately greater decrease of $63,
in value, which occurred mainly in bluebacks and chinooks.

Mason County.—This county ranks third in the State in the va
of its oyster fisheries, being exceeded only by Pacific and Thurs
Counties. In 1915 the total catch of oysters amounted to 7,
bushels, valued at $26,815. Of these, 5,522 bushels, valued
$22,035, were native oysters; 750 bushels, valued at $2,250, w
eastern oysters; and 1,240 bushels, with an estimated value of $2,5
were seed oysters. It is contrary to law to sell seed oysters, and t
are taken up and used solely by oyster planters on their private be
The clam industry is also of considerable importance, 8,000 bush
with a value of $4,111, being marketed in 1915. Shelton is the cen
of the county's fishery industries. The total output of Mason Cou
in 1915 amounted to 293,304 pounds, with a value to the fishermen
$36,104, showing a decline since 1904 of 1,875,420 pounds and
$34,017, accounted for mainly through the decline of the nat
oyster industry, which was affected by a freeze occurring during
1915 season. The catch of salmon was also smaller in 1915 than
1904.

Island County.—The fisheries of this county are not important
compared with those counties already mentioned, the total product
in 1915 amounting to 1,856,919 pounds, valued at $19,611, as co
pared with 5,489,089 pounds, valued at $125,486, in 1904. T
decline is mostly in the salmon fisheries. As in San Juan County,
population includes more farmers than fishermen. In 1915 there
a fleet of only three fishing vessels, notwithstanding its proximity
the prolific salmon-fishing grounds of Puget Sound. Besides salm
the important fisheries are the crab, smelt, and grayfish. The ca
of grayfish was more than one-half of the total catch of the coun
but the value was less than one-seventh. During that year th
were used entirely for fertilizer and oil. There are no canneries a
no fishing centers of importance in the county.

Jefferson County.—Out of a total output of 3,919,316 pounds, valu
at $74,197, 2,572,837 pounds, valued at $53,785, are credited to
pound-net fishery operated from Port Townsend. Two large salm
canneries are located at Port Townsend, and also a plant utiliz
large quantities of grayfish in the preparation of fertilizer, poul
food, and oil. Hard clams and eastern oysters from private be
are among the products of this county. The returns for 1915 sh
an increased production over 1904 of 2,148,100 pounds and
$43,425.

Cowlitz County.—This county depends for its fish supply upon t
Columbia River, which forms part of its western and southe
boundaries; but the Cowlitz River, one of its tributaries, passi
through the county from north to south, also furnishes considera
quantities. In 1915, 1,609,500 pounds of eulachon, or candlef
tabulated as smelt, valued at $6,500, were taken from one of the sm
tributaries of the Cowlitz River. These fish are taken in the vicin
of Kelso during January, February, and March. Such large qua
tities are secured within so short a period of time that it is diffic

dispose of them at a profitable price, the latter ranging from $5 the beginning to as low as 10 cents per box, holding 50 pounds, the height of the season. Carrollton and Kalama are the most portant fishing localities in the county, both of them supporting ofitable pound-net fisheries. Gill netting and seining are also llowed to some extent. Aside from 300,000 pounds of salmon ozen at Kalama, most of the catch was handled fresh by two firms Kalama and Kelso. The total output of the county in 1915 as 3,935,756 pounds, valued at $73,643, as compared with 1,514,562 unds, valued at $35,864, in 1904.

Clarke County.—The total yield of the fisheries of this county in 15 was 1,016,122 pounds, valued at $44,584. The salmon fisheries e the most important in the county, though $4,000 worth of carp, ken from sloughs formed by overflow water from the Columbia iver, forms an important item. These fish are shipped mainly Seattle and Portland, and some are sent as far east as Butte, ont. Vancouver is the most important fishing locality in the unty.

Lewis County.—The fisheries of this county are unimportant, nounting in 1915 to 11,571 pounds, valued at $542, consisting of lmon taken mostly in the Chehalis and Cowlitz Rivers. No fisheries ere shown for this county in 1904.

Skamania and Klickitat Counties.—These counties, situated on e upper Columbia River, represent the upper limit of fishing on at river. In fact, no commercial fishing of importance is done on e Washington side above Grand Dalles, in Klickitat County. side from a few sturgeon taken on set lines, the catch of Skamania unty consisted entirely of salmon. The catch of Klickitat County nsisted also of salmon which were taken both in gill nets and und nets, the catch in the latter predominating. The catch of e two counties in 1915 combined was 325,055 pounds, valued at 2,249, showing a loss since 1904 of 674,032 pounds and $16,591.

Franklin, Columbia, Garfield, Whitman, and Asotin Counties.—hese counties are all situated on the Snake River, and the catch edited to them represents the total output of that river. Aside om the use of a few set lines for sturgeon and gill nets for salmon, e seine is the only form of apparatus used on the river. A few uebacks are taken, but the greater part of the catch consists of inook, silver, and steelhead. The uppermost point on the river, here commercial fishing is followed, is just above Clarkston, Wash., Lewiston, Idaho. The most important catches of the river are ade at this point. The fishing is followed in February and March, d again in August, September, and October. Except for some ipped to Spokane and near-by towns, the catch is sold locally. he total output of the five counties in 1915 amounted to 146,268 unds, valued at $11,468.

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF WASHINGTON IN 1915, BY COUNTIES.

	Asotin.		Clallam.		Clarke.		Columbia.		Cowlitz.		Franklin.		Garfield.		Grays Harbor.		Island.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels fishing															68		20	
On vessels transporting			2						2						12			
In shore fisheries	38		244		92		5		177		5		9		859		129	
On shore, in canneries, etc			107						18						741			
Total	38		353		92		5		197		5		9		1,680		149	
INVESTMENT.																		
Vessels fishing															9	$161,200	3	$9,000
Tonnage															377		46	
Outfit																11,135		910
Vessels transporting			1	$4,000					2	$3,000					6	13,750		
Tonnage			10						12						53			
Outfit				625						400						1,375		
Scows (5 tons and over)			2	1,400											5	2,475		
Tonnage			42												204			
Boats:																		
Gasoline			90	32,350	55	$18,950			122	29,450	1	$400			99	34,445	42	15,050
Sail, row, etc	11	$230	128	2,020	34	2,815	2	$30	64	2,790	2	30	3	$45	193	4,510	62	925
Apparatus, vessel fisheries:																		
Seines																	3	2,400
Length in yards																	1,550	
Whaling apparatus																2,000		
Lines																750		
Apparatus, shore fisheries:																		
Seines	7	650	4	725	1	125	2	160	2	700	1	100	3	300			33	1,945
Length in yards	750		635		150		225		670		115		350				2,310	
Gill nets	5	275	45	1,260	64	22,660			236	50,380					344	24,590		
Length in yards	425		2,675		25,750				66,315						48,748			
Pound nets					6	4,200			21	7,200					26	20,300		
Hoop nets															365	1,290		
Dip nets					4	8			62	124								
Pots			135	200											525	1,050	2,270	4,540
Lines				3,425		75						30				500		980
Dredges, tongs, rakes, etc				7												846		6

Cash capital				16,500						5,600						75,700		
Total		1,955		217,492		49,898		290		132,289		660		455		727,586		36,406
PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Carp					200,000	$4,000												
Grayfish																	1,080,000	$2,429
Halibut			42,000	$1,920											413,000	$21,607		
"Lingcod"															150	2		
Perch																	500	15
Rockfishes			57,000	1,425											21,000	523	1,000	35
Salmon:																		
Blueback or sockeye	1,100	$88			9,710	484			9,880	$457			2,250	$180	1,242,530	57,353	5,800	444
Chinook	17,160	1,372	384,426	9,614	655,325	36,711	10,125	$759	1,782,875	55,586	2,490	$199	14,640	1,170	912,005	18,745	62,484	1,683
Chum			50,376	691	17,100	85			165,350	826	984	79			1,340,262	6,145	50,024	717
Humpback			61,050	1,482					240	3					19,170	240	80,428	992
Silver	1,080	86	1,594,977	39,089	33,800	877			180,020	4,179	680	54			1,316,670	25,969	283,348	7,266
Shad					19,550	197			19,200	293								
Sharks																	64,000	141
Skates																	44,000	99
Smelts					12,550	126			1,609,500	6,580							71,500	2,543
Sole																	500	20
Steelhead trout	62,128	4,971			65,537	1,971	9,600	720	161,966	5,383			10,136	811	105,350	5,714	158	10
Sturgeon					2,550	133			6,725	336	1,200	90			1,940	58		
Clams:																		
Hard			2,520	190													552	45
Razor															297,430	37,736		
Oysters: Eastern, market															875	525		
Crabs			26,667	1,600											255,847	8,100	112,625	3,172
Whale oil															2,575,125	110,051		
Other whale products															1,292,000	24,390		
Total	81,468	6,517	2,219,016	56,011	1,016,122	44,584	19,725	1,479	3,935,756	73,643	5,354	422	27,026	2,161	9,793,354	317,158	1,856,919	19,611

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF WASHINGTON IN 1915, BY COUNTIES—Continued.

	Jefferson.		King.		Kitsap.		Klickitat		Lewis.		Mason.		Pacific.		Pierce.		San Juan.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels fishing	11		1,779		130								19		23		85	
On vessels transporting	18		30		2								13		12		22	
In shore fisheries	166		490		255		7		15		92		237		208		105	
On shore, in canneries, etc	156		432		14						8		173		97		339	
Total	351		2,731		601		7		15		100		442		340		551	
INVESTMENT.																		
Vessels fishing	2	$6,500	200	$1,162,110	67	$170,500								$19,000	70	$240,400	13	$40,300
Tonnage	18		5,815		881								350		1,377		179	
Outfit		850		101,540		35,000								1,450		52,225		5,280
Vessels transporting	7	30,100	16	51,500	2	4,000							1	25,000	6	22,500	10	43,500
Tonnage	88		212		17								18		78		125	
Outfit		4,350		7,650		2,500								1,685		2,450		3,625
Scows (5 tons and over)	18	12,550	7	3,000											2	1,400	16	10,300
Tonnage	734		175												37		375	
Boats:																		
Gasoline	33	12,650	157	103,200	82	35,950	4	$1,050			28	$10,575	30	116,425	70	41,710	22	12,800
Sail, row, etc	93	2,710	180	7,275	127	1,920	3	300	1	$150	81	1,785	50	10,850	130	6,250	40	2,165
Apparatus, vessel fisheries:																		
Seines	1	900	138	92,000	68	42,250									61	41,700	13	9,900
Lengths in yards	500		77,000		32,275										32,975		6,550	
Gill nets			4	50														
Length in yards			640															
Beam trawls			7	215											5	625		
Hoop nets													25	70				
Pots			20	25											200	300		
Whaling apparatus				50														
Lines		210		37,965		2,675										4,580		
Dredges													8	200				
Apparatus, shore fisheries:																		
Seines	12	825	21	5,070	38	2,885					15	960	2	600	20	1,350	3	915
Length in yards	1,310		4,855		3,615						1,565		800		1,695		585	
Gill nets	4	120	312	27,608	33	2,905	5	100	15	295	6	305	221	44,000	97	2,970	6	875
Length in yards	295		66,440		7,820		170		435		1,050		66,720		8,540		2,500	
Beam trawls					3	50									1	125		
Pound nets	8	60,000	27	127,000	4	9,700	6	2,500					197	133,950	1	5,000	4	17,700
Hoop nets													2,037	5,987				

Reel nets																	150		225	
Pots	25	37	60	75																
Wheels															2	1,000				
Lines		920		3,689		1,242							110			3,670		2,047		400
Dredges, tongs, rakes, etc		33		3		52							400			1,702		6		5
Shore and accessory property		206,171		1,444,075		8,450		550					5,725			212,250		247,625		413,451
Cash capital		15,000		74,800		1,500							2,000			47,200		18,000		35,000
Total		353,951		3,555,980		328,479		4,590		465			21,860			623,379		741,478		596,561
PRODUCTS.																				
Cod:	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Lbs.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Fresh			15,525	$281	6,500	$140														
Salted			2,220,000	73,980																
Flounders	6,000	$120	1,255	21	16,600	575											2,000	$20		
Grayfish	1,180,000	2,649	704,662	1,587	980,000	2,209											1,529,334	3,441	820,000	$1,844
Halibut	43,000	2,660	33,642,389	1,691,211	2,401,956	120,754											4,003,200	201,257	100	10
Herring	10,700	80	441,200	2,064	1,335,049	6,035											45,000	200		
"Lingcod"	3,300	97	42,160	899	1,000	25														
Perch	5,500	140	2,150	93	1,900	94							1,600	$40			3,700	111		
Rockfishes	5,000	300	8,201	289	5,150	278							1,000	35					2,000	70
Sable fish			526,810	12,557	27,000	675											21,000	525		
Salmon:																				
Blueback, or sockeye	24,680	1,983	657,182	50,602	172,450	14,554	20,940	$1,047	75	$7					112,357	$4,837	291,575	25,154	61,105	5,498
Chinook	637,136	21,866	1,450,927	69,664	199,462	6,086	66,245	3,013	7,930	418	13,883	516	4,371,135	155,126	293,334	12,101	133,517	3,357		
Chum	278,112	3,627	4,510,124	95,472	1,742,524	29,194			385	5	22,840	153	506,582	2,511	3,536,170	56,266	121,168	1,967		
Humpback	839,494	10,493	7,166,451	78,336	2,030,192	22,813	1,104	13			782	11	2,160	27	4,406,756	52,974	1,023,308	12,860		
Silver	760,360	23,145	2,983,403	99,126	756,249	24,103	66,600	1,500	2,710	77	73,040	2,118	1,458,686	29,985	1,321,364	42,331	367,240	13,575		
Shad			3,878	160									21,626	187						
Sharks	42,000	93	180,000	404	16,000	35											70,000	157	22,000	48
Skates	26,000	60	78,000	173	12,000	27											48,000	108	18,000	41
Smelts	7,300	355	53,600	1,784	94,175	3,381					62,300	2,180	55	2	30,300	1,050	2,076	74		
Sole	1,000	30	10,562	351	56,000	1,550														
Steelhead trout	22,160	1,322	166,414	12,781	4,652	331	40,024	1,301	471	35	1,875	125	786,043	26,833	8,232	626	288	18		
Sturgeon	2,380	68	2,480	172	78	5							17,100	784						
Sturgeon caviar													300	75						
Clams:																				
Hard	17,944	1,269	864	110	35,760	2,371					64,000	4,111			5,680	425	4,480	490		
Soft													1,200	150						
Razor													75,320	18,710						
Oysters:																				
Eastern, market	5,250	3,750									5,250	2,250	222,747	115,109						
Native—																				
Market											38,654	22,035	9,884	4,830	4,200	1,725				
Seed											8,680	2,530	12,201	5,229	133	47				
Squid															15,000	325				
Crabs	2,000	90	3,243	121									1,104,378	34,400	25,161	950				

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF WASHINGTON IN 1915, BY COUNTIES—Continued.

	Jefferson.		King.		Kitsap.		Klickitat.		Lewis.		Mason.		Pacific.		Pierce.		San Juan.	
PRODUCTS—continued.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Lbs.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Lbs.*	*Value.*
Shrimp			44,150	$3,030	10,648	$745									201,332	$9,171		
Cod tongues			12,000	840														
Whale oil			60,000	2,880														
Whalebone			6,000	4,200														
Kelp																	450,000	$191
Total	3,919,316	$74,197	54,933,930	2,204,121	9,905,345	235,980	194,913	$6,874	11,571	$342	283,301	$36,104	8,701,774	$238,845	15,864,531	408,964	3,025,282	40,043

	Skagit.		Skamania.		Snohomish.		Thurston.		Wahkiakum.		Whatcom.		Whitman.		Total.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels fishing	271				137		8		7		335				3,655	
On vessels transporting	70				28		3		13		145				380	
In shore fisheries	453		27		262		162		457		621		11		5,481	
On shore, in canneries, etc	1,111				240		79		223		1,473				5,206	
Total	1,905		27		665		252		700		2,549		11		14,724	
INVESTMENT.																
Vessels fishing	20	$97,150			20	$57,000	4	$6,400	1	$1,000	51	$107,200			472	$2,194,660
Tonnage	1,435				287		29		6		845				11,363	
Outfit		20,230				11,410		1,300		450		22,575				578,825
Vessels transporting	24	213,698			5	17,500	3	5,300	7	13,700	41	239,800			140	689,248
Tonnage	547				76		21		58		858				2,213	
Outfit		16,175				3,875		1,000		1,825		23,500				68,895
Scows (5 tons and over)	87	35,775			9	8,000					151	66,560			297	142,660
Tonnage	1,644				285						3,704				7,258	
Boats:																
Gasoline	100	48,250	15	$2,775	48	20,000	23	13,100	188	57,075	80	30,275			1,567	645,480
Sail, row, etc	333	15,575	17	895	230	4,545	120	5,175	109	6,500	286	18,350	5	$75	2,631	98,015
Apparatus, vessel fisheries:																
Seines	15	12,350			20	12,685	2	120	1	900	52	41,600			374	256,875
Length in yards	8,200				10,305		145		400		27,975				197,940	
Gill nets					1	400									5	450
Length in yards					600											

Hoop nets											60	200			85	270
Pots															220	325
Whaling apparatus																2,050
Lines		400				250										46,800
Dredges	2	75													10	275
Apparatus, shore fisheries:																
Seines	11	2,100			2	150	13	1,350	2	600	5	1,350	3	285	200	23,145
Length in yards	2,140				200		1,325		800		875		370		25,340	
Gill nets	403	20,831	39	3,030	350	8,480	1	175	365	76,725	326	21,030	1	35	2,878	308,859
Length in yards	55,175		4,220		21,230		450		134,365		58,725		30		572,078	
Beam trawls							3	225							7	405
Pound nets	41	176,653							38	30,400	65	505,500			444	1,100,103
Hoop nets															2,402	7,227
Dip nets									1	2					67	134
Reef nets											2	80			8	425
Pots	630	645			80	155					850	1,225			4,725	8,152
Wheels															2	1,000
Lines		1,752		20		1,190						1,150				21,200
Dredges, tongs, rakes, etc		4				10		1,455				7				4,536
Shore and accessory property		1,403,369		35		387,117		54,985		342,804		2,097,832		150		7,386,709
Cash capital		62,000				18,200		14,500		31,000		126,000				543,000
Total		2,136,032		6,755		560,267		105,585		563,881		3,364,324		545		14,131,163

PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Carp															200,000	4,000
Cod:																
Fresh															22,025	421
Salted	3,278,284	$106,954													5,498,284	180,934
Flounders															25,855	736
Grayfish											800,000	$1,800			7,093,996	15,959
Halibut					45,000	$1,860									40,590,705	2,041,279
Herring	2,200	22			275,000	1,169					20,000	85			2,129,149	9,655
"Lingcod"	790,500	1,789													837,110	2,812
Perch															14,750	493
Rockfishes	1,000	40													101,351	2,995
Sablefish					1,000	25									575,810	13,782
Salmon:																
Blue-back, or sockeye	557,770	47,930	7,755	$386	80,670	6,453	7,780	$690	23,645	$1,181	1,752,870	126,295	1,250	$87	5,043,374	345,710
Chinook	2,036,367	82,328	95,375	4,384	209,860	6,779	330	20	2,600,571	115,293	2,226,885	92,724	3,673	257	18,188,160	699,771
Chum	1,840,300	36,329	8,750	43	500,718	9,398	840	5	233,014	1,193	2,230,604	37,136			17,156,224	282,842
Humpback	3,879,170	57,081			1,120,508	16,796	29,644	480	4,900	61	9,332,934	112,859			29,998,291	367,521
Silver	2,040,040	71,658	5,000	112	975,608	33,928	4,068	135	468,888	10,441	3,932,783	113,229	3,688	258	18,630,302	543,241
Shad	483	15	100	1					31,461	311					96,298	1,164
Sharks											5,000	11			399,000	889
Skates											3,000	7			229,000	515
Smelts	44,191	1,331			1,406	50	121,988	4,275	3,500	40	43,930	1,562			2,158,371	25,333

Persons Engaged, Investment, and Products of the Fisheries of Washington [illegible]

PRODUCTS—continued.	Skagit.		Skamania.		Snohomish.		[illegible]		[illegible]		[illegible]		[illegible]		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	[illegible]	[illegible]	*Pounds.*	*Value.*
Sole															[illegible]	$1,9[illegible]1
Steelhead trout	137,439	$8,974	10,662	$319	31,8[illegible]	$1,[illegible]			49,[illegible]	$1,[illegible]	48,[illegible]	$[illegible]	[illegible]	$2[illegible]	2,[illegible]	91,3[illegible]
Sturgeon	840	50	2,500	130					5,[illegible]	[illegible]			100	8	43,[illegible]	2,151
Sturgeon caviar															600	75
Clams:																
Hard	176	25			1,7[illegible]	242	40,000	$2,743			2,[illegible]	[illegible]			1,[illegible],744	12,191
Soft															1,[illegible]	150
Razor															672,[illegible]	36,446
Mussels							700	83							700	83
Oysters:																
Eastern, market	16,800	9,000					[illegible],001	[illegible]							285,013	140,028
Native—																
Market	3,360	1,890					394,2[illegible]	219,818							450,394	250,208
Seed							3,794	813							24,808	8,619
Squid															15,000	325
Crabs	40,617	1,318			10,000	2[illegible]					11[illegible]	4,2[illegible]			1,734,410	51,5[illegible]
Shrimp							150,000	5,[illegible]							396,420	18,719
Cod tongues	18,000	1,254													30,000	2,090
Whale oil															2,635,125	112,851
Whalebone															6,000	4,200
Other whale products															1,292,000	24,300
Kelp															450,000	191
Total	14,083,537	427,988	130,112	5,375	3,2[illegible]	78,800	71[illegible]	211,2[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	880	[illegible]	5,330,725

PRODUCTS BY APPARATUS.

The following are the different forms of apparatus used in the sheries of Washington, in the order of their importance, based on ne value of their catch. The kinds of apparatus, such as dredges, ongs, etc., used in taking oysters, clams, and mussels are so varied hat they are not given any particular ranking on the basis of catch.

Lines.—Lines are used both in the vessel and shore fisheries, but heir importance is due mainly to their use in the halibut vessel sheries. The total catch of all species by lines in 1915 amounted o 58,923,651 pounds, with a value to the fishermen of $2,446,323. f this amount, halibut contributed 40,590,705 pounds, valued at 2,041,279. The total catch by lines in 1904 amounted to only 5,897,155 pounds, valued at $458,375.

Trolling.—Trolling has in recent years become one of the important sheries of Washington. It is followed in Neah Bay, Strait of Juan e Fuca, and in the Pacific Ocean off the village of Neah Bay, and nore recently a very large number of boats have been trolling off he mouth of the Columbia River. With the exception of fishermen rom a few towns in Pacific County, however, the latter fishery was f no great importance in 1915. In 1916, while no statistics are avail- ble, it was reliably reported that as many as 1,500 boats from Wash- ngton and Oregon were engaged in trolling off the Columbia River; ome of these were sport fishermen, but the greater proportion were ngaged in commercial fishing. Some of the boats were from as far p the river as Vancouver. Many of the gill-net fishermen laid aside heir nets to troll.

In 1915 nearly 500 boats were engaged at times in trolling in the icinity of Neah Bay. As in halibut fishing, it is followed on bank ery little being done in deep water. The boats alternate between shing in Neah Bay and in the ocean, according to the run of fish. f the weather is favorable and fishing good, a boat may remain out n the ocean, but this condition is said to have been reversed in 1916. he greatest distance resorted to by trollers is off Swiftsure Light- hip, 15 miles WNW. from Tatoosh Island. More trolling was done n this than on any other ocean bank in 1915.

The season for trolling is usually from June 15 to September 15, nd often continues until the last of October or later; but the fall ales usually put an end to the fishing, as the boats are too small o weather heavy seas.

The catch consists almost entirely of chinook and silver salmon. he former species usually predominates, but in 1915 silver salmon ere much more plentiful. In 1915 probably three-fifths of the catch as sold to a nearby cannery and the remainder to buyers repre- enting wholesale dealers in Seattle and a few in Tacoma. The fish re delivered to the canneries by means of "tenders." The tenders re gasoline boats, each of which tows a large scow. The gasoline oat loads first and makes the trip to the cannery while the scow s being loaded. The scow is usually anchored in Neah Bay. The ish are sold in the round by the fishermen. When sold to a nearby annery the fish are not dressed until landed at the cannery; when old to distant canneries they are dressed on the cannery scows as hey are brought in. In 1916 a canning firm at Anacortes had a cow anchored in Neah Bay fitted up with an "iron chink" or dress-

ing machine, which eviscerates and cuts off the head, fins, and
of the fish.

When fishing on the outside in the ocean fishermen leave the vill
of Neah Bay or vicinity at about 1 a. m. and reach the fishing grou
at 4 o'clock. The best trolling is supposed to be at daylight. Fish
is usually continued until dark; if intending to remain the boa
anchored on the bank overnight, and fishing is resumed the n
morning and continued until noon of the following day, when a ret
is made to Neah Bay for the night. Another trip is made to
fishing grounds on the following morning. These return trips
Neah Bay are often necessitated by the failure of the tender to
out to the fishing grounds.

The boats used for trolling are of gasoline power, and, with
exceptions, are less than 5 net tons in size and very seldom have m
than one man aboard. A considerable number of rowboats, howev
are also used in the fishery. It is a common occurrence for a gasol
boat to have two rowboats in tow while trolling, and occasionally
many as four may be under tow. When the two rowboats are be
towed each will be off the quarter of the gas boat and about 200 f
behind it. In the case of four rowboats the second two boats are
a distance of about 600 feet behind the gasoline boat. The dista
between the boats is so arranged that the lines will not interfere w
each other. The common practice is for the owner of the rowboat
give one-third of his catch to the owner of the gas boat for be
towed. It is said that rowboat fishing is often as successful as t
from the gas boat.

Gas boats usually have three lines fishing at a time—one from e
quarter of the boat and the other attached to a pole 6 feet lo
placed upright near the center of the boat and running off from
stern. The side lines are worked from outriggers 10 feet long, p
jecting out from the side of the boat. No bait, but a spoon is alw
used. Until recent years two and sometimes three hooks were us
but now the common practice is to use only one hook.

Pound nets.—Based upon the value of the catch, pound nets ran
second in importance among the forms of fishery apparatus used
Washington in 1915. The catch for that year amounted to 37,560,
pounds, valued at $991,115, an increase of 10,102,969 pounds a
$130,818 since 1904. There were 444 pound nets, costing $1,100,1
operated in the State in 1915. It is customary among the owners
pound nets in Washington to include in the value of the pound
the estimated value of the "stand," or bottom, where the net is s
but that practice has not been followed in this report. It is no dou
true that in most cases considerable value does attach to the sta
which is proved by the fact that even though a pound net is not
be fished a license is nevertheless secured from the State simply
hold the stand, for which large sums have often been offered. Pou
nets are quite generally used throughout the Puget Sound region a
also in the Columbia River as far up as commercial fishing is follow
The nets used in the Puget Sound region are much larger and m
expensive than those used in the Columbia River and are commo
owned by corporations, while those in the latter stream are own
mostly by individuals. The name "trap" is always used for pou
nets in this region.

Pound nets used in Washington waters are similar in principle to hose used on the Atlantic coast, consisting of a leader, one and very ften two hearts, a large followed by a small one, and a tunnel lead- ng into the pot. In addition, however, what is known as a "spiller" s attached to the side of the pot. A tunnel leads from the pot into he spiller, the fish being removed from the latter, the same as from he pot, where there is no spiller. As a rule in Puget Sound wire is ommonly used for the leaders and hearts and cotton twine for the ot and spiller. Occasionally wire is also used for the pot, but never n the spiller, as it could not then be fished. Wire has come into use ithin recent years. It is fastened to the top of the stakes by the se of boards. In addition to the two hearts some pound nets have hat are termed "jiggers" attached to the inside of the first or large eart. These are in reality equivalent to another and larger heart. he netting of the pot very seldom extends to the bottom, as this ould mean an unnecessary expenditure, but instead an "apron" of etting leading up from the heart to the bottom of the pot is used to ead the fish into the pot. Some pound nets are set to fish only one ide, the location rendering the other side useless for fishing.

The pound nets in Willapa Harbor are quite small as compared ith those in Puget Sound. The leaders are usually 100 feet or less n length, and only one heart is used. A wing is used from one side f the heart to draw the fish into it. In order to use all available pace, the tunnel from the heart to the pot opens out from the side nstead of the end of the heart. The tunnel is about 3 feet wide at he large end and narrows down to 18 inches at the small end. The unnel from the pot to the spiller is still smaller; but even as small s these entrances are, it is said that seals sometimes succeed in getting nto the pot and sometimes even into the spiller. All parts of these ets are made of twine.

Pound nets, as previously stated, are fished in the Columbia River n the Washington side as far up as commercial fishing is followed; ut more are set off Chinook than from all other points on the river ombined. The total number operated in 1915 in the vicinity of that own was 118, having a value of $97,700. These nets, as the value ndicates, are much smaller than those used in Puget Sound and are et in water from 15 to 25 feet deep. The leaders range in length rom 100 to 900 feet. One heart only is used; this has an average ength of from 30 to 35 feet and a width of 40 feet. The pots range n size from 32 to 36 feet square and the spiller from 16 to 24 eet square. The entire net is made of twine, no wire, as in Puget ound, being used. In places where the current is very strong, he entrance from the heart to the pot is similar to those of nets n Willapa Harbor; that is, from the side of the heart. In this ase the pot and spiller are upstream from the heart.

The pound nets used farther up the Columbia River at Kalama re like those below, except that they have no spiller, the catch eing taken direct from the pot. The leaders vary in length from 50 to 600 feet, and the pots are usually about 24 feet square.

The pound-net season on the Columbia River is from May 1 to ugust 25, and from September 10 to March 1, but only a few con- inue fishing after the first of December. During the spring and sum- ner season, fishing is prohibited from 6 p. m. on Saturdays to 6 p. m. n Sundays. The pound-net stakes are allowed to remain down

about 90 yards in length and 25 meshes (6½ inches) in depth. Silve salmon predominate in the catch.

Drift gill netting is usually followed at night, as the water is to clear, except after a freshet, to fish during the day.

An extensive drift gill-net fishery is prosecuted from La Conne Skagit County, in the north fork of the Skagit River. A few boat from this vicinity also go as far north as the Gulf of Georgia. Mos of the fishing in these waters, as well as in the Strait of Juan de Fuca is done during the summer, and mostly for bluebacks, though hump backs are also taken at the same time. Silver salmon are taken mor in the tributary streams. In 1915 the spring and summer catc from the Skagit River was utilized by the fresh-fish markets, but th fall catch was delivered to the canneries. In 1916 practically th entire catch, with the exception of steelhead, was utilized by th canneries.

The drift gill-net fishermen at towns on Grays Harbor are divide between those fishing on the Chehalis and those fishing on the Colum bia Rivers; the former using row, and the latter gasoline, boats. Th nets used on the Chehalis River average 100 yards in length and 3 meshes of 6¾ inches in depth. Chinook, silver, and chum salmon i the order of their importance were taken. A few men use nets wit 8¼-inch mesh for the larger chinook salmon.

The distance a net is allowed to drift before being lifted is terme a "drift" or "reach." On this river it is from 500 to 1,000 feet depending upon the condition of the bottom as to snags or othe obstructions. In 1915, the catch was sold mostly to near-by canneries but conditions were somewhat changed in 1916.

Drift gill nets used on the Columbia River in Washington vary i length from 450 to 500 yards, used at Ilwaco at the mouth of th river, to 250 yards at Stevenson, the most distant point up the rive at which they are used. At Vancouver and vicinity, however, th nets average about 600 yards in length. The depth of the net varie from 25 to 30 feet. This applies only to surface drift nets; diver o bottom nets will be described later. No. 40 linen twine runnin from 7 to 14 ply is almost invariably used. With few exceptions, tw men are required to fish a net. None but gasoline boats are used The fishing is ordinarily followed at night, but when the water become roily it can be done during the day. A "drift" or "reach" varie according to the locality and conditions. A net is sometimes allowe to drift a mile before lifting. During the spring the State law pro hibits fishing from 6 p. m. Saturday until 6 p. m. Sunday. Gill net are washed about every week in a solution of bluestone and wate to remove the slime. It is a common practice to tan the nets a intervals to render them less discernible in the water. The drif gill nets just described are all surface nets. Above Altoona a ne known as a "diver," or submersible drift gill net, is used. Th diver is similar to the surface net except that the corks are smalle and the cork and lead lines lighter, so that it will just touch th bottom. The nets are also shorter and much more shallow than th surface nets. The number in use increases going up the river from Altoona, and above Kalama it is the only kind used. Those used a Kalama and above are, however, different from those below. Instead of one they have three webs, similar to a trammel net, except that the salmon are gilled and not pocketed. The three webs are suspended

n a common cork line, but there are two lead lines. The back
bing is usually from 3 to 5 feet deeper than the other two. The
front nets hang together from the cork line to the front lead line.
back, or main, net hangs from the cork line to the other lead
. The first and third nets commonly have a mesh of 8 inches
7 inches, respectively, while the middle net has a mesh of 10 or
inches. The front net is called the "apron." Several reasons are
gned for using diver gill nets. One is that they are sunk to avoid
twood or other refuse on the surface, especially during the spring
hets. Another reason is that the fish, having encountered so
ny surface gill nets and pound nets in the river below, become more
id and swim lower. Diver nets float much more slowly than sur-
nets. It is always necessary to clean the bottom of the river
ore setting diver nets.

he most profitable drift netting is followed from the first of May
il the latter part of August. Some fishing is also followed in the
, but it is not so profitable then, as the run consists mainly of
ties" or fall chinooks, which sell for a very low price and are
rcely worth handling.

et gill nets.—Set gill nets are much shorter than drift gill nets and
fished in small streams or inlets. The two extremes of length
ld probably be 6 and 100 yards, but a fair average might be about
yards. Their depth ranges from 30 to 50 meshes, the number
ying the same as in the drift net. Linen twine of the same kind
size, as for drift nets is used. It is almost a universal custom
et them in eddies, one end being tied to a stake, or some stationary
ect, and the other anchored. Sometimes they are buoyed or
hored at each end. They can not be set across a navigable stream,
they would interfere with navigation. One man is sufficient to
dle one or more set nets, a rowboat being commonly used. The
ent of the set gill-net fishery is small as compared with drift gill
ting. Silver, chinook, steelhead, and chum salmon, in the order
heir importance, are the principal species taken.

Harpoons.—Harpoons are used only in the whale fishery, which is
tered mainly in Pacific County. One coast-trading steamer
ed in Seattle also followed whaling incidentally for a short time.
harpoon gun used in the whale fishery is, in reality, a small
non placed on a raised platform on the forward part of the boat.
bomb, a sharp-pointed projectile about a foot long, is screwed
o the tip of the harpoon. The stem or handle of the harpoon is
etimes one solid piece, but more often two pieces united at the
. The advantage of the latter kind is that it is light and can be
t a greater distance. The head of the harpoon consists of four
es or barbs which are lashed together by spun yarn. The har-
n, with bomb attached, is about 5 feet long. When the harpoon
ers the whale, the spun yarn is shoved off the flukes, allowing the
er to open in the body of the whale. At the same time, as soon
he bomb enters the whale, it is exploded into many pieces. There
sually an interval of two seconds after firing before the bomb
lodes, this interval depending upon how hard the powder is
ked in the bomb. The ignition of the powder in the bomb
ows the shoving off of the spun yarn from the flukes of the har-
n, the latter operation pulling a wire connecting with a fuse cap
the bomb. In some instances, but not in this case, an igniter

nected with the front of the pot. As soon as the fish have entere the men pull the front up with these lines. The bottom of the pou is then lifted so that the fish can be removed with dip nets.

Wheels.—Wheels are of two kinds, movable and stationary. T of the latter kind were fished in the Columbia River off Pacific Count The catch was unimportant, amounting in 1915 to only 5,234 pound with a value of $211.

Dredges, tongs, rakes, hoes, etc.—The dredge is the only one of the apparatus used both in the vessel and shore fisheries. Out of total catch of 1,740,609 pounds, valued at $468,006, 1,227,315 pound valued at $433,985, were taken inshore, and the remainder in the ve sel fisheries. Compared with the catch by the same apparatus 1904, there was a decrease of 525,920 pounds and an increase $2,132. The loss of weight was mainly in native oysters.

Dredges are used exclusively in taking oysters and are similar those used in the east for this purpose. Tongs, rakes, and hoes a also used for taking oysters. Both hoes and forks are used in catchi hard clams, but shovels only are used for razor clams. The fe mussels shown were taken with the oysters.

YIELD OF THE VESSEL FISHERIES OF WASHINGTON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS.

Apparatus and species.	Grays Harbor.		Island.		Jefferson.		King.		Kitsap.		Pacific.		Pierce.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Seines:														
Herring							337,450	$1,567	1,302,951	$5,536			45,000	$200
Salmon—														
Blueback or sockeye			5,800	$444	1,140	$100	352,265	31,168	156,560	13,300			283,795	24,529
Chinook			278	9	8,000	280	81,555	2,654	87,935	2,859			104,099	3,121
Chum			43,224	703	38,936	633	3,665,604	78,357	1,700,970	27,607			3,419,920	55,526
Humpback			74,828	922	19,224	240	5,284,916	59,361	2,007,612	22,449			4,353,636	51,760
Silver			11,154	409	3,726	137	835,153	32,478	274,038	10,964			666,612	25,623
Smelt							16,998	522	8,288	295				
Steelhead trout					25	2	1,976	113	557	37			235	16
Sturgeon							200	12						
Total			135,284	2,487	71,051	1,392	10,576,117	206,232	5,538,911	83,047			8,873,297	160,775
Gill nets:														
Cod							15,000	265						
"Lingcod"							160	6						
Total							15,160	271						
Beam trawl:														
Cod							225	7						
Flounders							555	7						
Perch							50	3						
Rockfishes							201	11						
Sole							6,562	214						
Shrimp							44,450	3,050					139,432	6,386
Total							52,043	3,292					139,432	6,386
Hoop nets and pots: Crabs							1,450	54			6,600	$200	22,661	850
Lines:														
Cod, salted							2,220,000	73,980						
Halibut	413,000	$21,607			31,000	1,700	33,627,389	1,690,566	2,401,956	120,754			4,003,260	201,257
"Lingcod"							21,400	625						
Rockfishes	18,000	448					4,900	119						
Sablefish							526,810	12,557	27,000	675			21,000	525
Salmon—														
Chinook	15,000	740					23,400	925	3,000	75			2,000	50
Humpback							455	5						
Silver	7,000	140					45,500	925	6,500	175			10,000	200
Cod tongues							12,000	836						
Total	453,000	22,935			31,000	1,700	36,481,854	1,780,538	2,438,456	121,679			4,036,260	202,032

YIELD OF THE VESSEL FISHERIES OF WASHINGTON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

Apparatus and species.	Grays Harbor.		Island.		Jefferson.		King.		Kitsap.		Pacific.		Pierce.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Dredges, etc.:														
Eastern oysters, market											43,519	$23,155		
Native oysters, market											175	75		
Total											43,694	23,230		
Harpoons:														
Whalebone							6,000	$1,200						
Whale oil	2,575,125	$110,051					40,000	2,800						
Other whale products	1,292,000	24,390												
Total	3,867,125	134,441					46,000	4,000						
Grand total	4,320,125	157,378	135,284	$2,487	102,051	$3,092	47,192,624	1,997,387	7,977,367	$204,726	50,294	23,430	13,071,650	$370,043

Apparatus and species.	San Juan.		Skagit.		Snohomish.		Thurston.		Wahkiakum.		Whatcom.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Seines:														
Herring					275,000	$1,100					20,000	$85	1,980,401	$8,557
Salmon—														
Blueback or sockeye	25,425	$2,288	55,585	$4,446	70,670	5,653					258,790	23,230	1,210,030	105,158
Chinook	2,676	83	65,696	2,299	60,704	2,125			62,500	$1,560	43,968	1,548	517,401	16,538
Chum	103,912	1,688	540,000	12,125	398,904	7,479			24,000	120	1,695,648	27,199	11,631,118	211,437
Humpback	459,300	5,739	762,800	11,442	1,080,048	16,200					3,180,261	36,148	17,222,628	204,261
Silver	60,174	2,381	121,800	5,075	161,460	6,727			20,000	400	492,174	18,335	2,646,291	102,529
Shad			423	13									423	13
Smelt	1,000	35			1,400	50	47,488	$1,665					75,180	2,567
Steelhead trout	50	2	13,787	824	75	4			2,500	80	475	32	19,680	1,110
Sturgeon													200	12
Total	652,537	12,216	1,560,081	36,224	2,048,267	39,407	47,488	1,665	109,000	2,160	5,691,319	106,577	35,303,352	652,182
Gill nets:														
Cod													15,000	265
"Lingcod"													160	6
Salmon—														
Blueback					750	60							750	60
Chinook					250	10							250	10
Chum					400	7							400	7

Humpback					1,200	18							2,000	80
Silver					2,000	80								
Total					4,600	175							19,760	446
Beam trawl:														
Cod													225	7
Flounders													555	7
Perch													50	3
Rockfishes													201	11
Sole													6,562	214
Shrimp							99,460	4,476					283,342	13,912
Total							99,460	4,476					290,935	14,154
Hoop nets and pots: Crabs											61,520	2,000	92,231	3,104
Lines:														
Cod, salted			3,278,284	106,954									5,498,284	180,934
Halibut					45,000	1,860							40,521,605	2,037,744
"Lingcod"													21,400	625
Rockfishes													22,900	567
Sablefish					1,000	25							575,810	13,782
Salmon—														
Chinook					4,600	200							48,000	1,990
Humpback													455	5
Silver					9,000	275							78,000	1,715
Cod tongues			18,000	1,254									30,000	2,090
Total			3,296,284	108,208	59,600	2,360							46,796,454	2,239,452
Dredges, etc.:														
Eastern oysters, market			16,800	9,000									60,319	32,155
Native oysters, market			2,800	1,600									2,975	1,675
Kelp	450,000	191											450,000	191
Total	450,000	191	19,600	10,600									513,294	34,021
Harpoons:														
Whalebone													6,000	4,200
Whale oil													2,635,125	112,851
Other whale products													1,292,000	24,390
Total													3,933,125	141,441
Grand total	1,102,537	12,407	4,875,965	155,032	2,112,467	41,942	146,948	6,141	109,000	2,160	5,752,839	108,577	86,949,151	3,084,800

YIELD OF THE VESSEL FISHERIES OF WASHINGTON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

Apparatus and species.	Grays Harbor.		Island.		Jefferson.		King.		Kitsap.		Pacific.		Pierce.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Dredges, etc.:														
Eastern oysters, market											43,719	$23,155		
Native oysters, market											175	75		
Total											43,894	23,230		
Harpoons:														
Whalebone							6,000	$4,200						
Whale oil	2,575,125	$110,051					60,000	2,800						
Other whale products	1,292,000	24,390												
Total	3,867,125	134,441					66,000	7,000						
Grand total	4,320,125	157,376	135,284	$2,487	102,051	$3,092	47,192,624	1,997,387	7,977,367	$284,726	50,294	23,430	13,071,650	$370,043

Apparatus and species.	San Juan.		Skagit.		Snohomish.		Thurston.		Wahkiakum.		Whatcom.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Seines:														
Herring					275,000	$1,169					20,000	$85	1,980,401	$8,557
Salmon—														
Blueback or sockeye	25,425	$2,288	55,585	$4,446	70,670	5,653					258,790	23,230	1,210,030	105,158
Chinook	2,676	83	65,698	2,209	60,704	2,125			62,500	$1,560	43,908	1,548	517,401	16,538
Chum	103,912	1,688	540,000	12,125	398,904	7,479			24,000	120	1,695,648	27,199	11,631,118	211,437
Humpback	459,300	5,739	762,800	11,442	1,080,048	16,200					3,180,264	36,148	17,222,628	204,261
Silver	60,174	2,381	121,800	5,075	161,460	6,727			20,000	400	492,174	18,335	2,646,291	102,529
Shad			423	13									423	13
Smelt	1,000	35			1,406	50	47,488	$1,665					75,180	2,567
Steelhead trout	50	2	13,787	824	75	4			2,500	80	475	32	19,680	1,110
Sturgeon													200	12
Total	652,537	12,216	1,560,081	36,224	2,048,267	39,407	47,488	1,665	109,000	2,160	5,691,319	106,577	35,303,352	652,182
Gill nets:														
Cod													15,000	265
"Lingcod"													160	6
Salmon—														
Blueback					750	60							750	60
Chinook					250	10							250	10
Chum					400	7							400	7

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF WASHINGTON IN 1915, BY COUNTIES SPECIES, AND APPARATUS—Continued.

BY SEINES—Continued.

Species.	Thurston.		Wahkiakum.		Whatcom.		Whitman.		Total.	
	Lbs.	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*
Carp									200,000	$4,000
Cod									1,800	35
Flounders									21,500	527
Crayfish									1,260,000	2,837
Herring									146,548	1,076
"Lingcod"									1,000	25
Perch									5,300	196
Rockfishes									9,100	535
Salmon:										
Blueback or sockeye	4,980	$440	15,530	$776	5,500	$495	1,250	$87	85,565	4,863
Chinook			94,250	5,655	960	30	2,848	199	522,913	24,419
Chum					32,000	520			363,302	6,519
Humpback	26,304	395			68,000	650			489,176	5,687
Silver	1,878	70			10,800	375	3,688	258	168,130	5,350
Shad			26,828	268					50,387	606
Sharks									54,000	122
Skates									38,000	85
Smelt	74,500	2,610			38,430	1,367			435,101	15,212
Sole									24,900	719
Steelhead trout			8,037	240			3,984	279	149,645	8,957
Sturgeon							100	8	2,700	164
Caviar									150	38
Total	107,662	3,515	144,645	6,939	155,690	3,437	11,870	831	4,029,217	81,972

BY GILL NETS.

Species.	Asotin.		Clallam.		Clarke.		Cowlitz.		Grays Harbor.		Jefferson.	
	Lbs.	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*
"Lingcod"											300	$7
Perch											5,000	125
Rockfishes											1,000	60
Salmon:												
Blueback or sockeye					7,710	$384	9,780	$452	1,242,530	$57,353		
Chinook	30	$2	78,960	$1,976	510,200	30,611	852,125	19,346	498,170	9,938	20	1
Chum			13,490	165	7,900	39	51,200	256	973,962	4,480	4,600	57
Humpback			38,400	1,200			240	3	18,420	231		
Silver			80,148	1,687	6,100	142	21,520	499	727,430	13,957	6,720	193
Shad					19,550	197	8,600	85				
Smelt					50	1	6,000	50				
Steelhead trout	1,040	84			42,412	1,277	119,712	4,117	82,850	4,364	3,560	20
Sturgeon					2,500	130	6,400	320	240	7		
Total	1,070	86	210,998	5,028	596,422	32,781	1,075,577	25,128	3,543,602	90,330	21,200	463

Species.	King.		Kitsap.		Klickitat.		Lewis.		Mason.		Pacific.	
	Lbs.	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*	*Lbs.*	*Value.*
Cod			4,700	$105								
Flounders			600	18								
Perch			1,900	94								
Salmon:												
Blueback or sockeye	88,550	$7,080	9,385	734	90	$5	75	$7			4,240	$332
Chinook	138,420	5,553	3,518	132	2,375	163	7,930	418	3,648	$220	1,231,220	57,806
Chum	252,080	3,780	10,178	215			385	5	3,120	28	226,889	1,110
Humpback	62,480	469	3,376	53							400	5
Silver	258,424	9,927	20,073	817			2,710	77	4,800	175	149,779	2,997
Shad											47	1
Smelt			686	23								
Sole			200	6								
Steelhead trout	70,325	5,605	1,545	117	2,337	165	471	35	1,875	125	33,642	1,288
Sturgeon											11,800	518
Caviar											150	37
Total	870,279	32,414	56,161	2,314	4,802	333	11,571	542	13,443	548	1,658,167	64,094

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF WASHINGTON IN 1915, COUNTIES, SPECIES, AND APPARATUS—Continued.

BY GILL NETS—Continued.

Species.	Pierce.		San Juan.		Skagit.		Skamania.		Snohomish.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Perch	2,500	$75								
Salmon:										
Blueback or sockeye	7,750	622	10,565	$950	12,435	$560	7,755	$386	9,250	$
Chinook	14,640	923	549	14	444,398	20,398	95,375	4,384	75,790	2,
Chum	48,170	301	7,840	127	824,800	15,044	8,750	43	101,414	1,
Humpback	38,488	962	120,288	1,503	82,820	950			27,810	
Silver	50,148	1,505	17,388	724	444,578	17,597	5,000	112	477,989	18,
Shad							100	1		
Smelt	5,100	195								
Steelhead trout	5,812	460			30,302	2,195	10,662	319	31,790	1,
Sturgeon							2,000	100		
Total	172,608	5,043	156,630	3,318	1,839,333	56,744	129,642	5,345	724,043	26,

Species.	Thurston.		Wahkiakum.		Whatcom.		Whitman.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Cod									4,700	$
Flounders									600	
"Lingcod"									300	
Perch									9,400	
Rockfishes									1,000	
Salmon:										
Blueback or sockeye	2,800	$250	3,500	$175	44,740	$3,361			1,461,155	73,
Chinook	330	20	1,346,900	67,331	29,520	1,541	825	$58	5,334,943	223,
Chum	840	5	164,675	849	114,500	1,416			2,814,793	29,
Humpback	3,340	85	700	9	23,372	296			420,134	6,
Silver	2,190	65	68,140	1,376	417,617	16,843			2,760,754	87,
Shad			3,912	36					32,209	
Smelt					5,500	195			17,336	
Sole									200	
Steelhead trout			243,711	7,547	12,150	931			694,196	30,
Sturgeon			5,260	288					28,200	1,
Caviar									150	
Total	9,500	425	1,836,798	77,611	647,399	24,583	825	58	13,580,070	453,

BY BEAM TRAWLS.

Species.	Kitsap.		Pierce.		Thurston.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value*
Flounders	2,600	$150					2,600	$1
Rockfishes	1,700	80					1,700	
Sole	36,000	1,000					36,000	1,0
Shrimp	10,648	745	61,900	$2,785	30,530	$1,277	103,078	4,8
Total	50,948	1,975	61,900	2,785	30,530	1,277	143,378	6,0

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF WASHINGTON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY POUND NETS.

Species.	Clarke.		Cowlitz.		Grays Harbor.		Jefferson.		King.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
rayfish							400,000	$900	100,000	$225
Lingcod"									20,000	250
almon:										
Blueback or sockeye	2,000	$100					23,540	1,883	200,745	11,000
Chinook	145,125	6,100	758,250	$32,100	377,200	$7,544	585,460	$20,491	1,010,240	55,563
Chum	9,200	46	108,750	543	366,300	1,665	228,976	2,862	442,040	11,051
Humpback							816,820	10,210	1,576,004	15,760
Silver	24,000	660	158,500	3,680	527,000	10,540	481,086	16,036	793,716	29,103
had									3,878	160
harks							10,000	22		
kates							6,000	13		
nelt									10,599	375
eelhead trout	23,125	694	36,437	1,092	22,500	1,350	18,575	1,300	93,288	6,997
urgeon	50	3	325	16	1,700	51	2,380	68	2,280	160
Total	203,500	7,603	1,062,262	37,431	1,294,700	21,150	2,572,837	53,785	4,252,790	130,644

Species.	Kitsap.		Klickitat.		Pacific.		Pierce.		San Juan.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
rayfish	220,000	$495							380,000	$855
almon:										
Blueback or sockeye	6,505	520	20,850	$1,042	76,667	$3,828	30	$3	18,325	1,649
Chinook	21,136	870	63,870	2,850	2,890,690	83,262	9,900	645	105,006	2,625
Chum	22,844	1,187			279,693	1,401	47,600	300	472	7
Humpback	11,492	205	1,104	13	1,760	22	3,200	80	321,272	4,016
Silver	30,373	1,471	66,600	1,500	718,607	14,371	9,900	300	165,114	6,879
had					8,223	52				
harks									12,000	26
kates									8,000	18
melt					55	2				
quid							15,000	325		
eelhead trout	2,525	175	37,687	1,136	697,039	23,556	2,185	150	13	1
urgeon	78	5			2,600	104				
Total	314,953	4,928	190,111	6,541	4,675,334	126,598	87,815	1,803	1,010,202	16,076

Species.	Skagit.		Wahkiakum.		Whatcom.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
rayfish					800,000	$1,800	1,900,000	$4,275
erring	2,200	$22					2,200	22
Lingcod"	790,000	1,777					810,000	2,027
almon:								
Blueback or sockeye	480,250	42,074	4,615	$230	1,431,340	98,274	2,264,867	160,603
Chinook	1,397,000	56,375	1,096,921	40,747	2,070,222	87,550	10,531,020	396,722
Chum	383,500	7,460	44,336	224	388,456	8,001	2,322,167	34,747
Humpback	2,892,000	43,060	4,200	52	6,033,348	75,416	11,661,200	148,834
Silver	794,800	31,792	380,748	8,665	2,580,282	66,878	6,730,726	191,875
had	60	2	721	7			12,882	221
harks					5,000	11	27,000	59
kates					3,000	7	17,000	38
melt	600	18					11,254	395
quid							15,000	325
eelhead trout	92,600	5,910	182,301	5,604	35,983	2,521	1,244,258	50,486
urgeon	840	50	503	29			10,756	486
Total	6,833,850	188,540	1,714,345	55,558	13,347,631	340,458	37,560,330	991,115

BY HOOP NETS.

Species.	Grays Harbor.		Pacific.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
rabs	169,885	$5,425	1,097,778	$34,200	1,267,663	$39,625

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF WASHINGTON IN 1915, COUNTIES, SPECIES, AND APPARATUS—Continued.

BY DIP NETS.

Species.	Clarke.		Cowlitz.		Wahkiakum.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Smelt	12,500	$125	1,603,500	$6,530	3,500	$40	1,619,500	$6,

BY REEF NETS.

Species.	San Juan.		Whatcom.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value*
Salmon:						
Blueback or sockeye	6,790	$611	12,500	$935	19,290	$1,
Chinook	5,016	125	.....	.....	5,016	
Chum	8,944	145	.....	.....	8,944	
Humpback	92,948	1,162	21,200	265	114,148	1,
Silver	22,584	941	.....	.....	22,584	
Steelhead trout	225	15	.....	.....	225	
Total	136,507	2,999	33,700	1,200	170,207	4,

BY POTS.

Species.	Clallam.		Grays Harbor.		Island.		Jefferson.		King.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Crabs	26,667	$1,600	85,962	$2,675	112,625	$3,172	2,000	$90	1,793	

Species.	Pierce.		Skagit.		Snohomish.		Whatcom.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Crabs	2,500	$100	46,617	$1,318	10,000	$250	86,352	$2,525	374,516	$11,

BY WHEELS.

Species.	Pacific.		Species.	Pacific.	
	Pounds.	*Value.*		*Pounds.*	*Val*
Salmon:					
Blueback or sockeye	1,600	$80	Sturgeon	100	
Chinook	500	30			
Shad	397	4	Total	5,234	
Steelhead trout	2,637	91			

BY LINES.

Species.	Clallam.		Clarke.		Franklin.		Grays Harbor.		Island.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Grayfish	.....	.....	.....	.....	.....	.....	.....	.....	800,000	$1,
Halibut	42,000	$1,920	.....	.....	.....	.....	.....	.....	.....	
"Lingcod"	.....	.....	.....	.....	.....	.....	150	$2	.....	
Rockfishes	57,000	1,425	.....	.....	.....	.....	3,000	75	1,000	
Salmon:										
Chinook	275,876	6,898	.....	.....	.....	.....	21,635	523	51,156	1,
Chum	15,500	155	.....	.....	.....	.....	.....	.....	.....	
Humpback	22,650	282	.....	.....	.....	.....	750	9	4,200	
Silver	1,453,299	36,234	3,700	$75	.....	.....	55,240	1,332	268,744	6,
Sharks	.....	.....	.....	.....	.....	.....	.....	.....	46,000	
Skates	.....	.....	.....	.....	.....	.....	.....	.....	32,000	
Sturgeon	.....	.....	.....	.....	1,200	$90	.....	.....	.....	
Total	1,866,325	46,914	3,700	75	1,200	90	80,775	1,941	1,203,100	10,

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF WASHINGTON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY LINES—Continued.

Species.	Jefferson.		King.		Kitsap.		Mason.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Cod			300	$9				
Flounders			200	2	400	$32		
Grayfish	560,000	$1,255	604,662	1,362	310,000	697		
Halibut	12,000	960	15,000	645				
"Lingcod"	3,000	90	600	18				
Rockfishes			800	24	650	38	1,000	$35
Salmon:								
Blueback or sockeye			117	9				
Chinook	43,406	1,086	193,662	4,842	80,388	2,010	9,135	230
Humpback	3,450	43	18,400	220	6,600	83	750	10
Silver	265,178	6,629	1,017,388	25,435	422,312	10,558	47,990	1,200
Sharks	18,000	39	180,000	404	6,000	13		
Skates	12,000	29	78,000	173	4,000	9		
Soles					400	12		
Total	917,034	10,131	2,109,129	33,143	830,750	13,452	58,875	1,475

Species.	Pacific.		Pierce.		San Juan.		Skagit.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Grayfish			1,279,334	$2,879	380,000	$854		
Halibut					100	10		
"Lingcod"							500	$12
Rockfishes					2,000	70	1,000	40
Salmon:								
Chinook	95,050	$4,808	159,620	7,240	20,270	510	127,413	3,186
Humpback			9,000	113	1,500	20	10,350	129
Silver	590,300	12,617	575,880	14,397	101,980	2,650	662,762	16,569
Sharks			60,000	135	8,000	17		
Skates			40,000	90	8,000	19		
Steelhead trout	3,500	175						
Total	688,850	17,600	2,123,834	24,854	521,850	4,150	802,025	19,936

Species.	Skamania.		Snohomish.		Whatcom.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Cod							300	$9
Flounders							600	34
Grayfish							3,933,996	8,847
Halibut							69,100	3,535
"Lingcod"							4,250	122
Rockfishes							66,450	1,742
Salmon:								
Blueback or sockeye							117	9
Chinook			68,291	$1,782	82,215	$2,055	1,228,117	36,448
Chum							15,500	155
Humpback			4,950	62	6,750	84	89,350	1,107
Silver			325,134	8,243	431,910	10,798	6,221,817	153,456
Sharks							318,000	708
Skates							174,000	392
Soles							400	12
Steelhead trout							3,500	175
Sturgeon	500	$30					1,700	120
Total	500	30	398,375	10,087	520,875	12,937	12,127,197	206,871

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF WASHINGTON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY TONGS, RAKES, ETC.

Species.	Clallam.		Grays Harbor.		Island.		Jefferson.		King.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Val
Clams:										
Hard	2,520	$190			552	$45	17,944	$1,269	864	
Razor			297,430	$37,736						
Oysters: Eastern, market			875	525			5,250	3,750		
Total	2,520	190	298,305	38,261	552	45	23,194	5,019	864	

Species.	Kitsap.		Mason.		Pacific.		Pierce.		San Juan.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Val
Clams:										
Hard	35,760	$2,371	64,000	$4,111			5,680	$425	4,480	
Soft					1,200	$150				
Razor					75,320	18,710				
Oysters:										
Eastern, market			5,250	2,250	179,228	91,954				
Native			38,654	22,035	9,709	4,755	4,200	1,725		
Seed			8,680	2,530	12,201	5,229	133	47		
Total	35,760	2,371	116,584	30,926	277,658	120,798	10,013	2,197	4,480	

Species.	Skagit.		Snohomish.		Thurston.		Whatcom.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Val
Clams:										
Hard	170	$25	1,700	$242	40,000	$2,743	2,008	$170	175,444	$12,
Soft									1,200	
Razor									372,750	56,
Oyster:										
Eastern, market					14,091	9,394			204,694	107,
Native	560	290			394,296	219,818			447,419	248,
Seed					3,794	813			24,808	8,
Mussels					700	83			700	
Total	730	315	1,700	242	452,881	232,851	2,008	170	1,227,315	433,

NOTES ON SPECIES.

Halibut.—Halibut is the most valuable species taken in the fish eries of Washington. The value of the catch in 1915 was near three times as great as that of chinook salmon, the next species i importance. The total production was 40,590,705 pounds, with value to the fishermen of $2,041,279, as compared with 15,897,15 pounds, valued at $458,375, in 1904. The halibut were all take with lines, and all but 69,100 pounds were taken in the vessel fish eries. Halibut on the Pacific coast average smaller in size than o the Atlantic coast.

The halibut vessel fishery on the Pacific coast really began whe the schooners *Oscar and Hattie* and *Mollie Adams*, from Massachu setts, rounded Cape Horn and reached Puget Sound in 1888. Th first fishing by these vessels was done during the summer and fall o that year, and the trips would have been very successful had it no been for the high price of ice. The total catch of the two vessels fo the season amounted to 570,000 pounds of fresh and salted halibu valued at $18,400. Some difficulty was at first experienced in freezin and getting the fish to the Atlantic coast markets in good condition but with the introduction of refrigerator cars no further difficulty ha

been encountered, and the shipments have steadily increased. The halibut fleet has increased from the 2 sail vessels just mentioned, in 1888, to a fleet of 97 vessels in 1915, most of them hailing from Seattle. While sail vessels were at first employed in the fishery, in 1915, with the exception of 5 steamers the halibut fleet consisted entirely of gasoline vessels, ranging in size from a few boats under 5 net tons to one of 115 net tons, and were usually owned by corporations. The crews vary from 5 to 19 men on the gasoline boats and from 37 to 44 men on the steamers. Some of the smaller boats do not carry any dories, the fishing being done from the deck. A large majority of the vessels are engaged exclusively in the halibut fishery, but a few discontinue purse seining at times to catch halibut. The number of dories carried varies from 2 on the small gasoline vessels to 12 on the larger steamers. The engineer, cook, and deck hands of a halibut vessel very seldom do any fishing.

Halibut are caught exclusively on trawl lines. The amount of gear used to a vessel ranges from 2 to 8 skates, a skate having a uniform length of 220 hooks placed 9 feet apart. There are ordinarily 7 lines, each 50 fathoms in length, to a skate. The lines are always set with the tide and wind. The men usually start out at about daybreak, and sometimes lines are set as late as 5 p. m. The gear is allowed to remain out about an hour before fishing is begun. From three to four hours are required to lift and fish a gear, the time varying according to amount set. The baiting is done on the fishing grounds just before setting out the lines. From the latter part of November to the last of January torches are used early in the morning and in the evening while fishing. The hooks commonly used are the Arthur James and Mustad hooks, Nos. 6283 and 6284, and are seized on the line with No. 12 linen twine.

Herring is the principal bait used; salmon are also used, but only in small quantities. Large numbers of herring from Puget Sound are utilized, but the main supply comes from Alaska, where many fishermen are occupied exclusively in catching bait for halibut vessels. In starting on a halibut trip it is customary to take 10 barrels of bait to each dory. A steamer will sometimes take as much as 200 barrels of herring on a trip. Bait is taken from Seattle only when going on a short trip. The herring bait is always used fresh, and in 1915 the cost was about $2 per barrel of 200 pounds. The price was about the same in Alaska.

In the early days of the fishery halibut were taken almost exclusively in the vicinity of Cape Flattery, but now the vessels go from 150 to 1,500 miles from Seattle, the nearest fishing bank being the one off Cape Flattery and the most distant one the Portlock Bank. The average length of a trip is 15 days, but some trips to nearby banks are made in 7 or 8 days. Besides the halibut banks already named, Hecate Straits and Yakitat Bank may be mentioned. The most prolific of these is Hecate Straits, 350 to 500 miles from Seattle. Very few vessels from Seattle go farther north than these grounds. While in that region the most convenient place for rebaiting is at Prince Rupert, Canada. In recent years, under an order in council passed at Ottawa, United States vessels can buy bait only upon condition that the catch is landed at Prince Rupert. This has had a depressing effect upon the halibut trade of Seattle, resulting in some of the larger wholesale firms moving to Prince Rupert.

Halibut are prepared for market by eviscerating and filling cavity with ice. They are then covered with ice and kept in pens the hold of the vessel to prevent them from sliding around. T heads of the fish are cut off upon the arrival of the vessel at the ho dock.

The fishery is followed throughout the entire year except when vessel is laid up for repairs. Owing to the long distance traveled a the rough weather often encountered, halibut fishing constitute dangerous occupation, some men being lost every year. In 1915, men were lost.

In the early days of the halibut fishery the local demand was lig a vessel load of 20,000 pounds being sufficient to supply it. addition to halibut, the vessels also bring in small quantities sablefish, the total quantity in 1915 amounting to 575,810 poun valued at $13,782. This species is one of the most palatable fis found on the Pacific coast, or elsewhere. For some unaccounta reason it has not been utilized to any great extent, but the indi tions now are that increasing quantities will be brought in annual

Salmon.—The total catch of all species of salmon, including ste head trout, in 1915 amounted to 91,130,492 pounds, valued $2,330,474. The catch of the different species in the order of th importance was as follows: Chinook, 18,188,160 pounds, valued $699,771; silver, 18,630,302 pounds, valued at $543,241; humpba 29,998,291 pounds, valued at $367,521; blueback or sockeye, 5,043,3 pounds, valued at $345,810; chum, 17,156,244 pounds, valued $282,842; and steelhead, 2,114,141 pounds, valued at $91,389. T greater part of the catch was utilized in canning. Large quan ties were also used for freezing, smoking, salting, and mild curi From the above, it will be seen that the fishermen received t following average prices per pound for the different species: Bl backs, $6\frac{4}{5}$ cents; steelhead trout, $4\frac{3}{10}$ cents; chinook, $3\frac{4}{5}$ cents; silv $2\frac{9}{10}$ cents; chum, $1\frac{3}{5}$ cents; and humpbacks, $1\frac{1}{5}$ cents.

Chinook.—Chinook salmon are taken in every county of the St having fisheries, but Pacific County, with a catch of 4,371,135 poun is far in the lead. The greater part of the catch is taken in t Columbia River. The pound-net fisheries at Chinook and gill-n fisheries at Ilwaco contribute a large part of the catch. Wahkiak County, situated entirely on the Columbia River, ranks next Pacific County, with a catch of 2,600,571 pounds. There are seve very important fishing points in this county, but Cathlamet, with valuable pound-net and gill-net fisheries, is the leading one. Wh com and Skagit Counties, both on Puget Sound, also furnish la catches of chinook, pound nets being the principal apparatus capture. Cowlitz County, on the Columbia River, and King Coun on Puget Sound, are also deserving of mention for their output chinook. This species is taken commercially as far from the co as in the Snake River at Clarkston, Wash., opposite Lewiston, Idah It is an important item in the seine catch of that vicinity.

Chinook are found during the entire year in Washington, but t best catches are made between May 1 and September 15. Chino average in size from 20 to 25 pounds, but some weighing 100 pou have been taken. The size varies with the apparatus used. T average size of those taken in gill nets is probably less than th taken with some of the other apparatus, as a gill net with an ex

nesh, say from 8½ to 10½ inches, is necessary for the larger chinook, nd comparatively few fishermen have these extra nets. Fishermen ometimes call the chinook "springs" until they are ready to spawn; fter that they turn dark in color and are called "jacks." Large umbers of chinook are caught by trolling, but in 1915 the silver almon replaced that species in importance. While large quantities f chinook are smoked, mild cured, and frozen, more than one-half f the entire catch is utilized for canning. There has been an increase n the output of this species since 1904 of 2,976,377 pounds, but a lecrease in value of $1,784.

Silver salmon.—Silver salmon are taken quite generally throughout he waters of the entire State, Columbia and Garfield Counties on he Snake River alone failing to report any catch. The total output f Puget Sound was 14,753,946 pounds, as compared with 1,871,673 ounds credited to the Columbia River. A small quantity was taken ommercially in the Snake River as far up as Clarkston, Wash. More han two-thirds of the total output of the State was utilized for can- ing. Large quantities were also salted and frozen. Pound nets and nes are the most important forms of apparatus used in taking silver almon, two-thirds of the catch being taken by this means. The reater part of the remainder were taken in gill nets. Silver salmon ollow bluebacks and run mainly from September 1 to the end of he year, but are scarce in December. They are of a more uniform veight than chinook, an average for the entire State being from 6 to 8 ounds, though some weighing 30 pounds have been taken. The utput for 1915 as compared with that for 1904 shows a decline f 7,390,885 pounds and an increase of $40,220 in value.

Humpback.—Humpback salmon are important only on account of he large catches made, as the average price in 1915, as already hown, was only 1⅓ cents per pound. The total output was nearly ne-third of that of all species of salmon combined. In 1915 this pecies constituted about one-half of the purse-seine catch, which is he most important apparatus used in their capture. Practically the ntire catch is taken in the Puget Sound region and is utilized almost xclusively for canning. The average weight of the humpback is bout 4 pounds. They are taken mainly in the summer and fall and ppear in increased numbers every two years.

Blueback or sockeye.—This is the most valuable of all the salmon, s the average price, 6⅔ cents per pound, paid in 1915, indicates. By eason of the bright-red color of the meat and its rich flavor it is he most highly prized of the salmon for canning. More than one- alf the catch was taken in the Puget Sound region, but the Quinault River in Grays Harbor County contributed most of the remainder. The blueback run extends from July 15 to the latter part of August. During this time they are being followed by purse-seiners through he Strait of Juan de Fuca to the south side of San Juan County and hence up the Rosario Strait northward to the Canadian line. The lueback is termed a Canadian fish by reason of being taken by American fishermen on its way to its spawning grounds in the Fraser River, Canada. Bluebacks sometimes reach a weight of 12 pounds, ut the average weight is about 5 pounds. Heavy runs of this species ccur periodically every four years, the last one being in 1913. It vill thus be seen that 1915 would naturally be a slack year. The ears of these large runs are called "big years." As compared with

1904, the canvass for 1915 shows a decline in the output of this spe of 6,464,036 pounds in quantity and $181,678 in value.

Chum.—Next to the humpback, this species commands the lo price of any of the salmon. The average price per pound in 1 was 1⅗ cents. They are taken mostly in the Puget Sound region, p seines being the chief means of capture, though large quantities also taken with gill nets and pound nets. The run begins about S tember 20 and continues until the end of the year. Most of the c is utilized for canning, but considerable quantities are sold fro The average weight of the chum salmon is about 8 pounds, tho some weighing as much as 12 pounds have been taken. There been an increase in this species since 1904 of 3,504,056 pounds, va at $151,402.

Steelhead trout.—This species is taken very generally in the wa of Washington but is much more plentiful in the Columbia Ri more than one-half of the State's entire catch being credited to river. More than one-half of the catch was taken in pound nets most of the remainder in gill nets. This fish is found in the Sn River as far up as Clarkston, Wash., and constitutes the most portant part of the catch at that locality. It is more plentiful du the winter and until March 15, which accounts in a measure for good price received. It is said to be not so attractive for eating ing part of the spring and summer seasons. The skin then is in color, though the flesh is white. It is also quite thin at this t following the spawning season. In 1915 the fishermen receive an average about 4 3/10 cents per pound. Only a small proportio the catch is used for canning, as the steelheads are taken in lar quantities when the canneries are closed. Some are frozen, the demand for the fresh fish usually equals the supply. St head, like chinook salmon, vary much in weight, but an ave would be about 12 pounds, though some reach a weight of as m as 45 pounds. There has been a fair increase, both in pounds value, of this species since the last canvass for 1904.

Cod.—Eight schooners owned in Washington, with a combi crew of 268 men and 156 dories, made their annual trip to Alas waters in 1915 to prosecute the cod fishery. These vessels ran from 138 to 413 tons net tonnage. The result of the trip was 5,498 pounds of salt cod, valued at $180,934, and 30,000 pounds of tongues, valued at $2,090. The round weight of the fish was 745,710 pounds. Four of these schooners were from King and from Skagit Counties. The catch, which was taken entirely hand lines, was dry-salted in Alaska and taken to Seattle Anacortes, the hailing places of the vessels, where the fish were salted and otherwise prepared for market.

The vessels usually leave their home ports about the middl March, and after three weeks sailing arrive in the neighborhoo Shumagin Islands, in the North Pacific. They are then appr mately 1,553 nautical miles from Seattle. As the fishing is follo mostly during the summer season, they have the advantage of l hours of daylight. The period of darkness during the fishing sea rarely exceeds four hours, and is even less during June and J Fishing with trawl lines for cod has been followed to some exten the past, but very seldom now. The fishermen seem to prefer

ıe of hand lines. The catch of cod has more than doubled, and the ılue nearly trebled since 1904.

Smelt.—Smelt are taken in most of the counties bordering on Puget ɔund, but the fishing is usually incidental to the salmon fisheries of ıis region. The fishing season is from August 1 to April 30; during ay, June, and July the season is closed. Until recent years the fish-ıg season extended throughout the entire year. Short seines are ɜed, the length ranging from 80 to 100 yards on an average and the ɛpth from 200 to 400 meshes. The bunt is 25 yards long and is of or 9 thread cotton twine with 1-inch mesh, while the wings are of thread twine with 1¼-inch mesh. A seine is usually fished by vo men.

Under smelt in this report are included eulachon, or candlefish, hich are usually taken in the Cowlitz River near Kelso. In 1915, ɔwever, that river was so muddy that they continued up the ɔlumbia to the Lewis River, where practically the entire catch was ıade. The fishing season is from January 1 to April 1, and they ɾe taken in such large quantities that they soon glut the market. he price usually varies from $5 a box of 50 pounds, early in the ɛason, to 10 cents a box after the season is well advanced. The ıtput goes largely to Portland. Dip nets are the only form of ɔparatus used in the fishery. Since 1904 there has been an increase the catch of 788,049 pounds, but there has been a decrease of 1,570 in value.

Grayfish.—This species in 1915 was used exclusively in the manu-ıcture of fertilizer and oil. The total output used for this purpose mounted to 7,093,996 pounds, valued at $15,959. This is a new ıdustry, as no grayfish were reported in the last canvass of this ɛgion by the Bureau covering the year 1904. They were taken ıainly with seines and set lines, and often by men not regularly ıgaged in fishing.

Herring.—Herring are used almost exclusively for halibut bait. ractically the entire catch is taken in haul seines, principally in the ɛssel fisheries. Many purse-seine fishermen also have short-haul ɛines, which they use whenever the opportunity offers for making good haul of herring. Some are sold to the halibut vessels direct ıd the remainder to dealers, mainly in Seattle, who freeze them for ɜe later in the season. The increase in the herring output from 31,750 pounds, valued at $3,155 in 1904, to 2,129,149 pounds, valued ɬ $9,655 in 1915, is due to the growth of the halibut fishery.

Sturgeon.—Sturgeon are found in small quantities in most of the ıaters of the State but are more frequent in the Columbia River. acific County, on the latter stream, with a catch of 17,100 pounds, ılued at $784, and 300 pounds of caviar, valued at $75, leads all ther counties in this fishery. This species, as in eastern waters, ıows quite a marked decline. The total catch for Washington in 915 amounted to 43,656 pounds, valued at $2,151, as compared ith 125,127 pounds, valued at $4,050, in 1904.

Rockfishes.—Puget Sound is the northern limit for the black rockfish, ıe most important catches being made by Indians fishing with hand ıes in the vicinity of Neah Bay. Considerable quantities are also ıken in that region by troll fishermen, and small quantities with ɛt lines in various localities. Red rockfish are not taken com-

mercially as far north as Washington. The total catch of rockfish for the State in 1915 was 101,351 pounds, valued at $2,995, as co pared with 82,700 pounds, valued at $3,498, in 1904.

Sole.—Sole are found in only small quantities as far north Washington. Practically the entire catch was made with bea trawls, a few men in Kitsap County making a special fishery of This species is taken commercially in only four counties of the Sta all on Puget Sound. The catch increased from 9,000 pounds, valu at $180, in 1904, to 68,062 pounds, valued at $1,951, in 1915.

Carp.—No commercial fishing for carp is followed in any of t streams of Washington, except the Columbia River, and in only o locality on that river. The total output in 1915 amounted to 200,0 pounds, valued at $4,000, which were shipped mainly to Seattle a Portland. Some were sent as far east as Butte, Mont. It is like that the output could be increased were the markets to justify it.

Clams.—There has been quite a decline in the output of hard cla in Washington since 1904. The catch in 1915 was 21,968 bushe valued at $12,191, as compared with 96,821 bushels, valued $54,512 in 1904. The counties leading in the production of ha clams are, in the order of their importance, Mason, Thurston, Kitsa and Jefferson. Several other counties produced small quantiti Olympia is the center of the hard-clam industry of the State. T hard clams are packed there in hermetically sealed cans of many siz from 1 pint to 5 gallons and shipped as far east as Chicago. Th are always shipped raw. The output of soft clams in the State 1915 was insignificant. In the report for 1904 razor clams we tabulated with the soft clams, but in this report they are separate

The output of razor clams in 1915 was 37,275 bushels, valued $56,446. While the returns for 1915 show a substantial increase compared with 1904, it is likely that the industry has been ov worked, as some firms have dismantled their canneries and mov the machinery to Alaska for operation there.

Razor clams are found exclusively along the ocean beach of Gra Harbor and Pacific Counties. In Oregon they are found for only short distance along the ocean beach from the mouth of the Columb River south. They are taken between tides at extreme low wat the width of the beach on which they are taken being about 50 yar The fishing can be done only on "minus" tides; that is, tides runni below mean low water. Considerable skill and dexterity are requir in capturing them, as they are very quick in their movements. the first effort with the shovel to catch one is not successful, chances of getting it at that time are gone. The method followed to insert the shovel quickly in the sand below the clam and make quick upward movement, the fisherman placing his hand under t shovel to catch the clam in its efforts to retreat. The legal seas for taking razor clams is from September 1 to May 31, the remaind of the year constituting a closed season except for family use. B it is not always possible during the open season to catch them, the particular stages of the tide when they can be taken occur only certain intervals.

A brief description of canning razor clams follows: The clams a first put in a hot bath to loosen the shells. After going through t bath, the shells are removed either by hand or by a shelling machi consisting of an endless chain or pulley. Both methods are f

ed. The shells being removed, the clams then go to women who
ove the intestines, after which they are sent to the chopper.
m the chopper they are fed into the cans, and the latter are sent
the sealing machines and thence to the retort, which completes
operation, except labeling. The approximate time the cans are
in the retort varies from 45 minutes to 2 hours and 20 minutes,
ording to the temperature. The first clam cannery in Washington
s established in Seattle in 1875, and had a capacity of two hundred
ound cans a day.

Oysters, native and eastern.—The total production of oysters in
shington in 1915 amounted to 64,342 bushels of native oysters,
ued at $250,298, and 37,859 bushels of eastern oysters, valued at
40,028. This indicates an average price per bushel of $3.89 for
tive and $3.69 for eastern oysters. Comparing the production of
tive oysters in 1915 with that of 1904, we find a loss of 58 per cent
quantity but only 10 per cent in value. The eastern oysters
ring the same period show a decrease of less than 2 per cent in
antity and an increase of 14 per cent in value. An illustration
the decrease in the output of native oysters is shown in Pacific
unty. In 1904 the production in that county amounted to 60,000
shels, while in 1915 it had dwindled to 1,412 bushels. This has
ntributed to increasing the price of native oysters along the entire
cific coast.

Olympia is the center of the native oyster industry of the State,
d Shelton, in Mason County, also has a thriving oyster industry.
ny of the inlets near these two towns are utilized for oyster-planting
rposes. More native oysters are produced in the vicinity of these
o towns than in all the remaining towns of the Pacific coast
mbined. Conditions seem well adapted here to their cultivation.
ry few eastern oysters are handled at these places. The oyster
ason of this region in 1915 suffered a handicap by reason of a freeze
curring toward the end of the season, which killed large numbers
oysters. In the earlier days of the industry the grounds were
ways bare at low water, and many oysters died during the cold
ather. To prevent this, dykes were built to hold the water and
sen the exposure of the oysters to the weather. Another and
obably the main reason for building the dykes, however, was to
tablish a seed-producing area, as the public reserves had then
come very much depleted, and it was difficult to secure seed with
ich to stock the grounds.

It is said that the first attempt at native-oyster cultivation in the
cinity of Olympia was about 1880, and the business has been
ntinued ever since. The supply does not meet the demand, and
r this reason the oysters are often sold before reaching maturity.
nother probable reason, however, for early marketing is to avoid
e danger of freezing when the tide is out. The dykes have to a
nsiderable extent lessened this danger. Shells have been planted
thin the dykes for the collection of spat and also to prevent the
sters settling in the mud.

The average oyster season is from early in September to early in
ay. Some of the oysters are shipped in the shell, but a majority
e shucked and shipped in cans of various sizes, holding from 1 pint
5 gallons. The cans are hermetically sealed, but the oysters are not
oked. Shipments are made as far east as Chicago. It is likely

that about one-half the output goes out of the State, mostly
California, Oregon, Idaho, Utah, Montana, and some to Brit
Columbia. As is well known, this native oyster is very much smal
than the eastern one.

The eastern oyster is produced in several counties of the St
from Samish Bay, in Skagit County, to Willapa Harbor, in Pac
County, but 84 per cent of the output is from the latter wat
Shoalwater Bay, an arm of Willapa Harbor, is especially suitable
the culture of the eastern oyster, and it is said that so far as kno
the southern part of this bay is the only place on the Pacific co
where the eastern oyster will propagate and successfully devel
The most important oyster centers in this region are Nahcot
Tokeland, South Bend, and Bay Center. Little attention is paid n
to the native oyster at these localities as compared with times pa
It is authoritatively stated that the first eastern oyster was broug
to Willapa Harbor for planting in 1894. The shipment was ma
by J. & J. W. Ellsworth Co., of New York, under the direction of t
U. S. Fish Commission. Although conditions seemed favorable
the continued planting of eastern oysters in this region, practica
nothing more was done for several years, due largely to the freig
rates, which were almost prohibitory. About the year 1900 t
business took on new life and continued to grow until 1907, when
slacked up from lack of demand. Little planting was done duri
the following years until the spring of 1912, when six carloads
seed oysters were brought from the east and planted. Allowing t
usual time for maturing, these oysters were probably marketed
1914 and 1915. The planters seem to prefer "set" for planting,
they can get more out of a bushel and they develop into a bet
oyster than older stock. The demand for eastern oysters is now
great that they are rarely left on the beds after reaching 3 years
age. The high freight rates and heavy mortality contribute larg
to the high price of these oysters. Some Japanese oysters have be
planted in Willapa Harbor, but they did not meet with sufficie
favor to justify further planting.

The oyster grounds occupied by planters in Washington have be
purchased and deeded by the State to the owners. This deed ho
good only so long as the land is devoted to oyster culture.

Seed oysters.—During the year 1915, 3,544 bushels of seed o
ters, with an estimated value of $8,619, were taken by plant
from State reserves. The reserves are tidewater grounds own
by the State, certain portions of which are opened up to plant
each year between April 1 and June 15 for taking seed stock. Ea
planter is allowed 500 sacks of 120 pounds each for every acre p
pared by him for seeding, and no seed stock can be sold.

Crabs.—Crabs are taken entirely with hoop nets and pots, t
total catch with both forms of apparatus in 1915 amounting
1,734,401 pounds, having a value to the fishermen of $54,526, sho
ing an increase since 1904 of 174 per cent in quantity, and 102
cent in value. All but 92,231 pounds, valued at $3,104, were tak
in the shore fisheries. Crabs are taken commercially in almost
of the counties bordering on Puget Sound and in Grays Harbor a
Pacific Counties bordering on the ocean. In the two last-nam
counties the fishing is followed almost entirely in the ocean. T
most important coast centers in the State are Bay Center, T

and, and South Bend, in Pacific County; Westport, in Grays Harbor County; Utsaladdy, in Island County, and Dungeness, in Clallam County.

Shrimp.—The total catch of shrimp in 1915 amounted to 386,420 pounds, valued at $18,719, taken entirely with beam trawls. Nearly three-fourths were taken in the vessels fisheries and the remainder in the shore fisheries. They were taken in all parts of Puget Sound, but the greater part of the shrimp fleet was owned and operated from Olympia and Tacoma and vicinities. An important industry in Olympia is the picking out and shipment of shrimp meat.

Whales.—The whaling industry of Washington, aside from some work done in Bering Sea by a coasting steamer owned in Seattle, was confined entirely to one locality in Pacific County. Three steamers are employed from the latter place and a plant is located here for the manufacture of fertilizer and oil from the whales.

These steamers go from 20 to 150 miles from port in search of whales. Four species of whales are taken; finbacks, sperm, humpbacks, and sulphur-bottom. In 1915, 252 humpbacks, 66 finbacks, 5 sperm, and 1 sulphur-bottom were taken. Some whalebone was taken by the whaling steamer out of Seattle, working in Bering Sea, but that taken from the whales captured by the steamers from Pacific County was not of sufficient length to give it any commercial value.

Practically every part of the whales taken by the Pacific County steamers was utilized, except the water extracted from them. The flesh, blood, and bones contributed to the manufacture of fertilizer. As soon as the whale is brought in, unless it be at night, the blubber is stripped off and the meat cut into chunks of about 10 pounds each. The bone is then chopped up and put into tanks, after which the cooking process begins. The meat is put into vats holding 6 tons each, where it is boiled until thoroughly cooked, the oil being extracted while cooking by dipping it off by hand with long-handled dippers. This applies to oils Nos. 2 and 3, known as whale oil. The meat is then put into a press and the residue of oil extracted, after which it passes through a drier and comes out as dry scrap, in which shape it is sold; as it contains 15 per cent of ammonia it is considered a high-grade material for fertilizer.

After stripping off the blubber it is passed through a slicer into boiling tanks, having a capacity of 20 tons each, where it is cooked in the same manner as the meat. After cooking, it is allowed to stand until the following day, when the oil is run off into oil coolers or collectors, when it is ready for market. Practically all of the oil from the blubber is No. 1. The different kinds, or grades of oil are all manufactured in exactly the same manner, the difference in grades being determined by the colors. No. 1 is white, No. 2 is dark straw color, No. 3 is still darker, and No. 4 is almost black. The fresher the whale, or the more quickly it is utilized after killing, the better the oil secured. The latter gets dark by holding the whale.

Most of the oil is sold to soap manufacturers, one large firm in the Middle West getting the greater part of it. It is all shipped in tank cars. The best grade is an excellent machine oil.

In the case of the sperm whale the oil is extracted by ta
the head of the whale and letting the oil run out into a vat.

The bone of the whale is boiled in the same manner as the
After the oil is extracted, the bone is taken out into an open
and allowed to remain there for several months, or until the e
the season, in October, when it is ground and put through a
and then through a mill, when it is ready for market as bone
This is considered a good fertilizer without other ingredients
so sold. An analysis has shown that it contains 23.79 per ce
phosphoric acid, which places it among the high-grade ferti

Ratfish.—This fish is quite common along the Pacific coas
as yet no commercial use has been made of it. It is often fou
men fishing for grayfish. The liver of this fish is said to furni
oil better even that cod-liver oil for tuberculosis and kindre
ments, and is quite extensively used in the Scandinavian cou
and in Germany.

WHOLESALE FRESH-FISH TRADE.

The most important wholesale firms of the State, aside from
neries, are located at Seattle, though a considerable fresh-fish
is done at Tacoma and Everett, especially the former city
1915 there were 14 firms in the State handling fresh fishery pro
only. The value of these establishments was $153,075, the
capital invested was $26,100, the number of persons engaged
79, and the wages paid amounted to $50,350. Three of these
which handled crabs, cooked a few of the crabs before shipme

FISHERY PRODUCTS PREPARED, EXCLUSIVE OF CANNING

The total amount of fish frozen in the State was 8,81
pounds, valued at $371,854. This includes fish frozen by refrige
plants for wholesale dealers. The most important species f
based on their value, were halibut, chum, silver, and chinoo
mon, and herring, the latter being utilized mostly for halibut
Sablefish and smelt were also frozen in considerable quantities

The mild-cured trade in Washington was confined to ch
and chum salmon, divided as follows: 1,208,800 pounds of ch
salmon, valued at $130,052, and 83,000 pounds of chum sa
valued at $2,060. The mild curing was all done at Seattle, Ta
and Altoona, Wash.

The wholesale salting trade in 1915 amounted to 1,78
pounds, valued at $106,493, most of it being silver salmon.
siderable quantities of halibut and sablefish and small quan
of several other species were also salted. Seattle and Tacoma
the headquarters for the salting trade.

The smoking of fish was quite an important industry in the
The total quantity smoked in 1915 was 2,058,210 pounds, hav
value of $193,301. The principal smoking centers are Se
Tacoma, Everett, and Bellingham. Chinook salmon and sab
were the most valuable smoked fish, though halibut, cod,
salmon, and herring also were smoked in considerable quant

The following is a brief description of a smokehouse and meth
smoking: A smokehouse is approximately 15 by 30 feet and 3 s

high from the basement to the roof. A square or round building is preferable, so as to insure a more even distribution of heat and smoke. The fire is maintained in the center of the building, in the basement or on the first floor. Each fish is hung on three sticks, or on metallic hangers, depending upon the size to be smoked. Small fish are placed on sticks and large ones on metallic hangers. They are suspended from the second and third floor levels. A slow fire is maintained from four to seven days, depending upon the kind of fish to be smoked. Alder wood and hardwood sawdust are used entirely. Sawdust is used to make a smoldering fire with a great deal of smoke but little heat. The kippering process differs from the regular smoking process only in that the fish are placed on trays similar to a broiler in the oven at home, and the alder-wood fire is maintained up to the neighborhood of 300° F. for two hours. By this time the fish is thoroughly cooked from the heat and cured by the smoke. It is then ready to eat.

Among the miscellaneous fishery products prepared were 1,927 tons of fertilizer from fish and fish offal, valued at $77,560; 171,245 gallons of oil, valued at $50,555; 41,038 gallons of glue, valued at $36,200; 212 tons of poultry feed, valued at $10,370, from the same source; 133,689 pounds of shrimp meat, valued at $38,303; 5,000 pounds of potash, valued at $1,125, from kelp; and 150 tons of ground clam shells, valued at $1,500. The oil mentioned above is used largely for tanning leather, while some made from grayfish livers is used in the manufacture of fine grades of soap. It is also said to be good for medicinal purposes, but no such trade has yet been established.

Statistics for products prepared, exclusive of canning, in Washington in 1915 are shown in table, page 54.

CANNING INDUSTRY.

In 1915 there were in Washington 76 canneries, distributed by districts as follows: Forty-nine, valued at $4,541,103, in the Puget Sound region; 15, valued at $318,685, in the Grays Harbor district; 7, valued at $164,900, in the Willapa Harbor district; and 5, valued at $293,329, on the Columbia River. A total of $424,000 working cash capital was employed, 4,525 persons were engaged, and $1,279,787 were paid in wages. Of these canneries all but a few were engaged in canning salmon. The remainder handled clams, clam juice, oysters not cooked, oyster cocktails not cooked, and shrimp cocktails. Some of the salmon canneries included in their output a few cases of canned shad, shad roe, clams, and clam juice. The total pack of salmon in the State was as follows: 590,378 cases of humpback, valued at $1,772,565; 178,464 cases of chinook, valued at $1,400,220; 450,409 cases of chum, valued at $1,219,061; 206,508 cases of silver, valued at $1,036,859; 91,720 cases of blueback, valued at $932,394; and 10,270 cases of steelhead trout, valued at $64,860. The other canned products consisted of 49,337 cases of clams, valued at $211,008; 270 cases of clam juice, valued at $1,050; 7,505 gallons of clams not cooked, valued at $4,066; 4,944 gallons of clam juice not cooked, valued at $2,427; and 49,103 gallons of oysters not cooked, valued at $120,513. A case of salmon represents 48 pounds, but there is no uniform weight to a case of clams. The clams indicated as not cooked

are put up in hermetically sealed cans, which, if stored on ice, keep from one to three weeks and are sometimes shipped as far e as Chicago. This applies also to the clam juice and oysters.

As the heaviest runs of salmon in the Puget Sound region oc during the warmer weather, it is difficult to keep the fish in good c dition very long, and for this reason it was soon recognized as nec sary that the canneries be located as near the salmon grounds possible. In the early stages of the industry some canning was d at West Seattle, but it was discontinued after the buildings w twice destroyed by fire. The most important salmon-canning cent of Washington now are Anacortes, Blaine, Everett, and Bellingha all being favorably located to the fishing grounds. Many of the c ning companies still maintain offices in Seattle.

In 1915 a company in Whatcom County smoked the salmon bef canning. The following is a brief description of the process throu which the salmon passed before being canned: The salmon are fi placed in a concrete tank, from which they are taken and pas through a machine which cleans and eviscerates them and cuts off t heads and tails. The fish, after being cut into sizes suitable to t size of the can, are taken to the smokehouse, where they are put trays. Extending lengthwise down the middle of the smokeho from floor to ceiling are 12 inclosed compartments or chambers, 8 12 feet in size. Each of these chambers holds 56 wire trays, 2 by feet in size, divided into groups of 14, placed one above the oth The bottom tray is 27 feet above the fire and 20 feet below the top the building. That part of the chamber holding the trays is abou feet in height. There is a ventilator over each chamber extending c through the roof of the building. A draft hole near the bottom each chamber or floor of the building enters the space where the f is located. The salmon remain in the chambers about 24 hou or a trifle less. The capacity of this smokehouse is 35,000 poun Alder wood was at first used, but it has since been replaced by o This building was built only recently, and it is therefore believed possess the most modern ideas.

An advantage to the dealer in smoking the salmon before canni is that it gives the inferior grades of fish the same color as those o higher grade, such as the blueback. The dealers claim that there not nearly so much difference in the quality of salmon meat as t color would seem to imply. In proof of this statement it is said th fish brokers have been unable to distinguish between smoked chu and smoked blueback.

Extent of the Canning Industry of Washington in 1915, by Districts.

Items.	Puget Sound.		Columbia River.		Grays Harbor.		Willapa Harbor.		Total.	
	Number.	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
Establishments	49	$4,541,103	5	$293,329	15	$318,685	7	$164,900	76	$5,318,017
Cash capital	.....	279,700	.....	26,000	.....	73,700	.....	44,600	.....	424,000
Persons engaged	3,494	.....	209	.....	682	.....	140	.....	4,525	.....
Wages paid	.....	1,042,338	.....	107,290	.....	95,509	.....	34,650	.....	1,279,787
PRODUCTS.[a]										
Salmon:										
Chinook—										
1-pound tall....cases	11,553	54,726	17,697	134,069	2,997	13,585	6,030	36,620	38,277	239,000
1-pound flat....do	[b]7,104	37,872	55,240	436,004	3,084	11,147	9,723	76,408	75,151	561,431
1-pound oval....do	.....	.....	.....	.....	.....	.....	192	1,632	192	1,632
½-pound flat....do	4,999	47,896	47,710	438,461	1,999	16,583	10,135	95,217	64,844	598,157
Blueback or sockeye—										
1-pound tall....do	579	4,429	550	4,290	968	6,776	.....	.....	2,097	15,495
1-pound flat....do	8,350	71,542	.....	.....	2,073	16,584	8	64	10,431	88,190
½-pound flat....do	55,384	594,999	1,267	11,735	22,323	219,795	218	2,180	79,192	828,709
Silver—										
1-pound tall....do	116,694	551,760	1,985	9,925	9,925	39,947	4,932	19,799	133,536	621,431
1-pound flat....do	27,884	142,766	200	920	1,693	7,701	.....	.....	29,777	151,387
½-pound flat....do	38,005	231,539	1,794	12,913	1,779	8,315	1,617	11,274	43,195	264,041
Humpback—										
1-pound tall....do	551,516	1,608,153	.....	.....	525	1,940	.....	.....	552,041	1,610,093
1-pound flat....do	[c]11,128	37,243	.....	.....	.....	.....	.....	.....	11,128	37,243
½-pound flat....do	27,094	124,631	.....	.....	115	598	.....	.....	27,209	125,229
Chum—										
1-pound tall....do	407,706	1,105,465	9,575	23,956	25,450	66,138	6,243	18,325	448,974	1,213,884
1-pound flat....do	733	2,345	.....	.....	27	50	.....	.....	760	2,395
½-pound flat....do	657	2,710	.....	.....	18	72	.....	.....	675	2,782
Shad:										
1-pound tall....do	.....	.....	1,228	3,684	.....	.....	.....	.....	1,228	3,684
½-pound flat....do	.....	.....	335	1,882	.....	.....	.....	.....	335	1,882
Shad roe: ½-pound flat....do	.....	.....	46	460	.....	.....	.....	.....	46	460
Steelhead trout:										
½-pound tall....do	.....	.....	6,682	39,792	.....	.....	1,698	11,500	8,380	51,292
1-pound flat....do	.....	.....	.....	.....	.....	.....	500	4,000	500	4,000
½-pound flat....do	.....	.....	494	3,177	.....	.....	896	6,391	1,390	9,568
Clams:										
No. 1, whole....do	264	1,046	.....	.....	1,057	4,306	.....	.....	1,321	5,352
No. 1, minced....do	1,632	6,528	.....	.....	16,375	76,407	2,662	9,180	20,669	92,115
No. 2, whole....do	2,450	6,615	.....	.....	.....	.....	.....	.....	2,450	6,615
No. 2, minced....do	4,249	12,322	.....	.....	1,672	12,100	168	504	6,089	24,926
Halves, minced....do	50	220	.....	.....	18,414	80,747	188	564	18,652	81,531

[a] All products except clams and clam juice, which have no uniform weight, represent 48 pounds to the case.

[b] Includes 553 cases smoked before canning.

[c] Includes 656 cases smoked before canning.

EXTENT OF THE CANNING INDUSTRY OF WASHINGTON IN 1915, BY DISTRICTS—Continued.

Items.	Puget Sound.		Columbia River.		Grays Harbor.		Willapa Harbor.		Total.	
Clams—Continued.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Nuuber.*	*Value.*	*Number.*	*Value.*
Quarters, minced ..... cases	.....	.....	.....	.....	156	$468	.....	.....	156	$468
No. 10, whole (not cooked) ..... gallons	6,012	$3,506	.....	.....	1,494	560	.....	.....	7,506	4,066
Clam juice:										
No. 1 ..... cases	30	104	.....	.....	.....	.....	.....	.....	30	104
No. 2 ..... do	75	187	.....	.....	165	759	.....	.....	240	946
No. 10 (not cooked) ..... gallons	1,200	400	.....	.....	3,744	2,027	.....	.....	4,944	2,427
Oysters (not cooked) ..... do	49,103	120,513	.....	.....	.....	.....	.....	.....	49,103	120,513
Oyster cocktails (not cooked) ..... 4-ounce bottles	2,184	212	.....	.....	.....	.....	.....	.....	2,184	212
Shrimp cocktails ..... do	2,196	213	.....	.....	.....	.....	.....	.....	2,196	213

FISHERIES OF OREGON.

While not the least of the three States on the Pacific coast in point of area, Oregon presents the shortest water front and ranks third in the extent of its fisheries.

The number of persons employed in the fisheries and fishery industries of Oregon during the year 1915 was 5,900; of these 23 were engaged on fishing vessels of 5 tons net or more; 60 on vessels engaged in transporting fish and fishery products; 4,472 in the shore, or boat, fisheries; and 1,345 on shore, in canneries, fish houses, etc.

The investment in the fishery industries during the year was $4,064,151, of which $25,935 was credited to 5 fishing vessels; $96,034, to 30 transporting vessels; $582,485 to 1,382 gasoline boats; $69,805 to 1,264 other small boats of various descriptions; $757,170, to all apparatus used in the fisheries of the State; $2,083,913, to shore and accessory property; and $448,809, to working cash capital.

The products of the fisheries of the State in 1915 amounted to 34,692,863 pounds, valued at $1,479,021. The various regions contributing to this total are, in the order of their importance, as follows: Columbia River district, 27,879,438 pounds, valued at $1,271,357; Rogue River, 1,133,331 pounds, valued at $66,298; Pacific Ocean, 596,059 pounds, valued at $30,415; Tillamook Bay, 1,191,488 pounds, valued at $24,516; Nehalem River, 893,630 pounds, valued at $17,493; Umpqua River, 669,663 pounds, valued at $12,425; Coquille River, 549,804 pounds, valued at $10,914; Siletz River, 310,454 pounds, valued at $9,994; Coos Bay, 348,881 pounds, valued at $8,411; Nestucca River, 353,059 pounds, valued at $8,207; Alsea Bay, 391,562 pounds, valued at $7,346; Yaquina Bay, 169,560 pounds, valued at $6,071; Siuslaw River, 117,526 pounds, valued at $2,530; Chetco River, 43,130, pounds, valued at $2,149; and Necanicum River, 45,278 pounds, valued at $895.

The Columbia River catch is so far in excess of all the other regions combined as to render it worthy of special mention. The catch in that river in 1915 amounted to 27,879,438 pounds, valued at $1,271,357. Of this quantity 27,036,808 pounds, valued at $1,239,001, over 96 per cent of the total, were salmon, and the greater part of these, or 20,454,002 pounds, valued at $1,091,156, were chinook salmon. The remainder of the salmon catch was blueback, chum, silver, and steelhead. Humpback salmon are rarely seen this far south. Columbia River has what is known as a "spring" run and a "fall" run of salmon, though the interval between the two seasons is very limited, the closed period extending only from August 25 to September 10. The spring run of chinook was better in 1915 than for several years, and the fall run was very good for the first week or two after the opening of the season, but after that it seemed to diminish. The bluebacks, which accompany the spring run of chinooks, were so few in 1915 as to be almost a failure; they seem to have been very scarce for two years. The chum salmon, which run from about the middle of August until late in November, show a fairly good catch for the year under consideration. The silver salmon usually appear about midsummer and continue until some time in November; the catch of silvers was not so good as in past years. The run of steelhead was about normal.

Commercial fishing in this river covers a distance of 200 mile more from the mouth of the river to Celilo Falls, in Wasco Cou but the major portion of the work is done within 40 or 50 mile the mouth and chiefly with gill nets. Important seine fishe are located on the sand bars near Astoria, these grounds being lea from the Government. Comparativly little pound-net fishing is d on the Oregon side of the river, this method being used princip on the Washington side in a widened portion of the river known Bakers Bay, located just within the mouth of the river. Fish wh are of both the scow and stationary type and are located at vari points on the upper river above the mouth of the Willamette Ri

Considered as a whole, the 1915 pack was slightly above the norm but the fall pack was light, due to the fact, above stated, that the run of chinook salmon dropped off early.

Considerable quantities of salmon have been mild cured on as well as other rivers of Oregon in the past years, mostly for exp to the German trade, but this demand has decreased to such extent since the beginning of the European war that the outpu this product has suffered a marked decline. The loss of the fore trade, however, has been partly offset by an increased dome demand, and it is believed that with proper effort this business be made independent of the export trade.

During the last year or two a very important troll-line fishery been established by the fishermen of Columbia River. This w is carried on chiefly during the interval between the spring and seasons, when gill-net fishing is prohibited, though some follow prior and subsequent to that period. The boats are of an especia good type, propelled by gasoline engines of sufficient power to ena them to go out in very rough seas; the fishing is done in the oc about 5 or 6 miles from the mouth of Columbia River and sometin down as far as Tillamook Head. One boat will sometimes fish many as five to seven lines, fixed on outriggers. The troll-line ca is practically all chinook salmon.

The statistics as to number of persons employed, investment, a products of the fisheries of Oregon in 1915 are given in the tal page 51. The yield of the fisheries of the coastal waters of State is given in the following table:

YIELD OF THE FISHERIES OF THE COASTAL WATERS OF OREGON IN 1915.

Species.	Columbia River.		Necanicum River.		Nehalem River.		Tillamook Bay.		Nestucca River.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
rp	50,000	$750								
mon:										
Blueback	337,027	16,848								
Chinook	20,454,002	1,091,156			371,024	$9,212	479,923	$11,988	161,901	$4,047
Chum	1,454,024	8,391	3,220	$45	176,330	883	290,230	1,454		
Silver	2,500,766	50,248	42,058	850	322,632	6,453	347,514	6,953	174,268	3,485
ad	488,625	4,945								
elhead trout	2,290,989	72,358			23,644	945	5,261	211	16,890	675
rgeon	97,785	5,014								
mcod	22,500	900								
ms, soft							16,560	2,285		
bs							52,000	1,625		
wfish	183,720	20,747								
Total	27,879,438	1,271,357	45,278	895	893,630	17,493	1,191,488	24,516	353,059	8,207

Species.	Siletz River.		Yaquina Bay.		Alsea Bay.		Siuslaw River.		Umpqua River.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
unders			1,965	$40						
rring			10,500	263						
rch			11,930	360						
mon:										
Chinook	167,064	$8,197	44,328	1,601	206,615	$4,124	33,180	$829	112,923	$2,265
Chum	36,720	185			16,225	83			5,130	40
Silver	106,670	1,612	43,420	1,085	99,960	1,500	83,306	1,670	548,610	10,000
elts			3,500	175						
elhead trout					1,200	48	1,040	31	3,000	120
ms, soft			330	49	430	64				
sters, native, mar-										
et			1,547	725						
bs			52,040	1,773	67,132	1,527				
Total	310,454	9,994	169,560	6,071	391,562	7,346	117,526	2,530	669,663	12,425

Species.	Coos Bay.		Coquille River.		Rogue River.		Chetco River.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
rp									50,000	$750
unders									1,965	40
rring									10,500	263
rch									11,930	360
mon:										
Blueback									337,027	16,848
Chinook	132,177	$3,304	207,138	$5,467	1,081,457	$65,001	30,560	$1,833	23,482,292	1,209,024
Chum									1,981,879	11,081
Silver	181,450	3,629	330,046	5,049	51,874	1,297	12,270	306	4,844,844	94,137
ad									488,625	4,945
elts									3,500	175
elhead trout	10,914	435	12,620	398			300	10	2,365,858	75,231
rgeon									97,785	5,014
mcod									22,500	900
ms, soft	5,140	643							22,460	3,041
sters, native, mar-										
et									1,547	725
bs	19,200	400							190,372	5,325
wfish									183,720	20,747
Total	348,881	8,411	549,804	10,914	1,133,331	66,298	43,130	2,149	34,096,804	1,448,606

FISHERIES BY COUNTIES.

The commercial fisheries of Oregon were prosecuted in 15 counties uring the year 1915. This number includes every county on Colum- a River from the mouth up to and including Wasco County at ilo Falls, several counties on Willamette River, a tributary of lumbia River, every county on the coast, and also Josephine County, nich, though located inland, has a run of salmon in Rogue River

which passes through the county en route to the ocean. In consid ing the fisheries of the various counties they will be taken up acco ing to their rank as regards the value of the catch.

Clatsop County.—This county, with its extensive salmon-canni industry, located at Astoria, ranks far above any other in the Sta The catch for the year was 22,676,724 pounds, valued at $1,039,9 The great bulk of this catch was salmon, with chinook far in exc of the others; the catch of chinook was 16,167,867 pounds, valued $886,585. Next to the salmon, the most important catch was raz clams, of which 77,200 pounds, valued at $10,900, were taken on t coast. The fisheries here support five canneries, all located at As ria, on Columbia River; four of them also canned small quantiti of shad and shad roe in 1915.

Several of the firms also froze small quantities of salmon, sha shad roe, and sturgeon. Six clam canneries were operated on t ocean side of this county in 1915, but the pack was not up to norm because the clams seem to have been on the decrease for seve years. One of the canneries also packed a very small lot of salmo Considerable crab fishing has been done from Astoria during the l few years. The greater part of this work is done from January June, and during the early part of this period it is frequently t rough for the boats to reach the crab-fishing grounds, which are lo ted principally beyond the Columbia River bar at the mouth of t river; they often go as far as 15 to 20 miles when crab fishing. B for this obstacle greater effort would undoubtedly have been ma in this line. The crabs are taken with a sort of dip net or hoop n made of cotton twine, hung on iron hoops, two hoops to each n placed one above the other, about a foot apart; the nets are su and buoyed so that they may be located easily.

The most important form of apparatus in Clatsop County is t gill net, the catch of which was 14,607,184 pounds, valued at $641,04 the great bulk of this was salmon, with small quantities of shad a sturgeon. Seines occupy the next place in point of importance, t catch with these being 6,024,288 pounds, valued at $302,764. T line and pound-net fisheries also add considerable quantities to t salmon catch of this county.

The investment of Clatsop County was $2,076,577, an amou greater than that of all the other counties combined.

Columbia County.—This county ranked second in the value of t catch, but the amount invested was less than in some other counti This is probably due to the fact that some of the other counties ha canneries, and these buildings add considerably to the investme while Columbia County has no canneries or fish houses of any kir except a small wholesale fresh-fish house at Rainier. Practically the fish caught by the fishermen of this county are sold to the cann ies at Astoria. The catch amounted to 2,711,569 pounds, valu at $114,911. The investment for the year was $176,162, this amou consisting chiefly of the value of gasoline boats and gill nets.

This county adjoins Clatsop County and borders on that part of t Columbia River where the fishing grounds are especially prolific, a as in the latter county, owes its importance principally to the gill-n fisheries, the catch by these nets being 2,317,982 pounds, valued $83,179. Of this amount 1,835,441 pounds, valued at $76,1 represent chinook salmon alone, the remainder being made up

her salmon and small quantities of shad and sturgeon. The pound-
t catch of this county consisted entirely of salmon. The seine
tch ranked next to that of the pound nets and was made up of sal-
on and carp. The only carp fishery in the State during 1915 was
cated in this county on Willamette River Slough. The catch of
rp amounted to 50,000 pounds, valued at $750, and a part of it
as sent to New York. These fishes are said to be very plentiful in
is section, but there is very little demand for them. Some crawfish
e also taken from this slough, though this fishery has suffered a
crease during the last year or two.

Curry County.—The total catch of the fisheries of this county during
15 was 1,086,283 pounds, valued at $63,035, this being the third
unty in point of importance. This position is due to the fact that
ogue River, which produces the great bulk of the catch, has both
spring and fall run of salmon. Small catches are also taken from
hetco River, but this stream is comparatively unimportant. Rogue
iver flows from Crater Lake in the western part of Klamath County,
tirely through Jackson and Josephine Counties, and enters Curry
unty at the northeastern corner, flowing in a southwesterly direc-
on through the center of the county to the ocean, and, with the ex-
ption of Columbia River, is the longest stream which we have to
nsider. Commercial fishing extends from the mouth up to Grants
ss, located in Josephine County. The fishermen on the lower
ver are handicapped because of the lack of shipping facilities and
e compelled to depend entirely on vessels; the two canneries located
st within the mouth of the river get practically the entire catch of
e lower-river fishermen, but those fishing the upper reaches in
sephine County have access to the railroad at Grants Pass and
nsiderable quantities go from that point in the fresh state. The
tch of the county consisted entirely of salmon, all of which were taken
ith gill nets and seines, the gill-net catch being 660,523 pounds,
lued at $38,992, and the seine catch, 425,760 pounds, valued at
4,043. The Chetco River catch usually goes to a small cannery
cated in northern California, as this is more accessible than the plants
Oregon. The investment in the fisheries of Curry County during
e year was $111,891. In addition to canned salmon this county
oduced a small quantity of mild-cured chinook.

Multnomah County.—This county, with a catch of 1,165,488
unds, valued at $62,232, ranked fourth in the value of its fisheries
d presents a variety of fish exceeded only by Clatsop and Lincoln
unties, although it is located a considerable distance up Columbia
iver. Several fishing vessels operated by a firm located in Port-
nd added a number of species to the list, as cod, halibut, sablefish, and
ckfish, all of which were taken by lines. The chief form of ap-
ratus used by the fishermen of this county was the gill net, with a
tch of 746,724 pounds, valued at $36,577, consisting mostly of
inook salmon. The catch of crawfish, amounting to 95,000
unds, valued at $10,735, was the next in importance. These fishes
ere taken in small traps similar in construction to an eelpot. The
heel fisheries of this county have been quite important in past
ears, though the catch was rather light in 1915; the 18 wheels
wned in the county, valued at $64,800, show a catch of only 161,411
unds, valued at $7,543.

The investment during the year was $870,944; this is excee only by Clatsop County, and the large amount is invested chi in the buildings used in the wholesale fishery trade, the cann located on the Willamette River in Portland, and three canne on the Columbia River side of the county. The amount inves in fishing apparatus is comparatively small. This county has q important seine fisheries on Columbia River, but the catch in year under consideration was negligible. One of the canneries the Columbia packed some shad and shad roe, and some saln was mild cured, salted, and smoked in Portland.

Tillamook County.—Although this county has three bodies of wa in which commercial fisheries are prosecuted, the catch during 1 was sufficient to give it only fifth place in the value of its fish products as compared with other counties. The catch amoun to 2,438,177 pounds, valued at $50,216, and was made up chiefly chinook salmon, the bulk of which were taken in gill nets. The of chum and silver salmon was also very good in this cou Tillamook Bay is the most productive body of water in the cou having a catch of 1,191,488 pounds, valued at $24,516; this ca consisted of salmon, soft clams, and crabs, the bulk of it being mon. Two salmon canneries are located at Bay City and one Tillamook; a small clam cannery has recently been established the latter place and handles practically all the clams taken at t point. There is also a mild-curing establishment at Bay C Nehalem River is the second in importance in the county; catch was entirely salmon and amounted to 893,630 pounds, val at $17,492. It is practically all handled at the two canneries the river at Wheeler and Nehalem. One plant put up a sm quantity of mild-cured chinook salmon. The remaining cannery this county is located on Nestucca River, where the catch is wh salmon and amounted to 353,059 pounds, valued at $8,207, in 19 The fishing on this, as well as Nehalem River, is all done with nets. One of the plants on the Nestucca put up a very small lo mild-cured chinook salmon.

Although Tillamook County has six salmon canneries and clam cannery, the investment is comparatively small, because buildings are inexpensive, the total investment for the year be $269,938.

Wasco County.—This county, though located a considera distance up the Columbia River, occupies a prominent posit among the fishing counties of the State. It ranked sixth in the va of its fisheries and supports quite an important salmon canne The catch amounted to 973,475 pounds, valued at $44,757, mos salmon, with chinooks predominating. Of this catch 838, pounds, valued at $40,871, which is 86 per cent of the total quanti were taken in fish wheels, 9 of which, valued at $43,000, were op ated by the fishermen of this county. In addition to salmon, wheels took a small quantity of sturgeon. The seine fishing this county is comparatively light and the gill-net fishing is negligi

As previously stated, commercial fishing on the Oregon side Columbia River does not extend above Celilo Falls, which is loca in this county. Some of the fish wheels are located here, and catch is usually very good. A considerable number of salmon caught by the Indians, who stand on the rocks at the falls and sp

he fish en route up the river for spawning. The Indians become very expert at this work, and many of them secure a sufficient supply of fish to last them through the winter. The fish are hung in the open and cured by the simple process of drying. The preservation of fish thus cured by the Indians is generally assured, and is said to be superior to any dried fish produced by the white man. The greater part of the salmon taken by the fishermen of this county were canned, and a small lot was mild-cured. The investment of the county for the year was $139,125, the value of the cannery and the value of the wheels making up the major portion of the amount.

Clackamas County.—This county, located on Willamette River, had a catch of 397,398 pounds, valued at $26,744, during the year 1915. Although it is located quite a distance inland and supports no canneries or wholesale fish houses, it ranked seventh among the fishery counties of the State, which is due to the very extensive run of salmon in Willamette River. The greater part of the salmon are taken with gill nets, but a considerable number are taken by trolling below the falls at Oregon City. This is a comparatively recent industry, having been established only about six years ago. It is said that hundreds of small rowboats may be seen some days during the season, a considerable number of them being sportsmen coming from Portland and other points along the river for a day's outing. The law permits them to take only three fish to a man during one day, and the fish are so numerous that it is very easy to secure this number. The trolling season is in the spring, beginning early in March and continuing until early May, when the gill-net season is on. The catch, however, is negligible prior to April, and the fish do not seem to "strike" well after the first week in May. Practically no fishing is done above the falls, although some fish go over the fishway located there. The line catch is all chinook salmon. Some few silver and steelhead are found in this river in the fall, but only a very small catch of the latter is reported for the year, these being taken in gill nets. The sportsmen sometimes catch a few steelhead by line fishing in the fall. The only other species taken in this county is the crawfish; some of these are taken in Tualatin River, a small stream tributary to the Willamette River. The investment of the county for the year was $10,456. About 50 per cent of the gill-net catch is taken to Columbia River canneries by run boats, and the remainder goes to the wholesale fish trade in Portland. A considerable part of the line catch also goes to Portland.

Lincoln County.—The commercial fisheries of this county are supported by three waters, Alsea Bay, Siletz River, and Yaquina Bay. The total catch amounted to 931,931 pounds, valued at $25,496, this value giving it eighth place among the fishing counties of the State. The Alsea Bay catch was 391,562 pounds, valued at $7,346. The great bulk of this was salmon, taken in gill nets, and practically all handled at the two canneries at Lutgens and Waldport, one of which also packed some of the crabs caught here. The Siletz River catch amounted to 310,454 pounds, valued at $9,994, and consisted wholly of salmon, the greater part of which was taken with gill nets and a small portion with seines. Practically all of this salmon is handled at the cannery located at Taft, near the mouth of the river. The fisheries of Yaquina Bay region present a greater variety than the

other sections of the county. The total for this region amou to 169,560 pounds, valued at $6,071, and, in addition to sal included soft clams and crabs and small quantities of floun herring, perch, smelt, and oysters, this being the only place in State where the last-named five species are taken commercially. output of oysters, which were all native, market stock, was 221 bushels, with a value of $725. Attempts have been mad cultivate the eastern oyster in this bay, but the results were ra discouraging. The fishermen of this region are fortunate in ha good shipping facilities to Portland and other inland cities, practically the entire catch is sent out by rail.

This is one of the three counties of the State maintaining fis vessels, although only two of these were operated in 1915, catch consisting of halibut and "lingcod." The investment o county amounted to $141,553.

Coos County.—The fishery products of this county during amounted to 936,445 pounds, valued at $21,408; thus it ranked n in the value of the catch. The bulk of this was salmon taken by nets, the quantity being 684,439 pounds, valued at $14,519; 189 pounds of salmon, valued at $3,763, were taken by seines. fisheries of the county are located on Coos Bay and Coquille R One salmon cannery is located on the bay at Marshfield, and addition to the canning, it also prepared a small quantity of n cured salmon. Some soft clams and crabs are also taken in region. Several small boats from Coos Bay were engaged in o fishing with trawl lines for halibut, rockfishes, "lingcod," and bass, but this fishery was not extensive. Only gill nets and se are used on Coquille River, and the catch was wholly salmon, w were packed at the canneries located at Prosper and Bandon, on each place. This region is without railroad service and is there handicapped in regard to shipping facilities, depending entirely vessels. The investment of Coos County during the year $116,227.

Hood River County.—This county is located quite a distance Columbia River, between Multnomah and Wasco Counties, and its importance as a fishing center to the seine fishery located Cascade Locks. It ranked tenth among the counties in the valu the fisheries for the year; the total catch amounted to 459,046 pou valued at $20,311, all salmon with the exception of 1,500 pound sturgeon, valued at $50. The seine catch amounted to 422 pounds, valued at $18,501, which was nearly 92 per cent of the t catch for the county. Some gill nets are fished in this county, this apparatus is of minor importance. This county has no canne or fish houses, and the salmon are sold to canneries located in o counties on the river. The investment of this county for the was $5,070.

Douglas County.—This county, although the sixth largest in State, has less than 20 miles of coast line, but the largest rive the State, with the exception of Columbia River, is located enti within its confines. This river, the Umpqua, is formed by the ju tion of the north and south forks near Roseburg and is the only w in the county furnishing commercial fishing. The entire catch salmon, taken in gill nets, and amounted to 669,663 pounds, val

at $12,425. Two salmon canneries were operated on the Umpqua River in 1915, one at Gardiner and the other at Reedsport, and these handled practically all the salmon taken from the river; only a few tierces being mild cured. The investment during the year was $93,444.

Washington County.—This county ranked twelfth in the value of its fisheries in 1915. The total catch was 48,420 pounds, valued at $5,474, and consisted entirely of crawfish, all of which were taken in traps fished in Tualatin River, which is a branch of the Willamette River. The traps are very similar to an eelpot; they are made of cotton twine, about 1½-inch mesh, covering a small, round iron frame. The demand for crawfish is said to have decreased considerably since the prohibition law went into effect, as most of them were handled by the saloon trade. The season is from March 1 to November 1, and the best catches are made during June and again in September and October. The crawfish buries itself in the mud during the winter. The investment in this county was only $640, the least, with one exception, in the State.

Josephine County.—This is the only county in the State not bordering on the productive waters of Columbia River or on the coast that supports commercial fisheries. It owes its place among the fishing counties to the fact that Rogue River passes entirely through it before entering Curry County. The fishing extends up as far as Grants Pass, near the eastern border of Josephine County, and a considerable part of the catch of the county is shipped by rail from that point in the fresh state. The catch was all salmon, amounted to 90,178 pounds, valued at $5,412, and was all taken in gill nets. The investment was all in gill nets and boats and amounted to $3,278.

Lane County.—This county has considerable area, but, like Douglas County, has a very short coast line, and the catch of fish is comparatively small. It was all taken from Siuslaw River and amounted to 117,526 pounds, valued at $2,530. The only form of apparatus used was gill nets. One cannery, located at Florence on the Siuslaw, handles practically all the salmon. The investment of $48,590 was mostly in the cannery building.

Yamhill County.—The output of this county was the least of all the fishing counties of the State. The product consisted entirely of crawfish, amounting to 5,300 pounds, valued at $588. All were taken from Yamhill River, tributary to the Willamette, in traps similar to those noted under Washington County. The investment for the county was only $256.

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF ORE IN 1915, BY COUNTIES.

	Clackamas.		Clatsop.		Columbia.		Coos.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	V
On vessels fishing			3					
On vessels transporting			34		2		4	
In shore fisheries	120		2,393		271		288	
On shore, in canneries, etc.			680		20		86	
Total	120		3,110		293		378	
INVESTMENT.								
Vessels fishing			1	$5,000				
Tonnage			18					
Outfit				300				
Vessels transporting			17	51,300	1	$4,000	2	
Tonnage			152		10		21	
Outfit				7,600		300		
Boats:								
Gasoline			843	396,900	221	77,700	53	
Sail, row, etc.	104	$3,600	220	22,695	74	18,705	119	
Apparatus, vessel fisheries:								
Lines				90				
Apparatus, shore fisheries:								
Seines			43	23,500	5	1,150	8	
Length in yards			21,430		1,100		2,460	
Gill nets	210	5,950	1,605	389,325	238	55,600	195	
Length in yards	13,900		750,490		86,020		25,000	
Pound nets			28	19,600	8	2,300		
Hoop nets			620	905			60	
Pots and traps	240	156	8	160	780	507		
Lines		250		1,000				
Tongs, hoes, etc.				320				
Shore and accessory property		500		1,020,082		7,900		
Cash capital				137,800		8,000		
Total		10,456		2,076,577		176,162		1
PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	V
Carp					50,000	$750		
Halibut			98,000	$2,940			10,000	
Herring			2,000	120				
"Lingcod"			6,000	75			5,000	
Rockfishes			5,000	125			6,000	
Salmon:								
Blueback			150,447	7,522	7,577	378		
Chinook	390,420	$26,125	16,167,867	886,585	2,073,921	102,727	354,075	
Chum			1,150,965	6,832	306,279	1,604		
Silver			2,391,953	47,811	67,485	1,355	511,496	
Sea bass							2,000	
Shad			446,093	4,512	32,385	331		
Steelhead trout	1,978	59	1,858,510	59,507	136,007	3,979	23,534	
Sturgeon			75,289	3,696	7,915	397		
Tomcod			22,500	900				
Clams:								
Soft							5,140	
Razor			77,200	10,900				
Crabs			224,900	8,430			19,200	
Crawfish	5,000	560			30,000	3,390		
Total	397,398	26,744	22,676,724	1,039,955	2,711,569	114,911	936,445	

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF OREGON IN 1915, BY COUNTIES—Continued.

	Curry.		Douglas.		Hood River.		Josephine.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels transporting			2					
In shore fisheries	163		159		31		22	
On shore, in canneries, etc.	62		52		2			
Total	225		213		33		22	
INVESTMENT.								
Vessels transporting			1	$2,000				
Tonnage			7					
Outfit				400				
Boats:								
Gasoline	5	$1,700	36	9,300	4	$1,500		
Sail, row, etc.	82	2,557	75	1,875	14	1,420	22	$638
Apparatus, shore fisheries:								
Seines	6	2,900			2	600		
Length in yards	2,100				1,000			
Gill nets	159	8,680	276	13,070	23	1,550	22	2,640
Length in yards	15,310		28,140		2,720		5,500	
Shore and accessory property		68,054		51,799				
Cash capital		28,000		15,000				
Total		111,891		93,444		5,070		3,278
PRODUCTS.								
Salmon:	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Blueback					6,760	$338		
Chinook	1,021,839	$61,422	112,923	$2,265	324,780	$16,279	90,178	$5,412
Chum			5,130	40				
Silver	64,144	1,603	548,610	10,000	13,614	273		
Steelhead trout	300	10	3,000	120	112,392	3,371		
Sturgeon					1,500	50		
Total	1,086,283	63,035	669,663	12,425	459,046	20,311	90,178	5,412

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF OR IN 1915, BY COUNTIES—Continued.

	Lane.		Lincoln.		Multnomah.		Tillamoo	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	
On vessels fishing			5		15			
On vessels transporting	2				16			
In shore fisheries	107		342		154		339	
On shore, in canneries, etc.	24		73		168		128	
Total	133		420		353		467	
INVESTMENT.								
Vessels fishing			2	$3,200	2	$14,450		
Tonnage			22		34			
Outfit				485		2,500		
Vessels transporting	1	$2,000			8	18,384		
Tonnage	12				65			
Outfit		200				2,950		
Boats:								
Gasoline	16	2,400	10	4,935	110	42,750	81	
Sail, row, etc.	33	990	242	6,630	43	1,235	204	
Apparatus, vessel fisheries:								
Lines				255		660		
Apparatus, shore fisheries:								
Seines			4	550	2	1,500	2	
Length in yards			640		500		360	
Gill nets	142	5,500	318	23,240	138	32,600	542	
Length in yards	11,000		47,530		48,320		59,640	
Pound nets					1	200		
Pots and traps			1,800	1,800	1,860	1,209	240	
Wheels					18	64,800		
Lines				68				
Tongs, hoes, etc				180				
Shore and accessory property		27,500		62,710		569,397		1
Cash capital		10,000		37,500		118,309		
Total		48,590		141,553		870,944		2
PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	
Cod					14,400	$288		
Flounders			1,965	$40				
Halibut			58,485	$2,056	68,684	3,434		
Herring			10,500	263				
"Lingcod"			1,870	29				
Perch			11,930	360				
Rockfishes					1,000	20		
Sablefish					15,520	388		
Salmon:								
Blueback					105,443	5,270		
Chinook	33,180	$829	418,007	13,922	764,834	38,826	1,012,848	$
Chum			52,945	268			466,560	
Silver	83,306	1,670	250,050	4,197	3,792	78	844,414	
Shad					10,147	102		
Smelt			3,500	175				
Steelhead trout	1,040	31	1,200	48	77,442	2,558	45,795	
Sturgeon					9,226	533		
Clams: Soft			760	113			16,560	
Oysters, native, market			1,547	725				
Crabs			119,172	3,300			52,000	
Crawfish					95,000	10,735		
Total	117,526	2,530	931,931	25,496	1,165,488	62,232	2,438,177	

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF OREGON IN 1915, BY COUNTIES—Continued.

	Wasco.		Washington		Yamhill		Total.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels fishing							23	
On vessels transporting							60	
In shore fisheries	69		10		4		4,472	
On shore, in canneries, etc.	50						1,345	
Total	119		10		4		5,900	
INVESTMENT.								
Vessels fishing							5	$22,650
Tonnage							74	
Outfit								3,285
Vessels transporting							30	84,184
Tonnage							267	
Outfit								11,850
Boats:								
Gasoline	3	$2,300					1,382	582,485
Sail, row, etc.	18	840	10	$250	4	$100	1,264	69,805
Apparatus, vessel fisheries:								
Lines								1,005
Apparatus, shore fisheries:								
Seines	3	900					75	35,125
Length in yards	1,500						31,090	
Gill nets	9	385					3,877	582,740
Length in yards	720						1,094,290	
Pound nets	2	600					39	22,700
Hoop nets							680	995
Pots and traps			600	390	240	156	5,768	4,828
Wheels	9	43,000					27	107,800
Lines								1,438
Tongs, hoes, etc								539
Shore and accessory property		70,400						2,083,913
Cash capital		20,700						448,809
Total		139,125		640		256		4,064,151
PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Carp							50,000	$750
Cod							14,400	288
Flounders							1,965	40
Halibut							235,169	9,430
Herring							12,500	383
"Lingcod"							12,870	354
Perch							11,930	360
Rockfishes							12,000	445
Sablefish							15,520	388
Salmon:								
Blueback	66,800	$3,340					337,027	16,848
Chinook	732,180	36,614					23,497,052	1,225,393
Chum							1,981,879	11,081
Silver	65,980	1,581					4,844,844	94,140
Sea bass							2,000	60
Shad							488,625	4,945
Smelt							3,500	175
Steelhead trout	104,660	2,884					2,365,858	75,332
Sturgeon	3,855	338					97,785	5,014
Tomcod							22,500	900
Clams:								
Soft							22,460	3,041
Razor							77,200	10,900
Oysters, native, market							1,547	725
Crabs							415,272	13,755
Crawfish			48,420	$5,474	5,300	$588	183,720	20,747
Total	973,475	44,757	48,420	5,474	5,300	588	34,707,623	1,495,494

PRODUCTS BY APPARATUS.

In the vessel fisheries of Oregon the catch was all taken with and amounted to 262,959 pounds, valued at $9,055. In the sho boat fisheries gill nets were the most productive forms of appar the catch amounting to 23,256,052 pounds, valued at $918,946. catch with seines was 7,500,793 pounds, valued at $363,280. Po nets took 1,263,561 pounds, valued at $45,198; lines, 686,500 po valued at $44,060; wheels, 1,000,299 pounds, valued at $48 tongs, hoes, etc., 101,207 pounds, valued at $14,666; pots and t 377,392 pounds, valued at $26,572; and hoop nets, 244,100 po valued at $8,830.

The following tables give statistics by apparatus of the qua and value of fishery products taken in the fisheries of Oregon in

YIELD OF THE VESSEL FISHERIES OF OREGON IN 1915, BY COUNTIES, SPECIES APPARATUS.

Apparatus and species.	Clatsop.		Lincoln.		Multnomah.		Total
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*
Lines:							
Cod					14,400	$288	14,400
Halibut	98,000	$2,940	52,485	$1,756	68,684	3,434	219,169
"Lingcod"	6,000	75	1,870	29			7,870
Rockfishes	5,000	125			1,000	20	6,000
Sablefish					15,520	388	15,520
Total	109,000	3,140	54,355	1,785	99,604	4,130	262,959

STATISTICS OF YIELD IN THE SHORE FISHERIES OF OREGON IN 1915, BY COU SPECIES, AND APPARATUS.

BY SEINES.

Species.	Clatsop.		Columbia.		Coos.		Curry.		Hood
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*
Carp			50,000	$750					
Herring	2,000	$120							
Salmon:									
Blueback	109,645	5,483							2,760
Chinook	4,609,415	264,150	98,460	4,923	60,358	$1,797	382,820	$22,968	295,780
Chum	133,573	672							
Silver	64,810	1,264	11,436	230	129,548	1,966	42,640	1,065	13,614
Shad	227,069	2,277							
Steelhead trout	875,531	28,695					300	10	108,392
Sturgeon	2,245	103							1,500
Total	6,024,288	302,764	159,896	5,903	189,906	3,763	425,760	24,043	422,046

Species.	Lincoln.		Multnomah.		Tillamook.		Wasco.		Total
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*
Carp									50,000
Herring									2,000
Perch	11,930	$360							11,930
Salmon:									
Blueback			4,828	$241					117,233
Chinook	5,200	104	33,461	2,195	79,340	$1,973			5,564,834
Chum					5,580	30			139,153
Silver	1,100	22			26,829	540	50,000	$1,250	339,977
Shad			5,584	56					232,653
Steelhead trout			778	23			50,000	1,250	1,035,001
Sturgeon			3,442	172			825	90	8,012
Total	18,230	486	48,093	2,687	111,749	2,543	100,825	2,590	7,500,793

STATISTICS OF YIELD IN THE SHORE FISHERIES OF OREGON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY GILL NETS.

Species.	Clackamas.		Clatsop.		Columbia.		Coos.		Curry.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value*	*Pounds.*	*Value.*
Salmon:										
Blueback			39,117	$1,954	7,577	$378				
Chinook	322,920	$19,375	10,387,488	558,001	1,835,441	76,154	278,957	$6,974	639,019	$38,454
Chum			865,922	5,028	265,304	1,336				
Silver			2,237,709	44,731	40,061	805	381,948	6,712	21,504	538
Shad			158,805	1,627	32,385	331				
Steelhead trout	1,978	59	845,274	26,119	129,299	3,778	23,534	833		
Sturgeon			72,869	3,581	7,915	397				
Total	324,898	19,434	14,607,184	641,041	2,317,982	83,179	684,439	14,519	660,523	38,992

Species.	Douglas.		Hood River.		Josephine.		Lane.		Lincoln.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Flounders									1,965	$40
Herring									10,500	263
Salmon:										
Blueback			4,000	$200						
Chinook	112,923	$2,265	29,000	1,490	90,178	$5,412	33,180	$829	412,807	13,818
Chum	5,130	40							52,945	268
Silver	548,610	10,000					83,306	1,670	248,950	4,175
Smelt									3,500	175
Steelhead trout	3,000	120	4,000	120			1,040	31	1,200	48
Total	669,663	12,425	37,000	1,810	90,178	5,412	117,526	2,530	731,867	18,787

Species.	Multnomah.		Tillamook.		Wasco.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Flounders							1,965	$40
Herring							10,500	263
Salmon:								
Blueback	36,784	$1,837			800	$40	88,278	4,409
Chinook	665,800	33,250	933,508	$23,274	4,600	235	15,745,821	779,531
Chum			460,980	2,307			1,650,281	8,979
Silver			817,585	16,351	1,600	43	4,381,273	85,025
Shad	3,500	35					194,690	1,993
Smelt							3,500	175
Steelhead trout	37,340	1,280	45,795	1,831	1,500	40	1,003,960	34,259
Sturgeon	3,300	175			1,700	119	85,784	4,272
Total	746,724	36,577	2,257,868	43,763	10,200	477	23,256,052	918,946

BY POUND NETS.

Species.	Clatsop.		Columbia.		Multnomah.		Wasco.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Salmon:										
Blueback	1,685	$85							1,685	$85
Chinook	580,964	29,034	140,020	$5,650	7,300	$365	8,320	$416	736,604	35,465
Chum	151,470	1,132	40,975	268					192,445	1,400
Silver	89,434	1,816	15,988	320	2,892	60	7,132	143	115,446	2,339
Shad	60,219	608							60,219	608
Steelhead trout	137,705	4,693	6,708	201	4,464	135	7,680	230	156,557	5,259
Sturgeon	175	12					430	30	605	42
Total	1,021,652	37,380	203,691	6,439	14,656	560	23,562	819	1,263,561	45,198

BY HOOP NETS.

Species.	Clatsop.		Coos.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Crabs	224,900	$8,430	19,200	$400	244,100	$8,830

STATISTICS OF YIELD IN THE SHORE FISHERIES OF OREGON IN 1915, BY COU SPECIES, AND APPARATUS—Continued.

BY POTS AND TRAPS.

Species.	Clackamas.		Clatsop.		Columbia.		Lincol
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*
Crabs							119,172
Crawfish	5,000	$560			30,000	$3,390	
Tomcod			22,500	$900			
Total	5,000	560	22,500	900	30,000	3,390	119,172

Species.	Multnomah.		Tillamook.		Washington.		Yamhill.		To
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds*
Crabs			52,000	$1,625					171,172
Crawfish	95,000	$10,735			48,420	$5,474	5,300	$588	183,720
Tomcod									22,500
Total	95,000	10,735	52,000	1,625	48,420	5,474	5,300	588	377,392

BY WHEELS.

Species.	Multnomah.		Wasco.		Tota
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*
Salmon:					
Blueback	63,831	$3,192	66,000	$3,300	129,831
Chinook	58,273	3,016	719,260	35,963	777,533
Silver	900	18	7,248	145	8,148
Shad	1,063	11			1,063
Steelhead trout	34,860	1,120	45,480	1,364	80,340
Sturgeon	2,484	186	900	99	3,384
Total	161,411	7,543	838,888	40,871	1,000,299

BY LINES.

Species.	Clackamas.		Clatsop.		Coos.		Lincoln.		To
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds*
Halibut					10,000	$1,000	6,000	$300	16,000
"Lingcod"					5,000	250			5,000
Rockfishes					6,000	300			6,000
Salmon: Chinook	67,500	$6,750	590,000	$35,400					657,500
Sea bass					2,000	60			2,000
Total	67,500	6,750	590,000	35,400	23,000	1,610	6,000	300	686,500

BY TONGS, HOES, ETC.

Species.	Clatsop.		Coos.		Lincoln.		Tillamook.		To
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds*
Clams:									
Razor	77,200	$10,900							77,200
Soft			*5,140	$643	760	$113	16,560	$2,285	22,460
Oysters, native, market					1,547	725			1,547
Total	77,200	10,900	5,140	643	2,307	838	16,560	2,285	101,207

FISHERY INDUSTRIES.

For statistics of the quantity and value of fishery products prepared in Oregon in 1915, exclusive of canning, see table, page 54. The following table contains statistics of the extent of the canning industry of the State, by districts, in 1915:

EXTENT OF THE CANNING INDUSTRY OF OREGON IN 1915, BY DISTRICTS.

Items	Columbia River.		Pacific coast.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.
Establishments	10	$772,235	24	$336,131	34	$1,108,366
Cash capital	.....	180,309	.....	175,300	.....	355,609
Persons engaged	561	.....	467	.....	1,028	.....
Wages paid	.....	283,609	.....	91,830	.....	375,439
PRODUCTS.[a]						
Salmon:						
Blueback—						
1 pound, flat....cases..	11	88	.....	.....	11	88
½ pound, flat....do....	4,499	24,827	.....	.....	4,499	24,827
Chinook—						
1 pound, tall....do....	23,828	155,185	9,908	47,654	33,736	202,839
1 pound, flat....do....	103,108	801,122	18,749	139,289	121,857	940,411
1 pound, oval....do....	2,388	21,496	.....	.....	2,388	21,496
½ pound, flat....do....	125,296	1,024,727	7,959	52,514	133,255	1,077,241
¼ pound, flat....do....	1,529	4,578	.....	.....	1,529	4,578
Chum—						
1 pound, tall....do....	25,158	66,122	8,991	23,170	34,149	89,292
1 pound, flat....do....	2,291	6,558	.....	.....	2,291	6,558
½ pound, flat....do....	4,288	8,848	.....	.....	4,288	8,848
Silver—						
1 pound, tall....do....	11,332	78,530	23,170	101,229	34,502	179,759
1 pound, flat....do....	2,093	14,160	3,949	18,059	6,042	32,219
½ pound, flat....do....	8,652	27,490	4,209	18,570	12,861	46,060
Steelhead—						
1 pound, tall....do....	3,955	20,791	.....	.....	3,955	20,791
1 pound, flat....do....	8,710	56,682	.....	.....	8,710	56,682
½ pound, flat....do....	6,118	35,127	.....	.....	6,118	35,127
Shad:						
1 pound, tall....do....	1,281	3,184	.....	.....	1,281	3,184
½ pound, flat....do....	1,145	3,435	.....	.....	1,145	3,435
Shad roe:						
½ pound, flat....do....	171	1,702	.....	.....	171	1,702
½ pound, oval....do....	93	1,153	.....	.....	93	1,153
Clams:						
No. 1, whole....do....	.....	.....	400	1,760	400	1,760
No. 1, minced....do....	.....	.....	4,574	20,145	4,574	20,145
No. 2, minced....do....	.....	.....	1,320	5,134	1,320	5,134
Halves, minced....do....	.....	.....	3,248	12,660	3,248	12,660
Clam juice: No. 1....do....	.....	.....	225	810	225	810
Crabs: ½ pound, flat....do....	.....	.....	252	3,169	252	3,169

[a] All products except clams and clam juice, which have no uniform weight, represent 48 pounds to the case.

FISHERIES OF CALIFORNIA.

California in 1915 ranked second among the Pacific Coast States in the number of persons engaged, in the value of its investment, and in the amount and value of its fishery products. There were 4,282 persons engaged in the shore fisheries, 551 in the vessel fisheries, 35 in vessels transporting, and 3,584 persons engaged on shore in canneries, etc., making a total of 8,452 persons connected with the fisheries, as compared with 5,530 in 1904. The increase can be traced mainly to the shore industries.

The total investment in the fisheries of the State amounted to $5,824,263, showing an increase of nearly 55 per cent since 1904. The items making up this total are 73 fishing vessels valued, with

STATISTICS OF YIELD IN THE SHORE FISHERIES OF OREGON IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY POTS AND TRAPS.

Species.	Clackamas.		Clatsop.		Columbia.		Lincoln.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Crabs							119,172	$3,
Crawfish	5,000	$560			30,000	$3,390		
Tomcod			22,500	$900				
Total	5,000	560	22,500	900	30,000	3,390	119,172	3,

Species.	Multnomah.		Tillamook.		Washington.		Yamhill.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Crabs			52,000	$1,625					171,172	$4,
Crawfish	95,000	$10,735			48,420	$5,474	5,300	$588	183,720	20,
Tomcod									22,500	
Total	95,000	10,735	52,000	1,625	48,420	5,474	5,300	588	377,392	26,

BY WHEELS.

Species.	Multnomah.		Wasco.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Salmon:						
Blueback	63,831	$3,192	66,000	$3,300	129,831	$6,
Chinook	58,273	3,016	719,260	35,963	777,533	38,
Silver	900	18	7,248	145	8,148	
Shad	1,063	11			1,063	
Steelhead trout	34,860	1,120	45,480	1,364	80,340	2,
Sturgeon	2,484	186	900	99	3,384	
Total	161,411	7,543	838,888	40,871	1,000,299	48,

BY LINES.

Species.	Clackamas.		Clatsop.		Coos.		Lincoln.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Halibut					10,000	$1,000	6,000	$300	16,000	$1,
"Lingcod"					5,000	250			5,000	
Rockfishes					6,000	300			6,000	
Salmon: Chinook	67,500	$6,750	590,000	$35,400					657,500	42,
Sea bass					2,000	60			2,000	
Total	67,500	6,750	590,000	35,400	23,000	1,610	6,000	300	686,500	44,

BY TONGS, HOES, ETC.

Species.	Clatsop.		Coos.		Lincoln.		Tillamook.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Clams:										
Razor	77,200	$10,900							77,200	$10,
Soft			*5,140	$643	760	$113	16,560	$2,285	22,460	3,
Oysters, native, market					1,547	725			1,547	
Total	77,200	10,900	5,140	643	2,307	838	16,560	2,285	101,207	14,

FISHERY INDUSTRIES.

For statistics of the quantity and value of fishery products prepared in Oregon in 1915, exclusive of canning, see table, page 54. The following table contains statistics of the extent of the canning industry of the State, by districts, in 1915:

EXTENT OF THE CANNING INDUSTRY OF OREGON IN 1915, BY DISTRICTS.

Items	Columbia River.		Pacific coast.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.
Establishments	10	$772,235	24	$336,131	34	$1,108,366
Cash capital	.....	180,309	.....	175,300	.....	355,609
Persons engaged	561	.....	467	.....	1,028	.....
Wages paid	.....	283,609	.....	91,830	.....	375,439
PRODUCTS.[a]						
Salmon:						
Blueback—						
1 pound, flat....cases	11	88	.....	.....	11	88
½ pound, flat....do	4,499	24,827	.....	.....	4,499	24,827
Chinook—						
1 pound, tall....do	23,828	155,185	9,908	47,654	33,736	202,839
1 pound, flat....do	103,108	801,122	18,749	139,289	121,857	940,411
1 pound, oval....do	2,388	21,496	.....	.....	2,388	21,496
½ pound, flat....do	125,296	1,024,727	7,959	52,514	133,255	1,077,241
¼ pound, flat....do	1,529	4,578	.....	.....	1,529	4,578
Chum—						
1 pound, tall....do	25,158	66,122	8,991	23,170	34,149	89,292
1 pound, flat....do	2,291	6,558	.....	.....	2,291	6,558
½ pound, flat....do	4,288	8,848	.....	.....	4,288	8,848
Silver—						
1 pound, tall....do	11,332	78,530	23,170	101,229	34,502	179,759
1 pound, flat....do	2,093	14,160	3,949	18,059	6,042	32,219
½ pound, flat....do	8,652	27,490	4,209	18,570	12,861	46,060
Steelhead—						
1 pound, tall....do	3,955	20,791	.....	.....	3,955	20,791
1 pound, flat....do	8,710	56,682	.....	.....	8,710	56,682
½ pound, flat....do	6,118	35,127	.....	.....	6,118	35,127
Shad:						
1 pound, tall....do	1,281	3,184	.....	.....	1,281	3,184
½ pound, flat....do	1,145	3,435	.....	.....	1,145	3,435
Shad roe:						
½ pound, flat....do	171	1,702	.....	.....	171	1,702
½ pound, oval....do	93	1,153	.....	.....	93	1,153
Clams:						
No. 1, whole....do	.....	.....	400	1,760	400	1,760
No. 1, minced....do	.....	.....	4,574	20,145	4,574	20,145
No. 2, minced....do	.....	.....	1,320	5,134	1,320	5,134
Halves, minced....do	.....	.....	3,248	12,660	3,248	12,660
Clam juice: No. 1....do	.....	.....	225	810	225	810
Crabs: ½ pound, flat....do	.....	.....	252	3,169	252	3,169

[a] All products except clams and clam juice, which have no uniform weight, represent 48 pounds to the case.

FISHERIES OF CALIFORNIA.

California in 1915 ranked second among the Pacific Coast States in the number of persons engaged, in the value of its investment, and in the amount and value of its fishery products. There were 4,282 persons engaged in the shore fisheries, 551 in the vessel fisheries, 35 in vessels transporting, and 3,584 persons engaged on shore in canneries, etc., making a total of 8,452 persons connected with the fisheries, as compared with 5,530 in 1904. The increase can be traced mainly to the shore industries.

The total investment in the fisheries of the State amounted to $5,824,263, showing an increase of nearly 55 per cent since 1904. The items making up this total are 73 fishing vessels valued, with

their outfit, at $354,375; 20 transporting vessels with a value, incl ing their outfit, of $72,000; 1,429 gasoline boats valued at $1,351,1 1,169 other boats valued at $104,816; apparatus, in the shore vessel fisheries, valued at $606,944; shore and accessory property w a value of $2,731,390 and working cash capital amounting to $448,8

The products of the fisheries of California in 1915 aggrega 93,338,703 pounds, with a value to the fishermen of $2,506,7 This is an increase of about 44 per cent in quantity, but a decreas about three-fifths of 1 per cent in value as compared with 19 Among the items in the products of special importance may be m tioned 7,303,933 pounds of chinook salmon, valued at $340,9 21,024,190 pounds of albacore, or tuna, valued at $316,103; 6,923, pounds of flounders, valued at $209,766; 375,774 pounds, or 53, bushels, of eastern oysters, valued at $165,573; 4,952,692 pounds salted cod, valued at $161,695; 1,784,488 pounds of striped b valued at $146,928; 4,344,254 pounds of rockfishes, valued $146,216; 892,392 pounds of spiny lobsters, valued at $130,1 1,414,155 pounds of crabs, valued at $128,434; 3,592,646 pounds barracuda, valued at $124,870, and 5,761,929 pounds of sole, val at $108,254.

For statistics as to number of persons engaged, investment, products of the fisheries of California in 1915, see table, page 51.

FISHERIES BY COUNTIES.

San Francisco County.—The fisheries of San Francisco County 1915 were more valuable than those of any other county in the Sta the output amounting to 17,602,489 pounds, valued at $649,8 Among the leading species were codfish, eastern oysters, cra sole, rockfishes, flounders, striped bass, and chinook salmon. codfish, amounting to 4,952,692 pounds, valued at $161,695, w taken by three vessels owned in San Francisco and fishing in Alask waters. Practically all of the fishermen of this county live wit the corporate limits of San Francisco. In 1915, 552 men were engag in the shore fisheries and 116 on vessels of 5 net tons and over. majority of the fishermen, as well as wholesale dealers, are Italia There were 290 gas boats, valued at $259,710; 35 rowboats, valued $705; 68 house boats and scows, valued at $7,600; and 2 sailboa valued at $500, employed in the fisheries of this county. Practica all of these boats were docked at Fishermens Wharf, San Francis the headquarters of the several fishery unions to which the own of the boats belonged.

The fishing from San Francisco is prosecuted both in the ocean a in San Francisco Bay. The trawl-line fishing for rockfishes a other species and the hoop-net fishing for crabs are followed entir in the ocean, while the gill nets are fished both in the ocean and S Francisco Bay, and occasionally fishermen go as far as Suisun B The leading species taken with this apparatus are sea bass, sm shad, chinook salmon, herring and carp. Seines are also fished San Francisco Bay for white bait, anchovies, and sardines. Amo other forms of apparatus used are lampara nets and bag nets, the ca consisting mainly of squid and shrimp. The shrimp are taken mai by Chinese fishermen.

San Francisco is the headquarters of an important oyster fishery prosecuted in San Francisco Bay. This industry, however, has suffered a noticeable decline within recent years. In 1904, the output amounted to 138,667 bushels of eastern oysters, valued at $514,399, and 42,932 bushels of native oysters, valued at $91,770. In 1915 the output had dwindled to 51,556 bushels of eastern oysters, valued at $156,745. No native oysters have been taken from San Francisco Bay for several years, the result being that most of those now consumed have to be brought from Washington, the price being very much greater than formerly, when there was a local supply.

A small quantity of soft clams are taken from the flats of San Francisco Bay near San Francisco by fishermen from that city. In 1915 the output was 2,300 bushels, with a value of $5,300, a decline of 914 bushels since 1904, but an increase in value of $1,550. The clams are handled mostly by Chinese dealers, and many of the fishermen are also Chinese.

Mussels to the amount of 600 bushels, with a value of $1,200, were scraped from the pilings of the city wharves and disposed of for food.

Contra Costa County.—The fishery products of this county in 1915 amounted to 7,395,328 pounds, valued at $229,550. The most important species were chinook salmon, striped bass, and shad. A few other species were taken in small quantities. Most of the fishing was done in Suisun and San Pablo Bays and the Sacramento River. A little fishing was also done in San Francisco Bay and San Joaquin River. With the exception of a few seines used mainly for carp and smelt, gill nets are the only apparatus used in this county. Pittsburg is the most important fishing center, not only in this county, but on the entire Sacramento River. In 1915 a total of 305 fishermen and 5 shoremen were engaged in this town, almost all of whom were Italians. These men employed 100 sailboats, valued at $13,000; 51 gas boats, valued at $29,000; and 8 house boats, worth $1,600. Gill nets were the only form of apparatus used. This town in 1915 was the center of an important canning trade in shad, shad roe, and chinook salmon. In addition, immense quantities of shad were salted and mild cured, and large supplies of chinook salmon were mild cured and pickled. Most of the salted shad were sent to China. During this year the first shipments east of shad in large quantities were begun. They were sent by express in refrigerator cars. The consignments were made in carload lots, and were sent mostly to Chicago and New York. The first large shipments of shad to the east were made in 1914.

One-half or more of the fishermen of this town yearly make a practice of going to Alaska to fish under contract for one of the salmon-canning firms of that territory. They usually leave Pittsburg between April 1 and 15 and remain away about five months. The trip is made on one of the companies' steamers from San Francisco.

Martinez, also in Contra Costa County, has very important gill-net fisheries, the catch in 1915 amounting to 672,000 pounds of striped bass, valued at $57,120; 414,000 pounds of chinook salmon, valued at $21,390; and 153,355 pounds of shad, valued at $2,300. A total of 105 men were engaged in fishing and 7 in transporting fish. These men employed 22 gas boats, valued at $10,200; 34

sailboats, valued at $5,000; and 7 house boats, worth $1,400. branch of a firm in Pittsburg salted large quantities of shad here.

Solano County.—There are several important fishing localit in this county, the most important of which is Rio Vista. The grea part of the fishing is done in the Sacramento River, but a consid able amount is also done in San Pablo and Suisun Bays and S Joaquin River. The catch consists mainly of chinook salmon a striped bass. Large quantities of shad are taken, but the price too low to afford much profit. Gill nets are the only form of appara used in the county. One cannery at Benicia and a mild-curi establishment at South Vallejo utilized large quantities of chino salmon. Most of the catch, however, as in Contra Costa Coun was handled by local buy boats working on commission for San Fr cisco firms.

Marin County.—Considering the extent of its fisheries as compar with some of the more important counties, the variety of fishe products in this county is rather noticeable. The greater part of t fishing is done in Tomales Bay, but some of the fishermen along th bay also fish in the ocean. Many kinds of apparatus are used, b the most important forms are seines and gill nets. The leadi species taken with seines are surf fish, herring, and perch, and with g nets sea bass, smelt, and striped bass. Considerable quantities clams are taken in Tomales Bay, but the industry is far less imp tant than that of the oyster, which has been developing to some exte during the past few years through private planting. The cultivati of clams on private beds has also been undertaken recently. Tomales Bay is comparatively free from impurities, it is thought th both the oyster and clam industries should improve with attentio A few men were engaged for a short time in 1915 in taking abalo the resultant products consisting of $450 worth of shells, $158 wo of abalone meat, and $40 worth of pearls.

Sausalito is situated on Richardson Bay, but its leading fishery i dustry is that for crabs, conducted in the Pacific Ocean. The outp in 1915 amounted to 163,800 pounds, valued at $16,134.

San Joaquin County.—The total output of the fisheries of th county in 1915 amounted to 1,330,674 pounds, valued at $44,23 showing an increase since 1904 of 803,853 pounds in quantity a $21,960 in value. Catfish was the leading species, two-thirds of t State's catch being credited to this county. They were taken in t San Joaquin River in fyke nets and seines, but mainly in the form Next in importance to the catfish is the chinook salmon. Sh exceed all other species in abundance, but its importance is mu lessened by the low price received by the fishermen. More than o and a quarter million pounds of this species were salted at differe points in the county during the year, many of the fish coming fro points outside of the county. Of the firms engaged in salting, o was American and the other two Chinese. Practically all of the salt shad were shipped to China. Stockton is the center of the wholesa trade of the county.

Humboldt County.—The output of the fisheries of this county 1915 amounted to 829,630 pounds, valued at $32,796, more than on half of the value being credited to chinook salmon. Among other sp cies worthy of mention are silver salmon, flounders, smelt, steelhe trout, soft clams, and crabs. This county borders on the Pacific Ocea

but its most important fisheries are those prosecuted in the Eel River. The output of this river in 1915 amounted to 558,893 pounds, valued at $22,246, which was less than one-fourth of the catch made in 1904. Chinook salmon constituted 80 per cent of the catch, the remainder consisting of silver salmon, steelhead, and sturgeon. The catch was handled by local buyers and shipped mainly to San Francisco. Eureka is the center of the county's wholesale trade, two firms located there handling most of the fish taken in Humboldt Bay and the Pacific Ocean. Besides those taken in Eel River some salmon are also taken in Mad River and Redwood Creek. Several men follow clamming in Humboldt Bay at times during the year, the catch being disposed of locally in Eureka. Crab nets are set both in Humboldt Bay and the Pacific Ocean. The catch would probably be greater than at present if it were not that the law prohibits the shipping of crabs out of the county. Some trawl-line fishing is followed from Eureka in the Pacific Ocean, the catch consisting mainly of flounders and rockfishes.

Sacramento County.—This county is situated entirely on the Sacramento River. The total catch in 1915 amounted to 447,167 pounds, valued at $23,132, which was less than one-half of the catch shown for 1904. Nearly 45 per cent of the catch consisted of chinook salmon. The catfish ranks as one of the important species of the county. Gill nets and fyke nets are the only kinds of apparatus used. Sacramento is the most important fishing center in the county. In 1915 three wholesale firms, one of them Chinese, located in this city, together with one in Yolo County across from Sacramento, handled large quantities of fresh fish taken in the vicinity and from a long distance up the river. While many of these fish were shipped to States to the eastward, the major portion probably reached San Francisco. The fishery resources of the Sacramento River are much greater below than above Sacramento. A Chinese firm opposite Antioch salted a large quantity of shad during the year, the product being shipped to China. The European war caused a discontinuation of this work.

Alameda County.—This county is situated on San Francisco Bay, in which waters most of its fishing is done. The total output in 1915 amounted to 1,092,180 pounds, valued at $22,598, as compared with 116,958 pounds, valued at $29,804 in 1904. The noticeable increase in quantity in 1915 was due to a large catch of stingray and shark, disposed of to a nearby plant manufacturing poultry feed and oil. Owing to the low price received, these two species did not add materially to the total value of products. The decrease in value of products since 1904 can be traced mainly to the decline of the oyster industry. Both the clam and shrimp industries are of importance in this county. There are several wholesale firms in Oakland, but most of the fish handled by them were brought from San Francisco and more distant points. One firm of Chinese handled clams only.

Del Norte County.—This is the most northern of the coastal counties of California. Requa, though a mere village, is the leading fishing center of the county, owing its importance in this particular to the location there of a salmon cannery, which handles most of the fish taken in the Klamath River, on which the village is located. A salmon cannery at Smith River, on the river of that name, utilizes practically all of the salmon from that stream. The total output of Del Norte County in 1915 amounted to 924,135 pounds, valued

at $21,912, consisting mostly of chinook and silver salmon. Crescent City, situated on the Pacific Ocean, some fishing for cr was followed, most of the men belonging in San Francisco. T output of salmon since 1904 shows a noticeable increase for the coun The lack of railroads in the county, however, serves as a bar to a great extension of the fishery industries.

Tehama County.—The fishing in this vicinity is done entirely the Sacramento River, the latter flowing through the central p of the county. Aside from a couple of drift gill nets at Corni seines are the only form of apparatus used. The total output of county in 1915 was 186,839 pounds, valued at $13,221, as compa with 176,079 pounds, valued at $7,003 in 1904. The fishing followed entirely for chinook salmon, a few other species, such striped bass, catfish, shad, and sturgeon, being taken incidentally.

Mendocino County.—The fishing in this county is centered mai at Fort Bragg, the only coast town of the county situated on a r road. The output of the county in 1915 amounted to 185,5 pounds, valued at $10,512. No returns are shown for this cou in 1904, as the railroad to Fort Bragg had not then been construct The leading species are chinook and silver salmon, rockfishes, a flounders. Some abalone and mussels are also taken. Trolli is followed to a considerable extent in the ocean off Fort Bra from June to the middle of September, men from other counties a engaging in the fishery. Some trawl-line fishing for rockfishes, flou ers, and "lingcod" is followed in the ocean during March, April, a May whenever the weather permits the men to get out. During t fall and winter of 1915 some silver salmon were taken with gill n in a few of the small rivers of the county, but net fishing was p hibited in these streams after that year.

Yolo County.—The decline in the fisheries of this county betwe 1904 and 1915 was from 341,500 pounds, valued at $12,030, to 249,5 pounds, valued at $10,448, showing a greater proportionate decli in quantity than in value. Considerably more than one-half the ca was made with drift gill nets and the remainder with fyke nets a seines. The most important species are chinook salmon, catfi shad, hardhead, and striped bass. The first-named species ma up about 45 per cent of the value of the entire catch. Broderi across the Sacramento River from Sacramento, is the most importa fishing locality in the county. One wholesale firm located th buys a considerable proportion of the catch, the remainder bei sold to dealers in Sacramento.

Sonoma County.—There is a greater variety of fishing at Bod than at any locality in the county, several different forms of a paratus being used. Among the important products taken in t county are abalone, including pearls and blisters, surf fish, ro fishes, chinook salmon, soft clams, crabs, perch, hard clams, a crawfish, the last named being taken in the Russian River seve miles above its mouth. The total output of the county in 19 amounted to 243,150 pounds, valued at $9,325. No fishing was ported in this county in 1904. Lack of railroad facilities to t coast probably accounts for the slow growth of the fisheries of t county.

Butte County.—The output of this county in 1915 amounted 82,800 pounds, valued at $6,720, or less than one-half in quantity a

slightly over 75 per cent in value of the catch shown for 1904. Seines were the only form of apparatus used. Aside from a few hundred pounds of striped bass and sturgeon the catch was confined to chinook salmon. Most of the catch was shipped from Chico.

Glenn County.—The total fishery output of this county in 1915 amounted to 86,100 pounds, having a value of $6,705. No catch was shown for this county in 1904. Willow is the most important fishing center in the county. Aside from a few chinook taken with drift gill nets the entire catch was taken with seines. Chinook salmon constituted about 94 per cent of the catch, the remainder consisting of sturgeon and striped bass.

Colusa County.—With the exception of a few fykes and hand lines, seines were the only form of apparatus used in the county. The output in 1915 amounted to 58,456 pounds, valued at $4,214. Several species were taken, but chinook salmon constituted about three-fourths of the catch. Colusa, the county seat, is the most important fishing center. No fisheries were shown for this county for 1904.

Sutter County.—The fishery resources of this county show a decline from 148,000 pounds, valued at $6,440, in 1904, to 73,645 pounds, valued at $2,921, in 1915. In 1904 the catch consisted largely of chinook salmon, but in 1915 nearly 70 per cent of the catch was catfish. Most of the fishing is confined to the southern part of the county, from Knights Landing down, and is sold to dealers in Sacramento and Broderick.

San Mateo County.—The output of this county in 1915 amounted to 26,500 pounds, valued at $1,910, as compared with 216,140 pounds, valued at $6,405, in 1904. This difference is due mainly to the decline of the shrimp industry through restrictive legislation. The output consisted of soft clams, crabs, rockfishes, and a few smelt. Aside from a small local consumption, the entire catch was landed and sold in San Francisco, which is not far distant from the fishing grounds of the county.

Shasta County.—This county is the uppermost one on the Sacramento River in which commercial fishing is prosecuted. The output in 1915 amounted to 20,997 pounds, valued at $1,289, which is about one-half of the value of the output in 1904. Aside from a few fish taken with spears, the catch is credited entirely to seines. Chinook salmon and a few striped bass were the only species taken. Cottonwood and Anderson were the principal fishing localities. As in the case of most of the counties on the Sacramento River above Sacramento, the fish are shipped mainly to Sacramento and San Francisco. A few are shipped by the buyers north to Seattle and Portland and to neighboring States eastward. Owing to the current, seines are best adapted for the fisheries of the Sacramento River above Yolo County, and in most instances a horse is necessary in hauling the seine. A law passed by the California legislature in 1916 prohibits all fishing in the Sacramento River above Vina, Tehama County. Previously there was no limit to the fishing in the river.

Los Angeles County.—This is the most thickly settled county in the State and far exceeded any other in the number of persons employed, the amount of capital invested in the fisheries, and the quantity of fishery products taken during the year 1915, but the value of the products was less than in San Francisco County. There were 2,428 persons engaged either as active fishermen or in the various

fishery industries on shore; the value of shore property, fishing ap ratus, boats, etc., was $2,041,401; and the products amounted 27,420,247 pounds, valued at $515,863. Including some chino chum, and silver salmon taken from Columbia River by a vessel fr San Pedro, there were 33 species.

The fisheries are centered in the southern part of the county, Los Angeles Harbor at San Pedro, East San Pedro, and Wilmingt and at Long Beach.

Some fishing is also done from Redonda Beach, Santa Monica, a Venice, and a little from Catalina Island, although the greater part that done at the last-named place is for sport. The present imp tance of the county as a fishing center is due to the rapid growth the tuna industry during recent years, although it has occupied prominent place among the fishing counties of the State for a numb of years because of the quantity of barracuda, flounders, rockfish and other species taken. The bulk of the tuna is sold to the canneri though at times some go to the wholesale dealers, who handle t other species, shipping them to various inland points.

During the year 1915 there were 10 wholesale fresh-fish hou and 1 tuna cannery at San Pedro, 3 tuna canneries at East San Ped 1 at Wilmington, and 5 at Long Beach. There were also a numb of wholesale fresh-fish dealers at Los Angeles. A large percentage the fishermen are Austrians, some Americans, and, in the tuna fishe especially, many are Japanese.

Of the total catch 17,367,259 pounds, or nearly 63 per cent, w albacore or tuna, valued at $260,667. Other important catch were barracuda, 1,555,162 pounds, valued at $59,256; flounde 1,349,103 pounds, valued at $51,731; rockfishes, 690,131 poun valued at $21,882; yellowtail, 679,868 pounds, valued at $18,9 sea bass, 446,064 pounds, valued at $16,953, and bonito, 370,8 pounds, valued at $10,840.

Owing to the fact that the large catch of albacore is practically taken by lines, these are by far the most important form of apparat The total catch of all species by lines was 18,518,522 pounds, valu at $300,417, of which 17,339,499 pounds, valued at $260,223, w albacore. Other important species in the line fishery are the roc fishes, amounting to 690,131 pounds, valued at $21,882.

The gill-net catch ranked next to that of the lines, amounting 1,911,649 pounds, valued at $66,996, of which 893,960 pounds, valu at $34,738, were barracuda. Considerable quantities of bonito, s bass, and yellowtail were also taken by the gill nets. The lampa net also occupies a prominent place in the fisheries of the coun the catch amounting to 1,745,777 pounds, valued at $52,935, consi ing chiefly of yellowtail and barracuda. The trammel net was ne in importance, with a catch of 1,069,496 pounds, valued at $40,45 mostly flounders, known locally as "California halibut." There h been quite an increase in the number of small fishing vessels haili from Los Angeles County. During the year there were 38 of the of 5 tons net or more, with a total net tonnage of 343 and a value $85,700, the majority being engaged in line fishing for albaco The only seines fished from the county were purse seines, operat from six of these vessels, the catch consisting chiefly of barracu and yellowtail, with some bonito, mackerel, sea bass, Spanish mac erel, and albacore. The gill-net catch of the vessel fisheries was chie barracuda, and the trammel nets took only flounders.

The kelp, which grows in abundance along the Pacific coast, has not been utilized commercially in the past, though it has long been known to contain a large percentage of potash. This country has heretofore depended almost entirely on Germany for its supply of potash, but since the beginning of the European war there has been such a decrease in the importation of this product that the Department of Agriculture deemed it expedient to make investigations to determine the feasibility of harvesting the kelp for the purpose of extracting the potash and other ingredients of commercial value. It was found to be entirely practicable and, though the actual work was yet in its incipiency in 1915, extensive preparations were being made in Los Angeles and San Diego Counties for future effort in this important industry, and a number of plants were in operation in 1916. One company operated in Los Angeles County during 1915 and cut 1,500 tons of kelp.

San Diego County.—This county ranked fourth in the State in the quantity of products taken during the year. The total catch was 12,652,996 pounds, valued at $343,919. In the amount of the capital invested, which was $625,021, and the number of persons employed, which was 1,026, it occupied third place. The products included 21 different species, and a number of these were sold both fresh and salted. As in Los Angeles County, the leading species was albacore, with a total catch of 3,630,931 pounds, valued at $54,505, used fresh, and 25,000 pounds, valued at $481, salted. Other species taken in large quantities were flounders, 2,182,658 pounds, valued at $83,826; barracuda, fresh, 1,415,904 pounds, valued at $41,121, and salted, 330,000 pounds, valued at $13,180; rockfishes, 734,464 pounds, valued at $16,703; spiny lobsters, 500,313 pounds, valued at $84,726; rock bass, fresh, 489,450 pounds, valued at $10,032, and salted, 2,750 pounds, valued at $97; yellowtail, fresh, 337,898 pounds, valued at $4,954, and salted, 124,500 pounds, valued at $4,743.

The fisheries of this county are centered at San Diego, where four tuna canneries, one of which also canned a small lot of abalone taken from Mexican waters, and six wholesale fresh-fish houses are located. The abalone canning was somewhat in the nature of an experiment and was discontinued when found to be unprofitable because of the excessive cost of getting abalone from foreign waters.

Many of the fishermen of southern California have been going to Mexican waters during the last eight years or more because they thought those waters more productive than those where they had been fishing nearer their home ports. To do this, they are required to secure a permit from the representatives of the government of Lower California and also to pay a tax of 2 cents per pound on all fish taken from what are claimed as Mexican waters, and it has been stated that this tax is levied even though the fish in question have been taken beyond the 3-mile limit. The bulk of the halibut or flounders and a considerable portion of the barracuda, lobsters, and other species brought to the San Diego market are from fishing grounds off Lower California. It is said that some of the San Diego boats often go as far as 100 miles or more from home when fishing in southern waters.

Line fishing is the most important, because the great bulk of the albacore is taken by that apparatus. The total catch by lines was 5,580,946 pounds, valued at $101,381, of which 3,628,560 pounds,

valued at $54,429, were albacore, the greater part of the remainde consisting of rockfishes, rock bass, and yellowtail.

The rockfish fishery is one of the most important in this county, a well as in Los Angeles County, the catch being all by lines and es pecially good. A great deal of the fishing is done about San Clement Island, located 65 or 70 miles off San Diego. The rockfishes are ofte taken in 100 fathoms or more of water. The season for fishing i mostly in winter, though the fish may be found in these water practically the entire year. It is said to be almost impossible to wor the gear during summer because of the presence of the sharks which d considerable damage to the lines. Either a "hand line" or "se line" is used. The former has about 125 hooks, which are attache to snoods hung from the main line at intervals of about 9 inches The line is laid out on the bottom with a stone made fast t one end, and to the other end is attached a line which extends up t the boat. The crew usually consists of three men, and one man is as signed to tend a single line. The main line is No. 156 hard-laid cot ton, and the snoods are No. 24 cotton twine. If the fish are no biting readily, the lines are sometimes buoyed, and the men mov about in search of more productive grounds.

The set lines are much more extensive and are made of a number o lengths of 200 hooks each, tied together to make one string. Some times as many as 15 to 20 of these pieces are fished as one line The line is weighted at each end with a stone or piece of iron, and buoy line attached. When fishing a bottom that is especially rocky or when the water is rough, additional buoys are attached betwee the end ones to prevent the line becoming entangled. The main lin is No. 240 hard-laid cotton, and the snoods are No. 24 cotton twine The snoods are about 3½ feet long and are attached to the main line a intervals of from 5 to 5½ feet. The buoy lines are manila. It is ofte difficult to raise these set lines, especially if the water is rough and it sometimes requires the combined effort of two or three me to accomplish this. The bait for the lines is sardines or fish cut tings. These lines are practically the same as those used in the othe counties of southern California.

The lobster pots ranked next to the lines in importance. Th catch, which consisted entirely of spiny lobsters, amounted t 500,313 pounds, valued at $84,726. Spiny lobsters are not take north of Santa Barbara County, but are found in considerabl numbers from that county southward. The State law prohibit fishing for them in California waters during the summer when the are spawning, but there seems to be no State prohibition agains the importation of the Mexican lobster during that period, an as a result of this lack of restriction many of the fishermen from Sa Diego have been going to the coast of Lower California during recen years, establishing camps for the summer season, and sending grea quantities of lobsters to the California market. Many are oppose to this practice, because they are of the opinion that the lobste should be protected when spawning in Mexican waters as wel as in California, and are anxious to have legislation to prohibi importing them during the closed season. The best lobster-fish ing grounds in the early fall are on the kelp beds near the shore where the lobsters seem to gather for protection, but as cold weathe advances they go out to deeper water. It is often very difficult t raise the pots because of the heavy swell, and at times the me

ave to attach the buoy line to the moving boat in order to get hem up. The pots are made of laths and are mostly about 3 feet ong, 30 to 32 inches wide at the bottom, narrowing to about 12 nches at the top, and are 12 inches high. They are set singly with buoy line attached to each pot in water varying in depth from to 20 fathoms. When fishing in deep water, it is often necessary o use 40 to 60 pounds of ballast to a single pot.

The trammel-net fishery is also quite important. The catch onsisted entirely of flounders and amounted to 2,182,408 pounds, alued at $83,816. Trammel nets are made very much on the plan f a gill net, though they have three webs instead of one. A web f small-mesh netting is hung between two webs of larger mesh, he middle one hanging deeper than the two outside ones, so that he fish striking from either side and forcing the small mesh net hrough the larger mesh forms a bag from which it is impossible to scape. The two outside webs are 23-inch mesh, No. 12 cotton wine, and about 12 feet deep, and the center one is 9-inch mesh, No. 9 cotton twine, and about 16 feet deep. One net is 36 to 40 athoms long, and a number are usually tied in a string and fished s one net, sometimes as many as 20 being used to one string.

The gill net ranks next in importance. The catch amounted to 2,260,329 pounds, valued at $68,388. This net is used chiefly for ishing barracuda, and over 69 per cent of the total catch consisted f that species, the number of pounds being, fresh, 1,362,441, valued t $39,957, and salted, 198,000 pounds, valued at $7,900. Sea bass nd yellowtail also figure quite prominently in the gill-net catch, he former amounting to 261,703 pounds, valued at $8,351, and the atter to 212,645 pounds, fresh, valued at $3,389, and 55,500 pounds, alted, valued at $1,983.

The quantity of kelp harvested during 1915 was about 1,000 tons, valued at $1,000.

The fishing vessels of 5 tons net or more hailing from San Diego County numbered 13, with a total net tonnage of 112 tons and a total value of $34,550. Several of these are from La Playa, located on San Diego Bay opposite San Diego, and are fished by Portuguese, who fish mostly in Mexican waters and sometimes go several hundred miles from their home port. The greater part of their catch is salted in the hold of the vessel and consists chiefly of barracuda, jewfish, Spanish mackerel, and rockfishes. Other vessels take considerable quantities of albacore.

Monterey County.—The products of the fisheries of this county in 1915 amounted to 14,085,399 pounds, valued at $183,806, and the investment was $455,887. The number of persons employed in the fisheries and various shore industries was 694. Monterey, located on Monterey Bay, is the center of the fisheries of the county. There are located here 13 wholesale fresh-fish houses and two canneries, where the only sardines canned in the State were canned during the year. In addition to these species, one of these houses also prepared canned, mild-cured, and salted salmon. One firm also was engaged in drying squid, which was mostly for export to China. The only real abalone cannery operated in the State during 1915 was located at Point Lobas, about 5 miles south of Monterey. Monterey Bay is the southern limit of salmon, and the major portion of those found there are chinook, a comparatively small number of silver salmon also being taken.

Salmon usually appear in this region in large numbers, and mos of the catch is taken in the spring and early summer. The salmo are taken entirely with troll lines, and practically all in the bay The anchovies, kingfish, mussels, perch, sardines, and squid ar also practically all taken in the bay, and the rockfishes, "lingcod," jewfish, sablefish, and sole are all taken in the ocean. Sardine come in June and from that time until early in August are rathe small in size. After this they run larger and continue so unti winter. During December and January they are especially large From March until late in May there are no sardines of any conse quence. The catch for the year was rather poor.

In quantity the catch of squid was greater than any other, bu in value the catch of chinook salmon was more than double tha of any other species. The amount of squid taken was 6,140,00 pounds, valued at $30,700. The next in quantity were sardines with a catch of 4,006,200 pounds, valued at $20,031. The catch o chinook salmon and rockfishes, all of which were taken by lines was 1,694,660 pounds, valued at $67,786, and 1,306,816 pounds valued at $41,818, respectively. Some silver salmon and othe species were also taken with lines, but in minor quantities.

The lampara net fishery produced the greatest quantity; the tota catch of this apparatus was 8,923,200 pounds, valued at $46,151 The low value of the lampara catch is explained by the fact that nearl two-thirds of the amount taken were squid, which sold for about $1 per ton, practically all of them being handled by one firm for dryin for the Chinese trade.

Squid are dried by the sun-and-air process. A suitable plat i selected beyond the city limits, because the city authorities prohibi the work within the limits on account of the disagreeable odor an the burning off of the grass which is necessary, because the phos phoric acid and salt water in the squid would kill it and cause it t rot, thus rendering the ground unsuitable for drying. The squi are spread on the ground, turned and worked over every day unti thoroughly dried. Under favorable conditions 10 to 12 days ar sufficient time for drying. Under normal conditions the quantit of fresh squid reported would have yielded a larger percentage of th dried product, but certain conditions were unfavorable during th season, and some were lost.

Other species taken by lampara nets were sardines, 2,906,20 pounds, valued at $14,531, and a small lot of anchovies and herring

The seine catch was largely made up of sardines, which amounted t 1,100,000 pounds, valued at $5,500. Small quantities of barracud and squid were also taken with seines.

As stated above, this is the only county in the State in which aba lone canning was done in 1915, except a small lot brought from Mexic and packed at a San Diego tuna plant. The catch, including thos taken for the cannery and some by independent fishermen fro Monterey, amounted to 547,424 pounds, valued at $10,939. Th abalone subsist on vegetable matter and are found only on roc bottom where there is a sufficient growth of vegetation to maintai them. Several varieties are found on the California coast, but the re abalone is the one with which we have to deal chiefly, as that i utilized for canning at Point Lobas. Other varieties are the gree black, pink, and corrugated. The red abalone is found from norther California to the Santa Barbara Island region. Only about 10 pe

ent of the red shells are suitable for commercial purposes. They re sold for manufacture into novelties and various kinds of ornaments.

As very few red abalones are exposed at low tide, and as they are ot found in water deeper than will permit of the penetration of ufficient sunlight to support the vegetable growth on which the balone depends for subsistence, they are mostly taken by divers, ho use a regular diving outfit such as is employed by wreckers and ther workers under water. A diving outfit, including the helmet, uit, air pumps, etc., costs about $800. The divers are all Japanese, nd they require that the pumps and life lines be operated by men f their own selection, who are generally some of their own people. he depth of the water in which they operate does not often exceed 125 eet, but they have worked at a depth of 150 feet. The greater the epth the more difficult it is to furnish air to the men, and it is not ecessary to take risks, as there seems to be a sufficient supply of aba- one at less depth. The divers rarely get out of sight of land, work nly when the water is smooth, and frequently go out and return ithout making a descent or with only a part of a day's work done be- ause of rough seas. A diver usually remains under water 2½ to 3 hours nd uses a short pointed iron, similar to a crowbar, to pry the abalone rom the rocks. If one is expert enough to get the iron under the hell before the abalone has been disturbed and has had an oppor- unity to take hold of the rock, it is comparatively easy to capture it; therwise it can take such a firm grip that it is very difficult to get up with the iron and impossible to break the hold with the hands lone. The abalone are hauled up to the boat in carriers made with anila rope of about one-fourth inch diameter, one of which is ttached to each end of a line suspended from the boat; as one carrier s raised the other is lowered. From one to two dozen are placed in carrier, the weight averaging 45 pounds to a dozen.

For shoal-water fishing the fishermen use a small boat and hooked ole. To aid in locating the abalone they have a wooden box avera- ing about 8 by 11 inches at the top, widening toward the bottom to bout 16 by 19 inches, and about 19 to 20 inches deep, the top being pen and the bottom fitted with a glass. This box is attached to the ide of the boat by strings, so that it may be easily removed when eturning to port, with the bottom immersed so that the fisherman an get a good view of the ocean bottom as he peers through the lass. The poles vary in length from 1 to about 4 fathoms, as that is bout the maximum depth of water fished in this way. The lower nd is fitted with an iron hook, and the fisherman holding the pole in is hand can by a quick movement insert the hook under the edge f the shell and jerk it loose from the rock.

The law permits abalone fishing in this county at any time except luring the month of February, when the abalone are protected because f spawning. The spawning period, however, is said to extend from bout the middle of January until about the middle of March. It s estimated that an adult female will produce upward of one million ggs during the season. When liberated and fertilized, the eggs re said to float about for a time and then settle on the bottom for eproduction, and there is no doubt that many of them settle on andy or soft bottom and are lost.

One hundred pounds of abalone in the shell will yield about 60 ounds of meat. When preparing for canning only about 30 per ent of the meat is used, the remainder being discarded as unfit for

packing. The meat as it comes from the shell is very tough, and is necessary to pound it well with sticks in order to break the fibe Abalone were not taken in the southern counties of California durir 1915 for commercial purposes, the law prohibiting having more tha 10 of them in one's possession at one time, precluding any effo toward commercializing the fishery. In past years considerable quai tities were taken in Los Angeles County.

Santa Cruz County.—The aggregate product of the fisheries this county in 1915 was 3,952,257 pounds, valued at $125,07 Nearly 50 per cent of this amount was sole, the catch of that speci amounting to 1,892,600 pounds, valued at $52,315. Flounders als contributed largely to this total, the catch being 746,935 pounds, va ued at $21,596. The entire catch of sole and flounders was taken i paranzella nets. "Lingcod," hake, kingfish, and other species are als taken in these nets.

With the exception of crabs, the gill-net catch of this count is of minor importance. The crab gill nets do not differ in gener construction from any other. They are made of No. 6 cotton twin about 45 fathoms long, 15 feet deep, and 7½-inch mesh. The are put out in the evening, usually about six of the 45-fatho lengths in a string, and sunk so that the lead line is near the botton with a buoy line attached to each end. They are permitted t drift during the night and are taken up in the morning. Th method of fishing crabs has been in vogue for about four years and usually quite remunerative. Crab lines are not used here, but small number of crabs are taken in paranzella nets. The catch crabs in 1915 was 233,473 pounds, valued at $15,917.

Rockfishes and salmon constituted the bulk of the line catch The rockfishes taken amounted to 378,478 pounds, fresh, value at $11,355, and 8,000 pounds, salted, valued at $400. The catc of chinook salmon amounted to 100,592 pounds, valued at $4,023 and that of silver salmon to 28,697 pounds, valued at $1,147 Some "lingcod," sablefish, and kingfish were also taken by lines.

Octopi have been known to exist in this region for some tim and have been taken in paranzella nets, but no special effort ha been made to capture them until recently. A Santa Cruz fisherma constructed some traps for the purpose of catching crabs, but o lifting the traps found them filled with octopi instead of crabs an decided they could be taken in sufficient quantities to justify fu ther efforts. These traps are made of galvanized wire of 1-inc mesh and are about 3 feet long, 2½ feet wide, and 1½ feet high. The have openings in the top about 8 inches square for the entrance o the octopi, and doors in the end for the removal of the catch. Th traps are baited with skates or any fish offal that is available, an are set singly with a buoy line attached to each. The season i chiefly during the winter and spring. The catch is shipped to Sa Francisco, where there is quite a demand from the Orientals, wh consider this fish a delicacy. Only 6,000 pounds, valued at $600 were taken during 1915, but there is every reason to believe tha subsequent years will show a considerable increase in this business Practically all the catch of this county is shipped to San Francisco by several wholesale dealers in Santa Cruz, and practically all th fishermen of the county hail from that point. The investment i the fisheries of the county for the year was $71,275, and the tota number of persons employed was 65.

Santa Barbara County.—The fisheries of this county produced 538,600 pounds, valued at $41,130, in 1915 and are centered at Santa Barbara, where the only wholesale market in the county is located. Santa Barbara Channel, located off this county, is the northern limit of spiny lobsters. They are taken in considerable numbers by fishermen camping on the islands in the channel, chiefly Ana Capa and Santa Cruz, and also by some fishing from Santa Barbara. This fishery contributed about 50 per cent of the total value of the products for the county, the catch amounting to 158,300 pounds, valued at $20,729. The gill-net fishery contributed about 49 per cent of the total catch of the county.

Orange County.—This county, located on the southern coast of the State, between the two important fishing counties of Los Angeles and San Diego, is much more thinly settled and is comparatively unimportant in its fisheries. The fisheries are conducted from only two localities, Newport and Laguna Beach, and the products amounted to 988,980 pounds, valued at $38,702. The most important form of apparatus was seines, the catch of which was over 25 per cent of the total quantity, and over 30 per cent of the total value for the county. Smelt constituted the bulk of the catch with this apparatus, the catch of this species amounting to 226,000 pounds, valued at $11,300. The catch by lines, amounting to 261,380 pounds, valued at $8,356, ranked next in both quantity and value, and barracuda and rockfishes were the most important species. The gill-net fishery, which amounted to 132,950 pounds, valued at $4,795, was next in importance in value, with sea bass and barracuda the leading species. The catch with lampara nets was 198,000 pounds, valued at $4,920, and consisted chiefly of rock bass and yellowtail. The trammel-net catch was all flounders and amounted to 132,250 pounds, valued at $6,308. Spiny lobsters, worth $2,093, and a small lot of hard clams were also taken by the fishermen of this county.

San Luis Obispo.—Although this county has quite an extensive coast line, it is very sparsely settled, and the commerical fisheries are of little importance when compared with some of the other coastal counties. Pismo and Morro are the only localities from which commercial fisheries are prosecuted. Clam forks, gill nets, and lines were the only forms of apparatus used. The total catch amounted to 197,856 pounds, valued at $16,420. The catch taken with lines was 85,000 pounds of rockfishes, valued at $3,400, which was greater in quantity than that with any other apparatus, but the value of the hard clams, taken with forks, amounted to more than 55 per cent of the total value of that species for the State. The quantity of hard clams taken was 34,856 pounds, valued at $9,150.

Ventura County.—The product of the fisheries of this county amounted to 106,765 pounds, valued at $5,443. Of the 27 counties in which commercial fisheries are conducted in California, this county is among the least important; there are only three counties in which the value of the catch was less than in Ventura, two of them being located on Sacramento River and one on the coast. The fishing is all done from Ventura, a small town of only a few thousand inhabitants, and the bulk of the catch consisted of smelt, taken with seines; flounders, taken with trammel nets; rockfishes and flounders, taken with lines; and spiny lobsters, which are always caught in pots.

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES.

	Alameda.		Butte.		Colusa.		Contra Costa.		Del Norte.		Glenn.		Humboldt.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels transporting							4							
In shore fiheries	58		40		58		444		141		26		208	
On shore, in canneries, etc	47		15		9		279		89		6		7	
Total	105		55		67		727		230		32		215	
INVESTMENT.														
Vessels transporting							2	$5,500						
Tonnage							12							
Outfit								425						
Boats:														
Gasoline	12	$14,900			1	$400	84	51,700	9	$4,050	1	$200	14	$7,200
Sail, row, etc	32	1,025	15	$375	15	1,655	160	21,900	65	2,490	6	400	145	3,430
Apparatus, shore fisheries:														
Seines			13	1,300	9	675	6	625	2	700	5	425	9	750
Length in yards			1,755		825		1,170		440		550		1,570	
Gill nets	9	1,585					395	109,650	114	26,150	1	125	275	18,205
Length in yards	7,080						211,050		22,320		150		39,450	
Beam trawls	9	400												
Hoop nets									200	500			145	250
Dip nets													5	50
Lines		80				1								25
Dredges, tongs, hoes, etc		30								1				3
Fyke nets					35	330								
Shore and accessory property		80,850		2,200		1,625		136,200		51,680		800		400
Cash capital		16,500						18,000		25,000				
Total		115,370		3,875		4,686		344,000		110,571		1,950		30,313
PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Carp					2,800	$80	97,000	$1,530						
Catfish					6,700	264								
Flounders: Fresh	5,000	$150					16,000	238					51,548	$1,858
Herring: Fresh							7,000	34					25,494	503
"Lingcod:" Fresh													2,609	104
Perch	2,000	180					12,000	400					15,000	410
Pike, Sacramento														
Rockfishes: Fresh					400	20	4,600	90						
													16,905	577

Salmon:														
Chinook, fresh	300	18	81,500	$6,520	44,000	3,360	1,860,425	95,974	704,420	$16,002	81,300	$6,095	499,196	19,501
Silver									190,398	3,730			86,072	3,304
Steelhead trout													32,405	1,288
Shad:														
Fresh							4,348,640	45,800						
Roe					1,500	145								
Sharks	65,000	163												
Smelts	31,500	2,175					12,000	780					39,889	1,688
Sting-ray	605,000	1,512												
Striped bass	99,000	7,565	500	40	700	63	1,036,263	84,676			1,500	120		
Sturgeon			600	40	2,030	135					3,000	310	8,010	250
Sturgeon roe			200	120	326	147					300	180		
Surf fish													20,000	600
Miscellaneous fishes							1,400	28						
Clams:														
Hard													1,760	427
Soft	21,250	5,950											6,280	1,250
Mussels	130	35							2,650	180				
Oysters: Eastern, market													42	14
Crabs									26,667	2,000			24,420	1,022
Shrimp	263,000	4,850												
Total	1,092,180	22,598	82,800	6,720	58,456	4,214	7,395,328	229,550	924,135	21,912	86,100	6,705	829,630	32,796

	Los Angeles.		Marin.		Mendocino.		Monterey.		Orange.		Sacramento.		San Diego.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels fishing	114												37	
On vessels transporting	9						6							
In shore fisheries	825		166		40		171		56		162		336	
On shore, in canneries, etc	1,480		29				517		2		33		653	
Total	2,428		195		40		694		58		195		1,026	
INVESTMENT.														
Vessels fishing:	38	$85,700											13	$34,550
Tonnage	343												112	
Outfit		9,175												5,766
Vessels transporting	*a* 6	21,800					3	$12,500						
Tonnage	203						21							
Outfit		1,190						785						
Boats:														
Gasoline	324	521,800	52	$20,900	11	$4,300	124	76,000	19	$17,150	68	$16,000	135	196,250
Sail, row, etc	40	1,115	53	3,350	41	925	19	5,700	10	290	83	11,340	27	721

a Includes 2 scows of 146 net tons, valued at $5,500.

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES—Continued.

	Los Angeles.		Marin.		Mendocino.		Monterey.		Orange.		Sacramento.		San Diego.	
INVESTMENT—continued.														
Apparatus, vessel fisheries:	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
Seines	6	$8,400												
Length in yards	3,600													
Gill nets	153	4,255												
Length in yards	10,600													
Pots	20	50											60	$150
Lines	392													375
Lampara nets	1	400												
Paranzella nets	1	250												
Trammel nets	95	2,325											30	750
Length in yards	7,600												2,400	
Apparatus, shore fisheries:														
Seines			18	$1,425			1	$1,600	16	$4,120				
Length in yards			2,220				320		4,800					
Gill nets	1,244	35,870	47	6,510	25	$500	7	2,250	150	4,200	111	$13,525	486	12,150
Length in yards	71,680		20,195		875		5,580		8,400		24,010		26,640	
Hoop nets			630	1,260										
Pots and traps	1,432	3,164							250	620			1,053	2,333
Lines		2,742		95		750		1,980		213				1,795
Dredges, tongs, hoes, etc				281		5				5				
Lampara nets	37	14,800					20	11,200	1	400				
Paranzella nets	32	4,800												
Trammel nets	1,401	39,000	1	100					180	4,500			520	10,400
Length in yards	67,440		320						14,400				41,000	
Fyke nets											280	2,725		
Abalone outfit				1		1		1,636						800
Shore and accessory property		1,097,101		119,740		200		274,081		1,850		42,250		241,661
Cash capital		187,072		7,000				68,155		2,000		7,800		117,500
Total		2,041,401		160,662		6,681		455,887		35,348		93,640		625,201
PRODUCTS.														
Albacore (or tuna):	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Fresh	17,367,259	$260,667							6,000	$150			3,630,931	$54,505
Salted													25,000	481
Anchovies:														
Fresh	12,585	130												
Salted							16,000	$1,600						
Barracuda:														
Fresh	1,555,162	59,256					34,000	680	81,800	3,872			1,415,904	41,121
Salted													330,000	13,180
Bonito	370,844	10,840					2,000	50	2,950	88			42,462	774

Carp											43,201	$554		
Catfish											91,646	3,888		
Croaker	3,150	65												
Flounders:														
Fresh	1,349,103	51,731	7,500	$150	13,000	$590	51,000	1,275	135,150	6,391			2,182,158	83,826
Salted							9,500	475						
Hake:														
Fresh	17,322	571							3,300	107				
Salted													24,000	960
Hardhead											42,237	2,122		
Herring:														
Fresh			210,000	1,390			1,000	20						
Salted			50,000	1,000										
Jewfish:														
Fresh	20,890	414					300	10	4,200	84			87,071	1,271
Salted													138,000	5,020
Kingfish	335,255	8,904					38,350	958	18,500	370			2,156	50
"Lingcod:" Fresh					1,000	40	103,000	2,060						
Mackerel:														
Fresh	174,481	5,031							63,500	1,270			10,805	216
Salted													6,450	259
Mullet									3,000	300				
Perch	44,268	1,014	97,500	1,965			6,000	300	5,500	165			217	5
Pike, Sacramento											4,887	171		
Pompano	15,690	1,568							850	85			229	27
Rock bass:														
Fresh	258,334	10,331							143,500	3,587			489,450	10,032
Salted													2,750	97
Rockfishes: Fresh	690,131	21,882	3,000	125	35,000	1,750	1,306,816	41,818	141,280	4,235			734,464	16,703
Sablefish							17,560	878						
Salmon:														
Chinook—														
Fresh	66,000	3,330	6,900	330	80,500	4,190	1,694,660	67,786			214,346	12,441		
Salted					20,000	2,400								
Chum	38,093	190												
Silver	12,330	370			26,500	1,060	70,000	2,800						
Sardines:														
Fresh	305,150	6,103					4,006,200	20,031	22,500	225				
Salted			1,400	80										
Sculpin	6,613	263							1,850	75				
Sea bass	446,064	16,953	70,509	3,500			13,360	547	35,200	1,735			261,703	8,351
Sea trout	464	23							3,500	105			119	5
Shad:														
Fresh											16,826	313		
Salted											10,000	125		
Roe											2,940	287		
Sharks	2,500	50												
Skates	6,000	120												
Smelts	97,737	4,168	78,600	3,900			5,314	425	226,000	11,300			115,707	5,597
Sole	19,692	591	50	2									679	19
Spanish mackerel	295,571	9,348											60,034	1,381
Split-tail											15,475	328		
Striped bass			26,900	2,165							34,354	2,839		

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES—Continued.

PRODUCTS—continued.	Los Angeles.		Marin.		Mendocino.		Monterey.		Orange.		Sacramento.		San Diego.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Sturgeon											620	$49		
Surf fish			68,500	$4,795										
Yellowtail:														
Fresh	679,868	$18,876							73,500	$2,205			337,898	$4,954
Salted													124,500	4,743
Miscellaneous fishes	1,972	42	5,300	225							635	15	496	8
Abalone:														
Alive					3,035	$97								
Meat			4,550	158	3,000	185	547,424	$10,939					57,000	3,168
Shells			2,000	450									72,000	1,440
Pearls and blisters				40										
Clams:														
Hard	296	104	26,416	7,070			96	25	800	260				
Soft			11,880	4,422										
Mussels	4,820	578	120	8	3,500	200	1,810	110						
Oysters:														
Eastern, market			14,840	8,814										
Native, market			8,435	6,513										
Squid	21,325	426					6,140,000	30,700						
Crabs			168,600	16,494			17,210	129						
Spiney lobsters	201,094	20,415							16,100	2,093			500,313	84,726
Turtles	184	9												
Kelp	3,000,000	1,500											20,000,000	1,000
Other seaweeds							3,799	190						
Total	27,420,247	515,863	862,991	63,596	185,535	10,512	14,085,399	183,806	988,980	38,702	477,167	23,132	12,652,996	343,919

PERSONS ENGAGED.	San Francisco.		San Joaquin.		San Luis Obispo.		San Mateo.		Santa Barbara.		Santa Cruz.		Shasta.	
	Number.	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels fishing	392										4			
On vessels transporting	9								2					
In shore fisheries	552		137		54		8		74		55		20	
On shore, in canneries, etc	261		29				32		8		6			
Total	1,214		166		54		40		84		65		20	

Vessels fishing	19	$223,625									1	$6,000		
Tonnage	2,721										11			
Outfit		36,050										1,500		
Vessels transporting	5	19,500							1	$2,000				
Tonnage	68								6					
Outfit		1,525								100				
Boats:														
Gasoline	290	259,710	57	$25,825	5	$1,400	3	$2,275	14	17,400	45	37,775		
Sail, row, etc	105	8,805	60	5,950	4	200			31	1,295	8	245	6	$110
Apparatus, vessel fisheries:														
Lines		775												
Paranzella nets	6	2,250									1	400		
Apparatus, shore fisheries:														
Seines	21	2,025	12	1,335			1	5					3	350
Length in yards	1,075		1,575				5						420	
Gill nets	271	54,450	130	25,120	28	1,072			156	5,004	180	5,000		
Length in yards	38,300		41,550		2,144				10,018		14,400			
Hoop nets	3,800	11,400					20	60						
Pots and traps									1,310	2,720	12	60		
Lines		2,300				75		4		20		460		
Dredges, tongs, hoes, etc		776				52		3						3
Lampara nets	6	2,700												
Paranzella nets											4	1,300		
Trammel nets									85	2,125				
Length in yards									2,800					
Bag nets	70	2,000												
Fyke nets			1,900	16,585										
Abalone outfit												20		
Shore and accessory property		499,450		29,875		300		58,632		10,950		11,015		500
Cash capital		57,000		8,300				5,000		5,000		7,500		
Total		184,341		112,990		3,099		65,979		46,614		71,275		963
PRODUCTS.	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Anchovies: Fresh	68,800	$1,600												
Barracuda: Fresh	5,000	200			3,000	$120			162,000	$6,210	5,780	$231		
Bonito									30,000	870				
Carp	120,000	2,400	63,286	$1,474										
Catfish			328,787	16,338										
Cod, salted	4,952,692	161,695												
Flounders: Fresh	2,227,919	37,217							115,500	3,855	746,935	21,596		
Hake: Fresh	160,350	704							6,650	219	33,630	336		
Hardhead			4,674	146										
Herring: Fresh	500,000	5,000									890	19		
Jewfish: Fresh									4,000	80				
Kingfish	91,785	2,057							2,000	40	162,457	4,873		
"Lingcod:"														
Fresh	340,151	8,721									121,400	3,642		
Salted											3,500	175		

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES—Continued.

PRODUCTS—continued.	San Francisco.		San Joaquin.		San Luis Obispo.		San Mateo.		Santa Barbara.		Santa Cruz.		Shasta.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Mackerel: Fresh									5,000	$145	113	$6		
Perch	16,450	$1,250							1,000	20	6,000	300		
Pike, Sacramento			4,960	$129										
Pompano	1,894	284									687	68		
Rock bass: Fresh									4,000	160				
Rockfishes:														
Fresh	852,300	40,519			85,000	$3,400	18,000	$550	24,000	768	388,278	11,649		
Salted											8,000	400		
Sablefish	39,920	130									7,023	351		
Salmon:														
Chinook, Fresh	136,000	7,500	200,409	10,390							119,592	4,783	19,750	$1,147
Silver											29,897	1,195		
Sardines: Fresh	30,925	1,052							1,000	20	21,931	220		
Sculpin											350	7		
Sea bass	256,325	12,871	1,250	50					50,000	1,900	86,860	3,474		
Sea trout									2,000	80				
Shad:														
Fresh	1,600,000	9,000	636,820	8,047							478	24		
Roe			17,898	1,619										
Sharks	472	23												
Skates	164,050	672									7,600	76		
Smelts	374,000	15,295			75,000	3,750	1,500	60	16,325	865	30,000	1,200		
Sole	3,848,908	55,327									1,892,600	52,315		
Spanish mackerel									41,300	826				
Splittail			1,466	55										
Striped bass	283,000	24,000	69,646	5,898							350	17	1,247	142
Sturgeon			59	5										
Sturgeon roe			22	11										
Tomcod	33,112	587									8,800	352		
Whitebait	56,250	2,250												
Yellowtail: Fresh									3,150	88				
Miscellaneous fishes	6,000	150	1,375	70										
Abalone: Alive											20,991	420		
Clams:														
Hard					34,856	9,150					1,032	272		
Soft	23,000	5,300					2,200	700						
Mussels	6,000	1,200									210	15		
Oysters: Eastern, market	360,892	156,745												
Octopus	18,909	1,573									13,400	1,144		
Squid	50,000	1,500												
Crabs	934,985	91,972					4,800	600			233,473	15,917		
Spiney lobsters									158,300	20,729				

Shrimp	35,000	700												
Turtles			22	4										
Sea lion									9,375	4,120				
Cod tongues	7,400	370												
Other seaweeds									3,000	135				
Total	17,602,489	649,864	1,330,674	44,236	197,856	16,420	26,500	1,910	638,600	41,130	3,952,257	125,077	20,997	1,289

	Solano.		Sonoma.		Sutter.		Tehama.		Ventura.		Yolo.		Total.	
PERSONS ENGAGED.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
On vessels fishing									4				551	
On vessels transporting	5												35	
In shore fisheries	384		35		20		110		10		92		4,282	
On shore, in canneries, etc	39						39				4		3,584	
Total	428		35		20		149		14		96		8,452	
INVESTMENT.														
Vessels fishing									2	$4,500			73	$354,375
Tonnage									11				3,198	
Outfit										300				52,791
Vessels transporting	3	$10,700											20	72,000
Tonnage	20												330	
Outfit		1,485												5,510
Boats:														
Gasoline	110	61,200	8	$5,475	5	$1,200					38	$8,000	1,429	1,351,110
Sail, row, etc	163	28,500	12	275	8	180	24	$545	5	250	32	3,745	1,169	104,816
Apparatus, vessel fisheries:														
Seines							1	150					7	8,550
Length in yards							100						3,700	
Gill nets													153	
Length in yards													10,600	4,255
Pots									40	80			120	280
Lines										20				1,562
Lampara nets													1	400
Paranzella nets													8	2,900
Trammel nets													125	3,075
Length in yards													10,000	
Apparatus, shore fisheries:														
Seines			1	200	3	375	22	2,925	2	300	3	350	147	19,485
Length in yards			150		450		3,235		200		435		21,195	
Gill nets	259	82,450	6	1,800	12	1,500	2	225			60	6,250	950	413,591
Length in yards	39,200		3,000		2,040		300				11,080		799,552	
Beam trawls													9	400
Hoop nets			65	115									4,860	13,585
Dip nets			6	14									11	64

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES—Continued.

	Solano.		Sonoma.		Sutter.		Tehama.		Ventura.		Yolo.		Total.	
INVESTMENT—continued.														
Apparatus, shore fisheries—Contd.	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
Pots and traps									130	$260			4,187	$9,157
Lines				$255						50				10,849
Dredges, tongs, hoes, etc				11										1,170
Lampara nets													64	29,100
Paranzella nets													36	6,100
Trammel nets									8	200			2,195	56,325
Length in yards									640				126,600	
Bag nets													70	2,000
Fyke nets					50	$350					220	$1,650	2,485	21,640
Abalone outfit				2										2,460
Shore and accessory property		$60,625		585		200		$3,170				5,450		2,731,390
Cash capital		10,000										3,500		545,327
Total		254,960		8,732		3,805		6,865		6,610		28,945		5,824,263
PRODUCTS.														
Albacore (or tuna):	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Fresh									20,000	300			21,024,190	$315,622
Salted													25,000	481
Anchovies:														
Fresh													81,385	1,730
Salted													16,000	1,600
Barracuda:														
Fresh													3,262,646	111,690
Salted													330,000	13,180
Bonito													448,256	12,622
Carp					11,802	$131					12,726	$197	350,815	6,366
Catfish					49,346	2,021	275	$11			40,300	1,777	517,054	24,299
Cod, salted													4,952,692	161,695
Croaker													3,150	65
Flounders:														
Fresh			1,500	$60					11,250	$354			6,914,063	209,291
Salted													9,500	475
Hake:														
Fresh													221,252	1,937
Salted													24,000	960
Hardhead					1,724	126					24,788	1,228	73,423	3,622
Herring:														
Fresh			20,000	150									764,384	7,116
Salted													50,000	1,000

Jewfish:														
Fresh													116,461	1,859
Salted													138,000	5,020
Kingfish									5,500	110			656,003	17,362
"Lingcod:"														
Fresh			2,700	120									570,860	14,687
Salted													3,500	175
Mackerel:														
Fresh													253,899	6,668
Salted													6,450	259
Mullet													3,000	300
Perch			10,000	300					850	18			216,785	6,327
Pike, Sacramento	25	$1			523	19					489	19	15,884	449
Pompano													19,350	2,032
Rock bass:														
Fresh													895,284	24,110
Salted													2,750	97
Rockfishes:														
Fresh			22,000	1,110					19,080	730			4,336,254	145,816
Salted													8,000	400
Sablefish													64,503	1,359
Salmon:														
Chinook—														
Fresh	1,179,244	60,524	18,000	560	3,071	173	185,760	13,165			88,560	4,760	7,283,933	338,549
Salted													20,000	2,400
Chum													38,093	190
Silver													415,191	12,459
Steelhead trout													32,405	1,288
Sardines:														
Fresh													4,387,706	27,651
Salted													1,400	80
Sculpin													8,813	345
Sea bass													1,221,262	49,381
Sea trout													6,083	213
Shad:														
Fresh	176,827	2,650			1,245	36	210	4			64,962	1,108	6,846,008	66,982
Salted													10,000	125
Roe					61	6					4,634	434	27,033	2,491
Sharks													67,972	236
Skates													177,650	868
Smelts									33,500	1,775			1,137,072	52,978
Sole													5,761,929	108,254
Spanish mackerel													396,905	11,555
Split-tail					75	1							17,016	384
Stingray													605,000	1,512
Striped bass	208,544	17,787	3,250	260	5,744	407	539	38			12,911	911	1,784,448	146,928
Sturgeon	2,367	181					55	3			183	14	16,924	987
Sturgeon roe	427	250											1,275	708
Surf fish			39,000	1,860									127,500	7,255
Tomcod													41,912	939
Whitebait													56,250	2,250

PERSONS ENGAGED, INVESTMENT, AND PRODUCTS OF THE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES—Continued.

	Solano.		Sonoma.		Sutter.		Tehama.		Ventura.		Yolo.		Total.	
PRODUCTS—continued.														
Yellowtail:	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*	*Number.*	*Value.*
Fresh													1,094,416	$26,123
Salted													124,500	4,743
Miscellaneous fishes					54	$1							17,232	539
Abalone:														
Alive													24,026	517
Meat			119,000	$2,380									730,974	16,830
Shells													74,000	1,890
Pearls and blisters				1,200										1,240
Clams:														
Hard			600	275									65,856	17,583
Soft			2,550	485									67,160	18,107
Mussels													19,240	2,326
Oysters:														
Eastern, market													375,774	165,573
Native, market													8,435	6,513
Octopus													32,309	2,717
Squid													6,211,325	32,626
Crabs			4,000	300									1,414,155	128,434
Crawfish			550	265									550	265
Spiney lobsters									16,585	$2,156			892,392	130,119
Shrimp													298,000	5,550
Turtles													206	13
Sea lion													9,375	4,120
Cod tongues													7,400	370
Kelp													5,000,000	2,500
Other seaweed													6,799	325
Total	1,567,434	$81,393	243,150	9,325	73,645	2,921	186,839	$13,221	106,765	5,443	249,553	$10,448	93,338,703	2,506,702

PRODUCTS BY APPARATUS.

Many different forms of apparatus are used in the fisheries of California. Some of these, introduced by Italians, are similar to those used by them in their native country. Among these may be mentioned the paranzella net and lampara net, with which large catches are made. The different forms of apparatus will be described briefly in the order of their importance, based on the value of the catch. While pound nets rank as one of the important forms of apparatus used in the fisheries of Washington and Oregon, none was used in California in either 1915 or 1904.

Lines.—Lines rank first both in the quantity and value of the catch which, in 1915, amounted to 34,872,139 pounds, with a value to the fishermen of $681,825. Of this output 28,431,372 pounds were taken in the shore, and the remainder in the vessel fisheries. As compared with the last canvass by this Bureau for 1904, there is shown an increase of nearly 235 per cent in quantity and 149 per cent in value. This extraordinary increase may be traced mainly to the development of the albacore, or tuna, canning industry, which was in its infancy in 1904. A noticeable increase is also shown in the output of rockfishes and chinook salmon. The albacore fishery is confined almost exclusively to Los Angeles and San Diego Counties, the former furnishing more than 82 per cent of the State's catch. The line fisheries of Monterey County are of noticeable importance and are divided between the hand-line or trolling fishery for chinook salmon and the trawl-line fishery for rockfishes. Most of the other species are taken incidentally along with the two just named. Trolling for chinook salmon in Monterey Bay has developed into an important industry within recent years. Power boats are commonly used in this fishery. Two poles, one a little longer than the other, are generally set in sockets on each side of the boat, while two lines are set from the stern. As the boat moves slowly forward these lines are put out and in the above positions are clear of each other. To the other end of each pole is suspended a small tin can with a few pebbles in it. When a fish is hooked its struggles cause the pebbles in the can to rattle, and the fisherman then takes in the pole and pulls the fish in hand over hand.

The trolling in Santa Cruz and Mendocino Counties also is worthy of mention. The trolling, as well as most of the other fishing from these two counties, is followed from Santa Cruz and Fort Bragg, respectively.

Gill nets.—Gill nets rank next to lines in the value of their catch, the latter in 1915 amounting to 21,317,668 pounds, valued at $676,062, credited mostly to the shore fisheries. As compared with 1904, an increase of 4,280,643 pounds in quantity and $54,974 in value is shown, the increase in quantity being traced mainly to the shad fishery of the Sacramento River. This species, however, did not give a proportionately increased value to the fisheries. There was a decided decline in the catch of chinook salmon with gill nets, but this was made up by increased catches of other species. Notwithstanding its decline, chinook salmon was still the most valuable species taken with gill nets in California, followed in importance by the striped bass, barracuda, shad, sea bass, and smelt. About 32 species were taken with this apparatus, but those already mentioned

constituted the bulk of the catch. The Sacramento River, togethe with San Pablo and Suisun Bays, furnished the bulk of the gill-ne catch of the State. While drift gill nets were used in a small way a far up the Sacramento River as Corning, Tehama County, they cease to be important as an apparatus above Verona in Sutter County. Th length of drift gill nets varies from those measuring 170 yards eac used for chinook salmon along the upper portion of the river, t those measuring 450 yards each, used for shad near the mouth of th river. The nets used for chinook salmon and striped bass near th mouth of the river average about 385 and 420 yards, respectively In Suisun and San Pablo Bays, nets as long as 800 yards are used fo striped bass, shad, and chinook salmon. Those for chinook salmo are from 40 to 45 meshes deep; those for striped bass from 30 to 6 meshes, and those for shad from 60 to 65 meshes. The size of mes varies in the salmon net from 7½ inches to 9¾ inches; in the striped bass net it is commonly about 5½ inches; and in the shad net fro 5½ to 6½ inches, but more often of the latter size.

The bulk of the gill netting credited to Del Monte County was don in the Klamath River, from its mouth to a point 6 miles above. A cannery at Requa utilizes most of the catch. The chinook salmo run from March 1 to September 1, with a few in October, while th silver salmon run from September 20 to the last week in Octobe The nets on this river average 200 yards in length and 30 to 35 meshe deep. The mesh varies from 6½ to 9 inches, but more of the smalle size are used.

Gill nets constitute the most valuable apparatus used in Humbold County, a very large percentage of the catch being taken with them The Eel River is the only stream of any importance in the county Practically all of the fishing in this river is done between the mout and 3½ miles above. The drift gill nets used on the river averag about 150 yards in length, and from 28 to 32 meshes deep. Th mesh for chinook is 9½ to 9¾ inches, while that for silver salmon an steelhead is 6½ inches. The fishing is done from October 7 to Decem ber 7. The same fishermen in some instances fish in both the Kla math and Eel Rivers.

Paranzella nets.—Paranzella or trawl nets are used both in th vessel and shore fisheries of California, but the catch in the forme is much more important. The fishing is confined to the Pacific Ocea from San Francisco, Santa Cruz, and Los Angeles Counties, that fro the first-named county being much the more important. In 191 the total catch amounted to 9,707,373 pounds, valued at $193,368 as compared with 5,637,561 pounds, valued at $104,602, in 1904 Many species are taken, but sole and flounders constitute more tha 90 per cent of the catch.

The paranzella, a somewhat primitive style of net, was intro duced in California by Italian fishermen in 1877. It consists of a flat, triangular bag of webbing, doubtless developed from a beac seine or bag net, with a wide but low mouth. The net rapidly nar rows from the wide mouth to the cod end of the bag, which is s arranged that it can be unlaced to discharge the catch when it i hoisted aboard the boat. The nets are constructed of heavy cotto twine. The forward part of the bag is of about 4-inch mesh, th middle part still smaller, and the cod end of much heavier twine

has a 1½-inch mesh. The mouth of the net when fishing has a spread of about 50 feet.

When the nets were first introduced they were operated with small sailboats, were necessarily of small dimensions, and dragged within San Francisco Bay and in the shallow water alongshore just outside the harbor. Later, or about 1888, steam tugs, with larger nets were employed, and the San Francisco paranzella fishery was soon in the hands of a few companies, constituting the principal wholesale fish dealers of the city.

In fishing a paranzella the steamers work in pairs and follow parallel courses about one-half mile apart, each towing one end of the net. Occasionally two nets were towed by three steamers, the center one towing an end of two nets. The drags are made either with or against the current; otherwise the net would drift sidewise and not fish properly. Two drags are usually made each day, frequently only one, the duration of a drag being 1½ to 2 hours. A crew of 4 or 5 men is carried on one of the steamers, and from 10 to 14 on the other, the latter being the one on which the net is lifted. When a drag is completed the net is hauled in by steam winches and lifted aboard by means of a derrick. Frequently the weight of the fish is so great that some of them have to be removed with a long-handled dip net before the net is lifted aboard, to prevent tearing it. Several extra nets are always carried aboard the boat.

The fishing is practically all done outside the 3-mile limit and in from 25 to 55 fathoms of water. Of the two grounds most resorted to by San Francisco vessels one lies 4 to 8 miles southwest of Point Rizes and the other about 8 miles south of the lightship off the entrance to San Francisco Harbor. The catches are not so large during the winter, the supposition being that the fish have moved out into deeper water during the period of rough weather.

While steamers are used almost entirely from San Francisco, in Santa Cruz and Los Angeles Counties only gasoline boats are used.

Trammel nets.—The catch with trammel nets in 1915 amounted to 3,510,154 pounds, valued at $134,766, showing a decline in quantity since 1904 of 261,357 pounds, but an increase in value of $59,301. The catch was made up of flounders, barracuda, and perch, but flounders comprised 88 per cent of the total. The use of these nets is confined mainly to the counties in southern California, San Diego County furnishing the largest quantity. The fishing is all done in the Pacific Ocean, nearly nine-tenths of the catch being credited to the shore fisheries.

The trammel nets used in this State are similar in construction to those in general use elsewhere, consisting of three nets instead of one, as in a gill net. The two outer nets have a 23-inch mesh and hang about 12 feet deep. The inner web has a 9-inch mesh and hangs about 16 feet deep. The two outer nets are of No. 12 cotton twine and the middle one of No. 9. The nets are from 72 to 80 yards long, and about 20 are usually tied together and fished as one net. They are set at right angles but not immediately adjoining the shore. An anchor weighing 25 pounds and a buoy, usually a 4-gallon keg, are placed at each end of the net. The lead line, weighted with about 25 pounds of lead, rests on the bottom. The nets are set either during the day or night and ordinarily remain out about 24 hours before lifting. They are commonly set a short distance from shore in from

12 to 15 fathoms of water, but occasionally they are set as far o as 4 or 5 miles in 25 fathoms. The fishing is done at almost any tir during the year.

Pots and traps.—The catch with pots and traps in 1915 amount to 909,426 pounds, having a value to the fishermen of $131,11 More than 98 per cent of the output was spiny lobsters, the remai der consisting of a few perch, rock bass, sea bass, and octopi. Tl use of these forms of apparatus is confined to the more southe counties of the State. The lobster pots are set on the kelp be near the shore, where the lobsters seem to gather for protection du ing warm weather; but when it gets colder they move into deep water, and the fishermen follow them with their pots. The pots a made of laths, usually about 3 feet long, 30 to 32 inches wide at tl bottom, narrowing to about 12 inches at the top, and about 12 inch high. They are set singly, with a buoy line attached to each po in water varying in depth from 3 to 20 fathoms. When fishing the deeper water it is often necessary to use from 40 to 60 poun of ballast to a single pot.

Hoop nets.—With the exception of a few crawfish taken in a sma stream in Sonoma County, the use of hoop nets was confined e clusively to taking crabs, the catch of which in 1915 amounted 1,157,567 pounds, valued at $111,930, all of which were taken in th shore fisheries. Crabs are taken as far north as Del Monte Count but practically none were taken commercially south of San Francisc from which place and vicinity most of the fishing was done. Th nets are similar to those used in Washington. They are set in th Pacific Ocean, usually within a mile offshore, but a few are set a far as 9 miles out. It is customary to have an interval of 150 yar between the nets. Herring, perch, or shiners are used for bait an are placed in a small, brass-wire cage fastened to the center of th net. The hoops of the net are painted to prevent them from rustin and rotting the twine.

Lampara nets.—The total catch with lampara nets in 191 amounted to 10,989,512 pounds, valued at $106,906, of which squi contributed about 55 per cent and sardines nearly 30 per cent of th weight. The remainder of the catch was made up of 16 other specie Lampara nets were used in San Francisco, Monterey, Los Angele and Orange Counties only. This net is said to have originated i Italy and was introduced into California by fishermen from tha country. It is constructed somewhat on the principle of a com mon haul, or beach, seine, except that the lead line is shorter tha the cork line, which creates a bag or bunt in the back of the net f the collection of the fish. The average length of this net is abou 120 yards and the depth 35 to 50 feet. The bag, which is about 1 feet long, is made of No. 20–6 cable-laid twine, and the remainde of No. 6 cotton thread. The bunt has a 1-inch mesh, the next 5 feet of the net have a 4-inch mesh, the next 120 feet an 8-inch mes and the remainder an 18-inch mesh. A line, 15 fathoms long, No. 15 manila rope, is attached to each end of the net. The twin used, the size of mesh, and also the manner of construction diff according to the individual ideas of the fishermen.

A lampara net is always hauled into a boat instead of on the beac The fishing is usually done in shallow water, as it is desired that th lead line be on or close to the bottom. From three to five me

with one and sometimes two skiffs are necessary to operate the net. When operated with one boat, the method is as follows: When a school of fish is sighted one end of the net, with a buoy and sometimes an anchor attached, is thrown out. The boat is then rowed in a circle around the fish, the net in the meanwhile being let out as the boat moves. When the buoy or starting point is reached an anchor is thrown out from the side of the boat away from the net to prevent the latter from being interfered with by the boat. Some of the men then begin pulling in from the bow and others from the stern of the boat until the bag is alongside, when the fish are dipped out. The net is then overhauled and made ready for another layout. It is sometimes fished from two boats by first dropping the bag of the net overboard, then the boats, each with its share of the net, being rowed in opposite directions, until the boats meet after making a circle. The men in the boats then exchange ends of the net and anchor the boats, after which they begin pulling in, keeping the wings crossed as they pull, until the bag reaches the space between the two boats. It takes at least four men with two boats to haul the net in this manner, which is followed mostly by the Japanese in the lower part of California.

Seines.—The output with seines in 1915 amounted to 3,537,965 pounds, with a value to the fishermen of $98,394. Of this amount, 2,968,737 pounds were taken in the shore, and the remainder in the vessel, fisheries. As compared with 1904, there was a decrease of 551,446 pounds in quantity, but an increase of $5,030 in value. Seines were operated in 19 of the 27 counties of the State having fisheries, but sardines taken in the shore fisheries of Monterey County constituted more than 31 per cent of the total seine catch. Chinook salmon taken in the counties bordering on the Sacramento River and smelt taken mainly in the ocean are also worthy of mention. Besides those mentioned, 30 other species were taken with seines. The seines used in the vessel fisheries were mostly purse seines, and averaged about 528 yards each in length, while those in the shore fisheries were mostly haul seines and averaged only 132 yards each in length.

Fyke nets.—Fyke nets are fished only in five counties of the State, all located on the Sacramento River and its tributary, the San Joaquin River. The latter river was much the more important of the two. The total catch in 1915 amounted to 598,776 pounds, valued at $26,327, as compared with a catch in 1904 of 541,123 pounds, valued at $15,285, showing an increase both in quantity and value, but especially the latter. In both years the catch consisted mainly of catfish, though small quantities of five other species were taken. The fyke net commonly used has five hoops, the largest being 5 feet and the smallest 2 feet in diameter, the total length of the net being 10 feet. The bait, which in fishing for catfish commonly consists of salt shad, is placed in a small knit bag at the end of the fyke net.

Abalone outfit.—The output with abalone outfits in 1915 consisted of 24,026 pounds of live abalone, valued at $517; 730,974 pounds of abalone meat, valued at $16,830; 74,000 pounds of abalone shells valued at $1,890; and $1,240 worth of pearls and blisters, the total quantity amounting to 829,000 pounds, valued at $20,477, as compared with 833,678 pounds, valued at $10,873, in 1904. The tables show a very large decrease in abalone sold alive, but an increase in

abalone meat, as compared with 1904. There has been an increase i abalone shells, but a decrease in pearls sold. Los Angeles supporte an abalone industry in 1904, but laws passed since then have prac tically prohibited a continuation of the industry.

Kelp harvesters.—Kelp harvesters were employed in only thre counties—Los Angeles, San Diego, and Ventura. The total output o kelp in 1915 amounted to 5,000,000 pounds, having a value of $2,50(No comparison can be made with any previous report, as the industr has developed since the outbreak of the European war, when th importation of potash from Germany ceased.

Dredges, tongs, rakes, forks, etc.—These forms of apparatus were em ployed only in the shore fisheries, the catch consisting of clams, oys ters, mussels, turtles, and seaweed. The total value of these product in 1915 amounted to $210,436. As compared with the output o corresponding apparatus used in 1904, there was a decrease o $453,655 in value, this being due mainly to the decline in both th native and eastern oysters.

Miscellaneous apparatus.—Under this heading are included beam trawls, spears, dip nets, and nets for catching sea lion. The tota catch in 1915 with all of these forms of apparatus combined amounted to 365,125 pounds, with a value of $12,065. The output consisted of chinook salmon, surf fish, shrimp, and sea lion.

The beam trawls are used only in Alameda County, the output consisting entirely of shrimp, taken in San Francisco Bay. The total catch in 1915 amounted to 263,000 pounds, valued at $4,850. The beam trawls are ordinarily used from gasoline launches of about 6 horsepower and are similar in construction to those used in Washington, except that they are smaller. The beam is about 18 feet long, and the iron shoes upon which it rests raise it 18 inches above the bottom. The bag is made of flax twine knit by Chinese. The fishing is commonly done in about 2 fathoms of water.

The use of spears is confined to Shasta County, the catch of chinook salmon with this apparatus being unimportant.

Dip nets are used in Humboldt and Sonoma Counties, the catch in both counties consisting entirely of surf fish. The total output in 1915 amounted to 57,000 pounds, valued at $2,320. The fishing is done entirely in the ocean. The fisherman stands at the edge of the surf and holds his net under it as it is breaking, no boat being used. The net used in Humboldt County, when made to order, costs about $10. It is triangular in shape, two of the sides consisting of wooden strips 8 feet long connected at their outer ends by a string. The netting attached to this frame sags a little below it to hold the fish. A short distance from the point of intersection, and connecting the two strips of the frame, is nailed a short strip, which serves as a handle for the net.

IELD OF THE VESSEL FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS.

Apparatus and species.	Los Angeles.		San Diego.		San Francisco.	
ines:	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Albacore (or tuna)	25,000	$375				
Barracuda	158,700	6,045				
Bonito	18,020	515				
Mackerel	12,010	346				
Perch	5,790	115				
Salmon:[a]						
Chinook	66,000	3,330				
Chum	38,093	190				
Silver	12,330	370				
Sea bass	85,000	3,242				
Spanish mackerel	23,285	658				
Yellowtail	108,300	2,918				
Total	552,528	18,104				
ill nets:						
Barracuda	328,000	12,706				
Bonito	825	24				
Perch	1,500	30				
Mackerel	4,400	122				
Sea bass	7,900	291				
Smelt	4,650	244				
Spanish mackerel	32,100	925				
Total	379,375	14,342				
ots: Spiny lobsters	4,020	520	20,000	$2,630		
ines:						
Albacore (or tuna)	820,845	12,295	179,000	2,675		
Barracuda, salted			130,000	5,200		
Cod, salted					4,952,692	$161,695
Hake, salted			24,000	960		
Jewfish, salted			88,000	3,520		
Rockfishes	53,100	1,565	71,000	1,420		
Spanish mackerel			11,000	400		
Yellowtail, salted			69,000	2,760		
Cod tongues					7,400	370
Total	873,945	13,860	572,000	16,935	4,960,092	162,065
aranzella nets:						
Flounders	21,185	605			2,027,919	36,617
Hake					160,350	704
Kingfish					78,385	1,657
"Lingcod"					39,048	971
Pompano					559	84
Rockfishes					26,800	864
Sablefish					39,920	130
Sardines					125	2
Sea bass					11,325	671
Sharks					472	23
Skates					164,050	672
Sole					3,830,050	54,950
Tomcod					33,112	587
Octopus					227	18
Crabs					5,905	458
Total	21,185	605			6,418,247	98,408
ampara nets:						
Barracuda	15,000	585				
Kingfish	4,500	90				
Mackerel	3,200	82				
Spanish mackerel	7,000	200				
Yellowtail	15,000	420				
Total	44,700	1,377				
rammel nets: Flounders	251,500	8,485	81,500	2,403		
elp harvesters: Kelp	3,000,000	1,500	2,000,000	1,000		
Grand total	5,127,253	58,793	2,673,500	22,968	11,378,339	260,473

[a] The salmon were taken by a California vessel fishing in the Columbia River.

YIELD OF THE VESSEL FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES AND APPARATUS—Continued.

Apparatus and species.	Santa Cruz.		Ventura.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Seines:						
Albacore (or tuna)					25,000	$
Barracuda					158,700	6,
Bonito					18,020	
Kingfish			3,200	$64	3,200	
Mackerel					12,010	
Perch					5,790	
Salmon: a						
Chinook					66,000	3,
Chum					38,068	
Silver					12,330	
Sea bass					85,000	3,
Smelt			13,500	715	13,500	
Spanish mackerel					23,285	
Yellowtail					108,300	2,
Total			16,700	779	569,228	18,
Gill nets:						
Barracuda					328,000	12,
Bonito					825	
Perch					1,500	
Mackerel					4,400	
Sea bass					7,900	
Smelt					4,650	
Spanish mackerel					32,100	
Total					379,375	14,
Pots: Spiny lobsters			7,900	1,027	31,920	4,
Lines:						
Albacore (or tuna)			25,000	300	1,019,845	15,
Barracuda, salted					130,000	5,
Cod, salted					4,952,692	161,
Hake, salted					24,000	
Jewfish, salted					88,000	3,
Rockfishes			14,730	471	138,830	3,
Spanish mackerel					11,000	
Yellowtail, salted					69,000	2,
Cod tongues					7,400	
Total			34,730	771	6,440,767	193,
Paranzella nets:						
Flounders	158,800	$4,660			2,207,904	41,
Hake	7,600	76			167,950	
Kingfish	30,200	906			108,585	2,
"Lingcod"	8,800	264			47,848	1,
Pompano					559	
Rockfishes	9,800	294			36,600	1,
Sablefish	200	10			40,120	
Sardines					125	
Sea bass					11,325	
Sharks					472	
Skates	7,000	70			171,050	
Sole	339,400	8,485			4,169,450	63,
Tomcod	8,800	352			41,912	
Octopus	2,400	144			2,627	
Crabs	9,614	655			15,519	1,
Total	582,614	15,916			7,022,046	114,
Lampara nets:						
Barracuda					15,000	
Kingfish					4,500	
Mackerel					3,200	
Spanish mackerel					7,000	
Yellowtail					15,000	
Total					44,700	1,
Trammel nets: Flounders					333,000	10,
Kelp harvesters: Kelp					5,000,000	2,
Grand total	582,614	15,916	59,330	2,577	19,821,036	360,

Statistics of the Yield of the Shore Fisheries of California in 1915, by Counties, Species, and Apparatus.

BY SEINES.

Species.	Butte.		Colusa.		Contra Costa.		Del Norte.		Glenn.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
arp			2,300	$45	68,000	$1,020				
lounders					9,000	133				
erring: Fresh					4,500	22				
erch					10,500	340				
almon:										
Chinook	81,500	$6,520	44,000	3,360	600	18	49,420	$1,235	80,000	$6,000
Silver							15,552	233		
had roe			1,500	145						
iners					1,400	28				
melt					10,000	680				
triped bass	500	40	700	63					1,500	120
turgeon	600	40	2,030	135					3,000	310
turgeon roe	200	120	326	147					300	180
Total	82,800	6,720	50,856	3,895	104,000	2,241	64,972	1,468	84,800	6,610

Species.	Humboldt.		Marin.		Monterey.		Orange.		San Francisco.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
nchovies									32,800	$1,375
arracuda					34,000	$680				
lounders	1,315	$37	7,500	$150						
erring:										
Fresh	25,494	503	180,000	1,175						
Salted			50,000	1,000						
ingfish							18,500	$370	1,700	50
ullet							3,000	300		
erch	15,000	410	85,000	1,710					15,000	1,200
almon: Chinook	29	1								
ardines:										
Fresh					1,100,000	5,500			15,200	725
Salted			1,400	80						
iners			4,000	70					6,000	150
melt	15,524	674	13,600	775			226,000	11,300	1,000	45
triped bass			2,500	200						
urf fish			65,000	4,550						
urbot			600	70						
hite bait									51,250	2,050
quid					140,000	700				
Total	57,362	1,625	409,600	9,780	1,274,000	6,880	247,500	11,970	122,950	5,595

Species.	San Joaquin.		San Mateo.		Shasta.		Sonoma.		Sutter.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
arp	63,286	$1,474							9,802	$106
atfish	17,000	805							32,000	1,296
lounders							1,500	$60		
lardhead	4,674	146							1,500	110
lerring: Fresh							20,000	150		
erch							10,000	300		
ike, Sacramento	4,960	129								
almon: Chinook	7,000	360			19,000	$1,072				
ea bass	1,250	50								
had	40,000	600								
had roe	4,000	360								
melt			1,500	$60						
plit-tails	1,466	55							75	1
triped bass	5,301	449			1,247	142				
uckers	1,375	70							54	1
urf fish							2,000	140		
urtles	22	4								
Total	150,334	4,502	1,500	60	20,247	1,214	33,500	650	43,431	1,514

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, B COUNTIES, SPECIES, AND APPARATUS—Continued.

BY SEINES—Continued.

Species.	Tehama.		Ventura.		Yolo.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Anchovies							32,800	$
Barracuda							34,000	
Carp					8,300	$126	151,688	
Catfish	275	$11			984	58	50,259	
Flounders							19,315	
Hardhead					2,865	314	9,039	
Herring:								
Fresh							229,994	
Salted							50,000	
Kingfish			2,300	$46			22,500	
Mullet							3,000	
Perch			850	18			136,350	
Pike, Sacramento					39	1	4,999	
Salmon:								
Chinook	184,133	13,084					465,682	3
Silver							15,552	
Sardines:								
Fresh							1,115,200	
Salted							1,400	
Sea bass							1,250	
Shad	200	3					40,200	
Shad roe							5,500	
Shiners							11,400	
Smelt			20,000	1,060			287,624	1
Split-tails							1,541	
Striped bass	539	38			400	28	12,687	
Sturgeon							5,630	
Sturgeon roe							826	
Suckers							1,429	
Surf fish							67,000	
Turbot							600	
White bait							51,250	
Squid							140,000	
Turtles							22	
Total	185,147	13,136	23,150	1,124	12,588	527	2,968,737	7

BY GILL NETS.

Species.	Alameda.		Contra Costa.		Del Norte.		Glenn.		Humbold	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*V*
Carp			29,000	$510						
Flounders	5,000	$150	7,000	105					15,458	
Herring			2,500	12						
Perch	2,000	180	1,500	60						
Pike, Sacramento			4,600	90						
Salmon:										
Chinook	300	18	1,859,825	95,956	655,000	$14,767	1,300	$95	498,786	19
Silver					174,846	3,497			86,072	3
Shad, fresh			4,348,640	45,800						
Sharks	65,000	163								
Smelt	12,500	875	2,000	100					24,365	1
Steelhead trout									32,405	1
Stingray	605,000	1,512								
Striped bass	99,000	7,565	1,036,263	84,676						
Sturgeon									8,010	
Total	788,800	10,463	7,291,328	227,309	829,846	18,264	1,300	95	665,096	25

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY GILL NETS—Continued.

Species.	Los Angeles.		Marin.		Mendocino.		Monterey.		Orange.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Anchovies	12,585	$130								
Barracuda, fresh	565,960	22,032							38,300	$1,732
Bonito	270,687	7,842					2,000	$50	1,600	48
Flying fish	245	6								
Herring			30,000	$215						
Kingfish	120,891	2,617					23,000	575		
Mackerel, fresh	47,570	1,372							51,500	1,030
Perch	35,278	835	10,000	180			6,000	30	5,500	165
Pompano	14,002	1,400							850	85
Salmon:										
Chinook			6,900	330						
Silver					26,000	$1,040				
Sea bass	146,951	5,584	70,500	3,500			8,800	365	35,200	1,735
Sea trout	400	20								
Smelt	81,316	3,299	65,000	3,125			5,314	425		
Spanish mackerel	73,031	2,970								
Striped bass			23,400	1,865						
Surf fish			3,500	245						
Swordfish	360	8								
Turbot			700	85						
Yellowtail, fresh	162,998	4,539								
Crabs							17,210	129		
Total	1,532,274	52,654	210,000	9,545	26,000	1,040	62,324	1,574	132,950	4,795

Species.	Sacramento.		San Diego.		San Francisco.		San Joaquin.		San Luis Obispo.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Albacore or tuna			2,371	$76						
Barracuda:										
Fresh			1,362,441	39,957					3,000	$120
Salted			198,000	7,900						
Bonito			33,062	594						
Carp	3,000	$40			120,000	$2,400				
Flounders					200,000	600				
Herring					500,000	5,000				
Horse mackerel			295	6						
Kingfish			2,156	50	6,500	200				
Mackerel:										
Fresh			400	8						
Salted			6,450	259						
Perch			217	5	1,450	50				
Pompano			229	27						
Salmon: Chinook	214,346	12,441			136,000	7,500	193,409	$10,030		
Sardines					3,600	250				
Sea bass			261,703	8,351	240,000	12,000				
Sea trout			119	5						
Shad:										
Fresh	16,826	313			1,600,000	9,000	596,820	7,447		
Salted	10,000	125								
Roe	2,940	287					13,898	1,259		
Smelt			115,707	5,597	370,000	15,100			75,000	3,750
Spanish mackerel			9,034	181						
Striped bass	34,354	2,839			283,000	24,000	64,345	5,449		
Sturgeon	620	49					59	5		
Sturgeon roe							22	11		
Yellowtail:										
Fresh			212,645	3,389						
Salted			55,500	1,983						
Total	282,086	16,094	2,260,329	68,388	3,460,550	76,100	868,553	24,201	78,000	3,870

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY GILL NETS—Continued.

Species.	Santa Barbara.		Santa Cruz.		Solano.		Sonoma.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Barracuda, fresh	162,000	$6,210	5,780	$231				
Bonito	30,000	870						
Herring			890	19				
Kingfish	1,500	30						
Mackerel, fresh	5,000	145						
Perch	1,000	20	6,000	300				
Pike, Sacramento					25	$1		
Pompano			687	68				
Salmon: Chinook					1,179,244	60,524	6,000	
Sardines	1,000	20	21,931	220				
Sea bass	50,000	1,900	86,860	3,474				
Sea trout	2,000	80						
Shad, fresh			478	24	176,827	2,650		
Smelt	16,325	865	30,000	1,200				
Spanish mackerel	41,300	826						
Striped bass					208,544	17,787	2,000	
Sturgeon					2,367	181		
Sturgeon roe					427	250		
Yellowtail, fresh	3,150	88						
Crabs			223,859	15,262				
Total	313,275	11,054	376,485	20,798	1,567,434	81,393	8,000	

Species.	Sutter.		Tehama.		Yolo.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Albacore or tuna							2,371	
Anchovies							12,585	
Barracuda:								
Fresh							2,137,481	70
Salted							198,000	7
Bonito							337,349	9
Carp					1,000	$15	153,000	2
Flounders							227,458	1
Flying fish							245	
Herring							533,390	5
Horse mackerel							295	
Kingfish							154,047	3
Mackerel:								
Fresh							104,470	2
Salted							6,450	
Perch							68,945	1
Pike, Sacramento							4,625	
Pompano							15,768	1
Salmon:								
Chinook	3,071	$173	1,627	$81	88,560	4,760	4,844,368	226
Silver							286,918	7
Sardines							26,531	
Sea bass							900,014	36
Sea trout							2,519	
Shad:								
Fresh	1,245	36	10	1	64,962	1,108	6,805,808	66
Salted							10,000	
Roe	61	6			4,634	434	21,533	1
Sharks							65,000	
Smelt							797,527	35
Spanish mackerel							123,365	3
Steelhead trout							32,405	1
Stingray							605,000	1
Striped bass	5,744	407			12,511	883	1,769,161	145
Sturgeon			55	3	183	14	11,294	
Sturgeon roe							449	
Surf fish							3,500	
Swordfish							360	
Turbot							700	
Yellowtail:								
Fresh							378,793	8
Salted							55,500	1
Crabs							241,069	15
Total	10,121	622	1,692	85	171,850	7,214	20,938,293	661

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY HOOP NETS.

Species.	Del Norte.		Humboldt.		Marin.		San Francisco.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Crabs	26,667	$2,000	24,420	$1,022	168,600	$16,494	929,080	$91,514

Species.	San Mateo.		Sonoma.		Total	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Crabs	4,800	$600	4,000	$300	1,157,567	$111,930
Crawfish			550	265	550	265
Total	4,800	600	4,550	565	1,158,117	112,195

BY POTS AND TRAPS.

Species.	Los Angeles.		Orange.		San Diego.		Santa Barbara.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Perch	1,700	$34						
Rock bass	1,350	54						
Sea bass	7,984	304						
Spiny lobsters	197,074	19,895	16,100	$2,093	480,313	$82,096	158,300	$20,729
Total	208,108	20,287	16,100	2,093	480,313	82,096	158,300	20,729

Species.	Santa Cruz.		Ventura.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Perch					1,700	$34
Rock bass					1,350	54
Sea bass					7,984	304
Octopus	6,000	$600			6,000	600
Spiny lobsters			8,685	$1,129	860,472	125,942
Total	6,000	600	8,685	1,129	877,506	126,934

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY LINES.

Species.	Alameda.		Colusa.		Humboldt.		Los Angeles.		Marin.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Val*
Albacore (or tuna): Fresh							16,518,654	$247,928		
Barracuda: Fresh							36,657	1,362		
Bonito							61,051	1,771		
Carp			500	$35						
Flounders: Fresh					34,775	$1,366	56,700	4,659		
Hake							17,322	571		
Jewfish: Fresh							20,890	414		
"Lingcod": Fresh					2,609	104				
Mackerel							13,010	377		
Pike, Sacramento			400	20						
Rock bass: Fresh							123,367	4,932		
Rockfishes: Fresh					16,905	577	637,031	20,317	3,000	$
Salmon: Chinook, fresh					381	9				
Sculpin							6,613	263		
Sea bass							337	12		
Sea trout							64	3		
Sharks							2,500	50		
Skates							6,600	120		
Sheepshead							1,367	28		
Smelt	19,000	$1,300								
Sole							10,000	300	50	
Spanish mackerel							16,250	481		
Striped bass									1,000	
Yellowtail							106,764	2,969		
Total	19,000	1,300	900	55	54,670	2,056	17,634,577	286,557	4,050	

Species.	Mendocino.		Monterey.		Orange.		San Diego.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Albacore (or tuna): Fresh					6,000	$150	3,449,560	$51,
Salted							25,000	
Barracuda: Fresh					43,500	2,140	53,463	1,
Salted							2,000	
Bonito					1,350	40	9,400	
Flounders: Fresh	13,000	$590	51,000	$1,275	2,900	83	250	
Salted			9,500	475				
Hake					3,300	107		
Jewfish: Fresh			300	10	4,200	84	87,071	1,
Salted							50,000	1,
Kingfish			15,350	383				
"Lingcod:" Fresh	1,000	40	103,000	2,060				
Mackerel							10,405	
Rock bass: Fresh					53,500	1,337	489,450	10,
Salted							2,750	
Rockfishes: Fresh	35,000	1,750	1,306,816	41,818	141,280	4,235	663,464	15,
Sablefish			17,560	878				
Salmon: Chinook, fresh	80,500	4,190	1,694,660	67,786				
Chinook, salted	20,000	2,400						
Silver	500	20	70,000	2,800				
Sculpin					1,850	75		
Sea bass			4,560	182				
Sea trout					3,500	105		
Sheepshead							201	
Sole							679	
Spanish mackerel							40,000	
Yellowtail							125,253	1,
Total	150,000	8,990	3,272,746	117,667	261,380	8,356	5,008,946	84,

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY LINES—Continued.

Species.	San Francisco.		San Luis Obispo.		San Mateo.		Santa Barbara.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Hake							6,650	$219
Jewfish: Fresh							4,000	80
Kingfish							500	10
"Lingcod": Fresh	301,103	$7,750						
Rock bass: Fresh							4,000	160
Rockfish: Fresh	825,500	39,655	85,000	$3,400	18,000		24,000	768
Sole	18,858	377						
Octopus	18,682	1,555				$550		
Total	1,164,143	49,337	85,000	3,400	18,000	550	39,150	1,237

Species.	Santa Cruz.		Sonoma.		Ventura.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Albacore (or tuna):								
Fresh							19,974,214	$299,832
Salted							25,000	481
Barracuda:								
Fresh							133,620	4,666
Salted							2,000	80
Bonito							71,801	1,991
Carp							500	35
Flounders:								
Fresh					3,250	$96	161,875	8,079
Salted							9,500	475
Hake							27,272	897
Jewfish:								
Fresh							116,461	1,859
Salted							50,000	1,500
Kingfish	32,757	$982					48,607	1,375
"Lingcod:"								
Fresh	98,000	2,940	2,700	$120			508,412	13,014
Salted	3,500	175					3,500	175
Mackerel	113	6					23,528	591
Pike, Sacramento							400	20
Rock bass:								
Fresh							670,317	16,461
Salted							2,750	97
Rockfishes:								
Fresh	378,478	12,355	22,000	1,110	4,350	259	4,160,824	141,202
Salted	8,000	400					8,000	400
Sablefish	2,223	111					19,783	989
Salmon:								
Chinook, fresh	119,592	4,783	12,000	360			1,907,133	77,128
Chinook, salted							20,000	2,400
Silver	29,897	1,195					100,397	4,015
Sculpin	350	7					8,813	345
Sea bass							4,897	194
Sea trout							3,564	108
Sharks							2,500	50
Skates							6,000	120
Sheepshead							1,568	30
Smelt							19,000	1,300
Sole							29,587	698
Spanish mackerel							56,250	1,281
Striped bass	350	17	1,250	100			2,600	217
Yellowtail							232,017	4,534
Octopus							18,682	1,555
Total	673,260	21,971	37,950	1,690	7,600	355	28,431,372	588,194

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY DREDGES, TONGS, RAKES, FORKS, ETC.

Species.	Alameda.		Del Norte.		Humboldt.		Los Angeles.		Marin.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Clams:										
Hard					1,760	$427	296	$104	26,416	$7,0
Soft	21,250	$5,950			6,280	1,250			11,880	4,4
Oysters:										
Eastern, market					42	14			14,840	8,8
Native, market									8,435	6,5
Mussels	130	35	2,650	$180			4,820	578	120	
Turtles							184	9		
Total	21,380	5,985	2,650	180	8,082	1,691	5,300	691	61,691	26,8

Species.	Mendocino.		Monterey.		Orange.		San Francisco.		San Luis Obisp	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Clams:										
Hard			96	$25	800	$260			34,856	$9,1
Soft							23,000	$5,300		
Oysters:										
Eastern, market							360,892	156,745		
Mussels	3,500	$200	1,810	110			6,000	1,200		
Seaweed			3,799	190						
Total	3,500	200	5,705	325	800	260	389,892	163,245	34,856	9,1

Species.	San Mateo.		Santa Barbara.		Santa Cruz.		Sonoma.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Clams:										
Hard					1,032	$272	600	$275	65,856	$17,5
Soft	2,200	$700					2,550	485	67,160	18,1
Oysters:										
Eastern, market									375,774	165,5
Native, market									8,435	6,5
Mussels					210	15			19,240	2,3
Turtles									184	
Seaweed			3,000	$135					6,799	3
Total	2,200	700	3,000	135	1,242	287	3,150	760	543,448	210,4

BY LAMPARA NETS.

Species.	Los Angeles.		Monterey.		Orange.		San Francisco.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Albacore (or tuna)	2,760	$69							2,760	$
Anchovies:										
Fresh							36,000	$225	36,000	2
Salted			16,000	$1,600					16,000	1,6
Barracuda	268,597	9,476					5,000	200	273,597	9,6
Bonito	20,261	688							20,261	6
Croaker	3,150	65							3,150	
Herring			1,000	20					1,000	
Kingfish	209,864	6,197					5,200	150	215,064	6,3
Mackerel	94,291	2,732			12,000	$240			106,291	2,9
Pompano	1,688	168					1,335	200	3,023	3
Rock bass	133,617	5,345			90,000	2,250			223,617	7,5
Sardines	305,150	6,103	2,906,200	14,531	22,500	225	12,000	75	3,245,850	20,9
Sea bass	197,892	7,520					5,000	200	202,892	7,7
Smelt	11,771	625					3,000	150	14,771	7
Spanish mackerel	143,905	4,114							143,905	4,1
Whitebait							5,000	200	5,000	2
Yellowtail	286,806	8,030			73,500	2,205			360,306	10,2
Squid	21,325	426	6,000,000	30,000			50,000	1,500	6,071,325	31,9
Total	1,701,077	51,558	8,923,200	46,151	198,000	4,920	122,535	2,900	10,944,812	105,5

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY PARANZELLA NETS.

Species.	Los Angeles.		Santa Cruz.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Flounders	383,970	$13,063	588,135	$16,936	972,105	$29,999
Hake			26,030	260	26,030	260
Kingfish			99,500	2,985	99,500	2,985
"Lingcod"			14,600	438	14,600	438
Sablefish			4,600	230	4,600	230
Skate			600	6	600	6
Sole	9,692	291	1,553,200	43,830	1,562,892	44,121
Octopus			5,000	400	5,000	400
Total	393,662	13,354	2,291,665	65,085	2,685,327	78,439

BY TRAMMEL NETS.

Species.	Los Angeles.		Marin.		Orange.		San Diego.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Barracuda	182,248	$7,050						
Flounders	635,748	24,919			132,250	$6,308	2,100,908	$81,413
Perch			2,500	$75				
Total	817,996	31,969	2,500	75	132,250	6,308	2,100,908	81,413

Species.	Santa Barbara.		Ventura.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Barracuda					182,248	$7,050
Flounders	115,500	$3,855	8,000	$258	2,992,406	116,753
Perch					2,500	75
Total	115,500	3,855	8,000	258	3,177,154	123,878

BY FYKE NETS.

Species.	Colusa.		Sacramento.		San Joaquin.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Carp			40,201	$514		
Catfish	6,700	$264	91,646	3,888	311,787	$15,533
Hardhead			42,237	2,122		
Pike, Sacramento			4,887	171		
Split-tails			15,475	328		
Suckers			635	15		
Total	6,700	264	195,081	7,038	311,787	15,533

Species.	Sutter.		Yolo.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Carp	2,000	$25	3,426	$56	45,627	$595
Catfish	17,346	725	39,316	1,719	466,795	22,129
Hardhead	224	16	21,923	914	64,384	3,052
Pike, Sacramento	523	19	450	18	5,860	208
Split-tails					15,475	328
Suckers					635	15
Total	20,093	785	65,115	2,707	598,776	26,327

STATISTICS OF THE YIELD OF THE SHORE FISHERIES OF CALIFORNIA IN 1915, BY COUNTIES, SPECIES, AND APPARATUS—Continued.

BY ABALONE OUTFITS.

Species.	Marin.		Mendocino.		Monterey.		San Diego.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Abalone:								
Alive			3,035	$97				
Meat	4,550	$158	3,000	185	547,424	$10,939	57,000	$3,1
Shells	2,000	450					72,000	1,4
Pearls and blisters		40						
Total	6,550	648	6,035	282	547,424	10,939	129,000	4,6

Species.	Santa Cruz.		Sonoma.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Abalone:						
Alive	20,991	$420			24,026	$5
Meat			119,000	$2,380	730,974	16,8
Shells					74,000	1,8
Pearls and blisters				1,200		1,2
Total	20,991	420	119,000	3,580	829,000	20,4

BY MISCELLANEOUS APPARATUS.

Species.	Alameda.		Humboldt.		San Francisco.		Santa Barbara.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Valu*
Surf fish			20,000	$600				
Shrimp	263,000	$4,850			35,000	$700		
Sea lion							9,375	$4,1
Total	263,000	4,850	20,000	600	35,000	700	9,375	4,1

Species.	Shasta.		Sonoma.		Total.	
	Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*
Salmon: Chinook	750	$75			750	$
Surf fish			37,000	$1,720	57,000	2,3
Shrimp					298,000	5,5
Sea lion					9,375	4,1
Total	750	75	37,000	1,720	365,125	12,0

WHOLESALE FRESH-FISH TRADE.

San Francisco is by far the most important wholesale fresh-fis center in California. Large quantities of fresh fish are also handle by firms located in Los Angeles, Monterey, San Diego, and Sacra mento, but a considerable proportion of these fish eventually reac San Francisco, from which city many are shipped to adjoinin States to the east and north. In 1915 there were 64 wholesale fresh fish establishments in the State, valued at $687,156, with a cas capital of $202,500, in which 394 persons were engaged and $310,89 paid in wages.

FISHERY PRODUCTS PREPARED, EXCLUSIVE OF CANNING.

The preparation of various fishery products has an importan bearing on the fisheries of California. Squid, amounting to 1,200,00 pounds, were dried and sold for $51,000. The mild-cured product

in 1915 consisted of 1,761,300 pounds of chinook salmon, valued at $187,220, and 105,000 pounds of shad, valued at $5,250. Chinook salmon, amounting to 245,000 pounds, were pickled and sold for $26,950. The salt-fish products amounted to 5,023,982 pounds, with a value of $83,138, the greater part of which was shad. The smoking of fish was comparatively unimportant, the output being only 34,600 pounds, with a value of $4,203. These consisted of halibut, chinook salmon, albacore, herring, and sablefish in the order of their importance. Among other products prepared from fish and fish offal were 599 tons of poultry feed, valued at $29,360; 65,567 gallons of oil, valued at $19,548; and 396 tons of fertilizer, valued at $14,145.

For statistics of products prepared, exclusive of canning, in California in 1915, see table, page 54.

CANNING INDUSTRY.

In 1915 there were 21 establishments, valued at $1,443,613, engaged in the canning of various fishery products. The number of persons engaged was 2,676, and the wages paid amounted to $394,181. Among the more important species canned were albacore, or tuna, sardines, chinook and silver salmon, shad, shad roe, bonito, and yellowtail. The value of the tuna pack, however, far exceeds that of all the other products combined. The canning of tuna, bonito, and yellowtail is confined to Los Angeles and San Diego Counties. Sardines, shad, and shad roe were canned in Contra Costa County only by one firm. Salmon were packed in Contra Costa, Solano, and Monterey Counties. Considerable quantities of abalone were canned in San Diego and Monterey Counties. A few cases of rockfishes were canned in San Diego and Los Angeles Counties, and a small pack of mussels was put up in Del Norte County.

EXTENT OF THE CANNING INDUSTRY OF CALIFORNIA IN 1915.

Items.	Number.	Value.	Items.	Number.	Value.
Establishments	21	$1,443,613	Salmon—Continued.		
Cash capital	.....	253,727	Silver—		
Persons engaged	2,676	.....	1 pound tall.....cases..	290	$1,044
Wages paid	.....	394,181	1 pound flat.....do....	2,500	11,250
PRODUCTS.[a]			½ pound flat.....do....	788	4,097
			Albacore (tuna):		
			1 pound flat.....do....	131,764	647,003
Bonito:			½ pound flat.....do....	110,602	751,741
1 pound flat.....cases..	145	725	⅓ pound flat.....do....	6,045	45,340
½ pound flat.....do....	2,403	15,861	¼ pound flat.....do....	10,016	73,774
Salmon:			Yellowtail:		
Chinook—			1 pound flat.....do....	465	2,748
1 pound tall....do....	1,048	4,192	½ pound flat.....do....	1,177	8,661
1 pound flat....do....	15,994	85,201	Oysters (not cooked)...galls..	29,429	75,804
½ pound flat....do....	2,466	19,998	Miscellaneous.....cases..	60,718	357,129

[a] All cases are on a basis of 48 pounds each.