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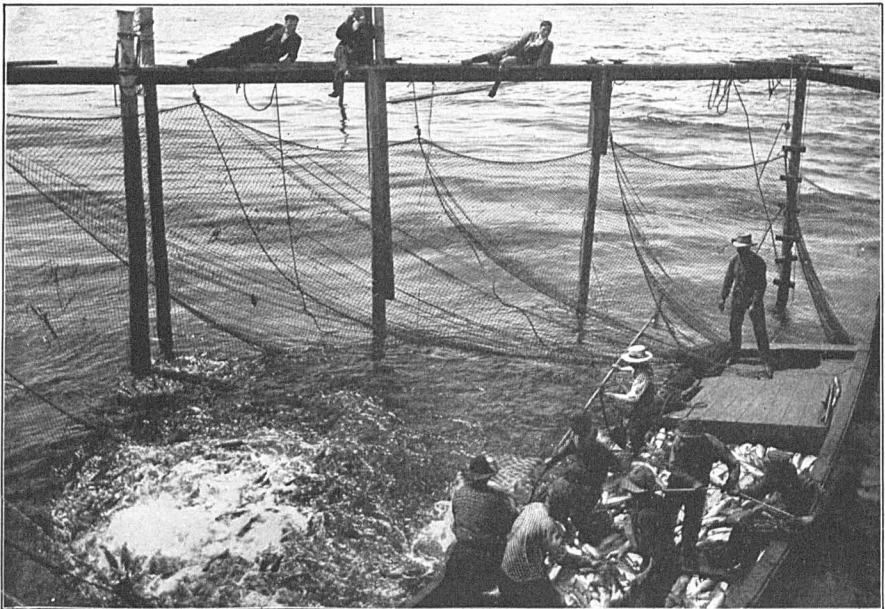
NOTES  
ON  
THE FISHERIES OF THE PACIFIC COAST IN 1899.  
BY  
WILLIAM A. WILCOX.

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DRYING ABALONE AT A CAMP OF JAPANESE FISHERMEN, NEAR SAN PEDRO, LOS ANGELES COUNTY, CAL.



FISHING A SALMON TRAP, PUGET SOUND.

## NOTES ON THE FISHERIES OF THE PACIFIC COAST IN 1899.

By WILLIAM A. WILCOX.

The present investigation of the Pacific coast fisheries of Washington, Oregon, and California is the fourth one the writer has made for the U. S. Fish Commission between 1889 and 1899. Favorable opportunities have therefore been afforded to observe the changes from time to time, and particularly the steady growth in the business, as indicated by capital, products, and number of employees, until, as here shown, it represents in capital \$12,873,379, in first value of products \$6,278,639, and in persons employed 19,528.

The Pacific coast fishery industries began with the taking of salmon for local use. Other fish than salmon were long disregarded, but subsequently have been marketed and will continue to be of more and more importance. Many places off the shores of Washington and Oregon in which fish are shown to be plentiful will be utilized much more in the future.

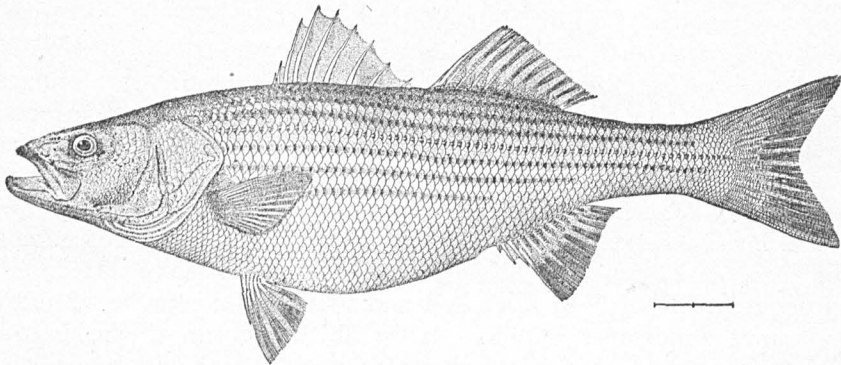
The wonderfully developed salmon-canning industry has given employment to many thousands of persons and furnishes a fine article of food that has found a market in every part of the globe. Fresh salmon has also largely increased in the quantity used and in the range of its distribution, being now quite reasonable in price not only in all the leading markets of the United States, but even in some of the countries of Europe.

The recent decrease in many valuable salmon fisheries is attributed chiefly to overfishing. This has, so far as possible, been remedied by artificial propagation, the benefits of which are being fully demonstrated and appreciated. If the salmon or other fisheries are to be sustained they must receive protection in every way. This applies to no particular section, but to any in which the fisheries are prosecuted for business or pleasure.

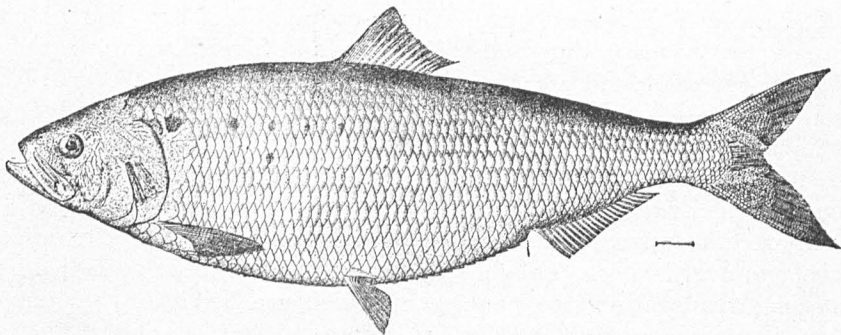
Several valuable species of fish hitherto unknown to Pacific waters (notably the shad and striped bass) have been introduced from Atlantic waters, and have found most favorable conditions for their existence, as shown by their remarkable increase. As the fine quality of these fish becomes generally known they add a yearly increase to the income of the fishermen at several places, but chiefly those of San Francisco

Bay and vicinity, where from \$75,000 to \$100,000 a year is realized by the fishermen from their capture. The general public appreciate the superior qualities of these fish, which they have at all seasons of the year, at prices lower than the same species bring at any of the markets of the Atlantic coast.

The general fresh-fish business shows a continual increase. At first supplying only a small local demand, it has grown to large proportions with the rapid growth of some sections and the improvement of transportation facilities, and has extended through the interior as far as Colorado, New Mexico, and Arizona and, to a limited extent, into Mexico.



STRIPED BASS, *Morone saxatilis*.



COMMON SHAD, *Alosa sapidissima*. Female.

The salt cod-fish business shows a slower yet steady growth, with possibilities for a largely increased demand from the more distant new possessions of the Government.

The whale fisheries of the Pacific are an exception to the general growth of the fisheries, showing but few changes from year to year. Sperm whales are said to be increasing in number, and little is now thought of a take of 1,000 barrels in a cruise of a few weeks, while formerly it took a year or longer to produce the same quantity. The low prices of oil and the expense and uncertainty of a catch of whales yielding the valuable whalebone in the more distant and dangerous

waters, near and in the Arctic Ocean, present few inducements for capital to engage in this old-time industry.

In making the several investigations noted, a large amount of statistical and general information was kindly furnished by the officials of the several railroads, express companies, and steamer lines, as well as by canners, fish-dealers, and fishermen. In collecting statistics for California, Messrs. A. B. Alexander and E. A. Tulian, of the U. S. Fish Commission, rendered valuable assistance.

The following table presents a comparison of the extent of the fisheries of the Pacific States for the years 1888, 1892, 1895, and 1899:

*Comparative summary of persons employed, capital invested, and value of products of the fisheries of Washington, Oregon, and California.*

States.	1888.	1892.	1895.	1899.
Persons employed:				
Washington.....	3,368	4,310	6,212	9,911
Oregon.....	3,619	4,332	6,323	5,643
California.....	4,684	5,403	4,770	3,974
Total.....	11,666	14,045	17,305	19,528
Capital invested:				
Washington.....	\$1,261,078	\$1,593,567	\$2,024,469	\$6,601,243
Oregon.....	1,859,299	2,272,351	2,637,412	3,497,643
California.....	2,081,950	2,526,746	2,612,298	2,774,493
Total.....	5,202,327	6,392,664	7,274,179	12,873,379
Value of products:				
Washington.....	\$810,226	\$931,568	\$1,402,433	\$2,871,438
Oregon.....	733,867	872,406	1,284,130	855,750
California.....	2,465,317	3,022,991	1,786,479	2,561,451
Total.....	4,009,510	4,826,964	4,473,048	6,278,639

The above table is interesting as showing the increase during the past few years and the changes in the relative positions of the fisheries of the three States, so far as capital and products are concerned.

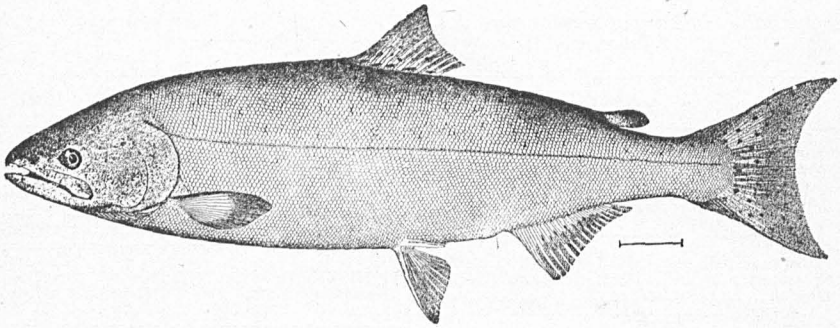
Within the past ten years Washington has advanced from the lowest to the highest rank in capital and products.

California has advanced in its general fish business, the decrease in persons employed resulting chiefly from the discontinuance of the seal fisheries, which at one time employed many men. California capital is also largely interested in the salmon fisheries of Alaska, which are not included in this report.

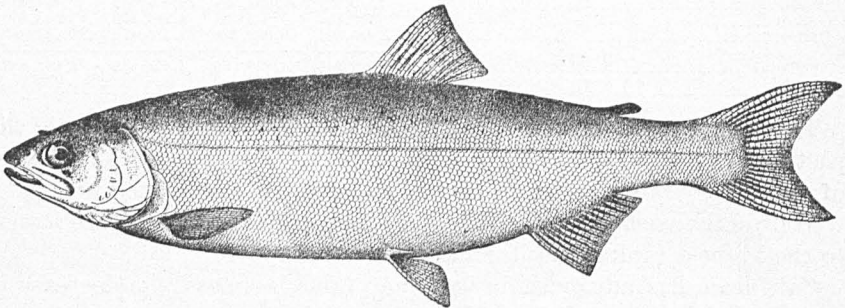
The Oregon fisheries are almost exclusively confined to the salmon industry of the Columbia and the smaller coast rivers. On account of a decreased run of salmon the products have fallen off, although there is an increase in the amount of capital invested in canneries and cold-storage plants.

The salmon fisheries were the first fisheries of the Pacific coast to be developed. At first comparatively unnoticed except by Indians and pioneers, who found in them a ready food supply, they later received the attention of capitalists, and more recently there has been a rush for favorable locations to establish salmon canneries, cold-storage

plants, and salteries in the Pacific coast States and Alaska. The tables of capital invested, persons employed, and cases of salmon canned in Washington, Oregon, and California between 1892 and 1899 will be found of interest in showing the large increase and the relative changes in amounts by species and localities. For this period the pack of the three States shows an increase of 768,232 cases of 48 one-pound cans each. The increase from 1895 to 1899 amounted to 461,734 cases, chiefly from the catch of bluebacks, of which as late as 1894 only 79,240 cases were canned, as against 523,615 cases in 1899.



CHINOOK, KING, OR QUINNAT SALMON (*Oncorhynchus tshawytscha*).



BLUEBACK OR RED SALMON (*Oncorhynchus nerka*).

The blueback, or sockeye, is one of the smallest in size and best in quality of the several species of salmon. Being rich in oil and bright red in color, it has been favorably received wherever introduced, both in this and foreign countries. This wonderful increase in the products of canned bluebacks has not resulted from any unusual abundance of fish, but from taking advantage of favorable circumstances that had long been neglected, by building a number of large canneries near the fishing-grounds of northwestern Washington, to which reports of the U. S. Fish Commission had previously called attention. It is remarkable that this valuable fishing-ground, accessible by rail

or water to the leading markets, should have so long remained almost unnoticed, while less desirable localities were being extensively developed in the distant Alaskan waters at much larger expense.

*Summary, by States, of the number of cases of salmon canned in 1892, 1893, 1894, 1895, and 1899.*

States.	Chinook.	Blue-back.	Silver.	Steel-head.	Dog.	Hump-back.	Total.
1892—Washington	134,253	19,441	28,708	26,045	29,411		238,758
Oregon	237,684	51,106	60,293	45,403			394,486
California	14,334		1,556				15,894
Total	386,271	70,547	90,551	72,348	29,411		649,128
1893—Washington	129,078	55,237	31,707	25,663	23,480	17,530	282,695
Oregon	176,024	23,074	62,913	39,568	9,230		310,804
California	26,456		500				26,956
Total	331,558	78,311	95,120	66,226	32,710	17,530	620,435
1894—Washington	156,549	53,717	32,118	23,209	33,952	9,049	308,594
Oregon	216,507	25,523	100,087	38,829	3,162		384,108
California	31,663		500				32,163
Total	404,719	79,240	132,705	62,038	37,114	9,049	724,865
1895—Washington	157,187	70,304	81,957	18,985	48,686	23,633	400,752
Oregon	316,284	12,854	138,981	30,693	27,027		525,839
California	28,635		400				29,035
Total	502,106	83,158	221,338	49,678	75,713	23,633	955,626
1899—Washington	95,147	503,950	145,139	2,258	42,656	252,733	1,041,883
Oregon	214,821	19,665	78,730	9,736	18,345		341,297
California	34,180						34,180
Total	344,148	523,615	223,869	11,994	61,001	252,733	1,417,360

*Table showing, by waters, the number of canneries and persons employed and the capital invested in the salmon industry of the Pacific States in 1899.*

States and waters.	Canneries.	Em- ployees.	Value of canneries.	Cash capi- tal.	Total invest- ment.
Washington:					
Straits of Fuca and Georgia and Puget Sound	19	3,461	\$700,714	\$1,961,977	\$2,662,691
Columbia River	5	282	112,000	205,000	317,000
Grays Harbor and Willapa Bay	4	135	35,000	78,000	113,000
Total	28	3,878	847,714	2,244,977	3,092,691
Oregon:					
Columbia River	12	1,088	693,768	945,000	1,638,768
Necanicum River	1	13	3,000		13,000
Nehalem River	1	27	25,000	20,000	45,000
Tillamook River	1	30	21,400	20,000	41,400
Nestucca River	1	17	10,030	10,000	20,000
Siletz River	1	84	9,000	8,000	17,000
Yaquina River	2	30	7,000	8,000	15,000
Alsea River	1	37	10,000	10,000	20,000
Siuslaw River	1	46	13,000	12,000	25,000
Umpqua River	2	50	22,000	16,000	38,000
Coos Bay	2	51	11,000	14,000	25,000
Coquille River	2	54	10,000	20,000	30,000
Rogue River	1	59	35,000	15,000	50,000
Total	28	1,536	870,168	1,108,000	1,978,168
California:					
Klamath River	1	30	10,000	8,000	18,000
Sacramento River	3	171	60,000	79,000	139,000
Total	4	201	70,000	82,000	152,000
Grand total	60	* 6,615	1,787,882	3,434,977	† 5,222,859

\* Includes 3,386 Chinese employed in the canneries.  
 † Value of vessels and fishing apparatus not included.

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Table showing, by waters, the salmon pack of Washington, Oregon, and California in 1899.

States and waters.	Canneries.	Chinook.		Blueback.		Silver.		Dog.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
Washington:									
Straits of Fuca and Georgia and Puget Sound.....	19	24,364	\$103,180	499,646	\$2,368,334	111,387	\$418,176	31,481	\$86,427
Columbia River.....	5	60,133	332,306	4,304	20,310	7,337	27,692	2,686	7,387
Grays Harbor and Willapa Bay.....	4	10,650	46,675					8,489	22,470
Total.....	28	95,147	482,161	503,950	2,388,644	146,139	544,824	42,656	116,284
Oregon:									
Columbia River.....	12	195,691	1,125,869	19,665	114,413	22,271	84,463	8,693	26,449
Necanicum River.....	1					2,200	9,350	1,000	2,460
Nehalem River.....	1	1,384	5,636			7,405	26,658	1,288	3,864
Tillamook River.....	1	2,180	8,720			8,889	14,096	5,121	15,363
Nestucca River.....	1	1,109	4,436			3,034	10,922	613	1,539
Siletz River.....	1	2,200	9,900			2,319	8,696	200	550
Yaquina River.....	2	316	1,422			3,234	12,127	1,300	3,575
Alsea River.....	1	2,150	9,138			5,010	19,038		
Siuslaw River.....	1	1,162	4,648			7,323	26,363	116	345
Umpqua River.....	2	925	3,660			7,576	27,006	116	345
Coos Bay.....	2	1,273	5,092			5,174	18,626		
Coquille River.....	2	950	3,800			7,550	28,500		
Rogue River.....	1	5,481	30,145			1,745	6,980		
Total.....	28	214,821	1,212,566	19,665	114,413	78,730	292,765	18,345	54,480
California:									
Sacramento River.....	1	1,600	8,800						
Klamath River.....	3	32,580	150,668						
Total.....	4	34,180	159,468						
Grand total.....	60	344,148	1,854,195	523,615	2,503,057	223,869	837,589	61,001	170,764

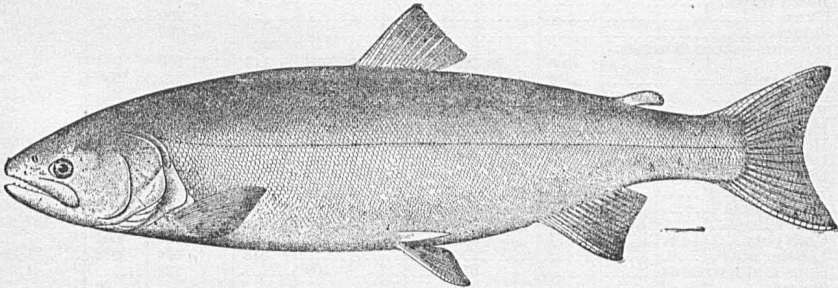
States and waters.	Humpback.		Steelhead.		Total.		Salmon utilized.	
	Cases.	Value.	Cases.	Value.	Cases.	Value.	Lbs.	Value.
Washington:								
Straits of Fuca and Georgia and Puget Sound.....	252,733	\$734,241			919,611	\$3,710,358	53,698,785	\$1,344,681
Columbia River.....			2,258	\$9,176	76,718	396,770	4,958,259	224,514
Grays Harbor and Willapa Bay.....					45,554	168,201	3,185,525	47,346
Total.....	252,733	734,241	2,258	9,175	1,041,883	4,275,329	61,842,569	1,616,541
Oregon:								
Columbia River.....			9,736	30,011	256,056	1,381,205	16,545,067	746,192
Necanicum River.....					3,200	11,800	295,000	6,446
Nehalem River.....					10,077	36,058	705,420	9,737
Tillamook River.....					11,190	38,119	753,605	7,577
Nestucca River.....					4,656	16,897	325,920	4,480
Siletz River.....					4,719	19,146	321,530	4,178
Yaquina River.....					4,850	17,124	339,500	3,548
Alsea River.....					7,160	28,176	601,200	6,339
Siuslaw River.....					8,600	31,356	781,700	12,040
Umpqua River.....					8,616	31,211	603,120	12,690
Coos Bay.....					6,447	23,718	458,790	7,364
Coquille River.....					8,500	32,300	593,750	10,018
Rogue River.....					7,226	37,125	469,690	4,697
Total.....			9,736	30,011	341,297	1,704,235	22,694,292	834,206
California:								
Sacramento River.....					1,600	8,800	2,119,065	61,748
Klamath River.....					32,580	150,668	112,000	2,100
Total.....					34,180	159,468	2,231,065	63,848
Grand total.....	252,733	734,241	11,994	39,186	1,417,360	6,139,032	86,767,926	2,514,596

A constantly growing demand for fresh fish has caused the building at several points of large cold-storage plants exclusively for freezing fish. The fish have a wide distribution throughout the United States

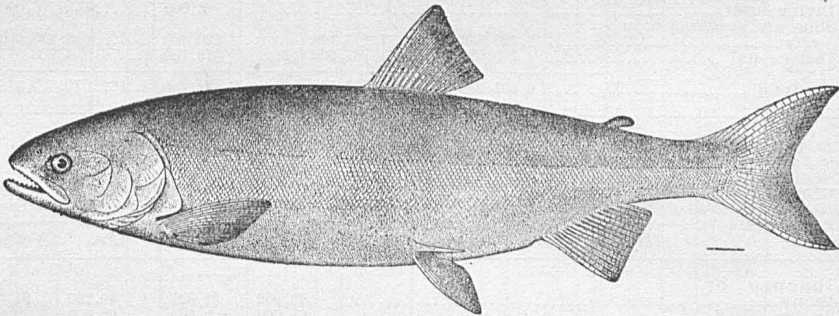


and large consignments of fresh salmon are also shipped to Europe. The shipments from Washington and Oregon by rail during 1899 amounted to 11,845,490 pounds, against 5,872,533 pounds in 1895.

The shipments in 1899 were as follows: From Portland, 3,473,159 pounds; from Astoria, 234,000 pounds; from Seattle, 5,173,257 pounds; from Tacoma, 1,811,300 pounds; from other points in Washington, 1,153,774 pounds; total, 11,845,490 pounds. The bulk of this large amount was salmon, with large shipments of halibut, most of which went east of the Rocky Mountains, a comparatively small proportion of the fresh fish of numerous species supplying a nearer home demand.



SILVER SALMON (*Oncorhynchus kisutch*).



DOG SALMON (*Oncorhynchus keta*).

In addition to the above, 2,190,601 pounds of pickled fish were shipped by rail from the Columbia River and Puget Sound.

#### GENERAL FISHERY STATISTICS OF THE PACIFIC STATES.

The three following tables show in detail the number of persons employed, the amount of capital invested, and the quantity and value of the products of the fisheries of the States of the Pacific coast in 1899:

*Persons employed in the fishing industry of the Pacific States in 1899.*

How engaged.	Washing- ton.	Oregon.	Califor- nia.	Total.
In vessel fisheries.....	544	75	942	1,561
In shore and boat fisheries.....	5,073	3,731	2,538	11,342
On shore, in canneries, etc.....	4,294	1,837	494	6,625
Total.....	9,911	5,643	3,974	19,528

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*Vessels, boats, apparatus, shore property, and cash capital employed in the fisheries of the Pacific States in 1899.*

Designation.	Washington.		Oregon.		California.		Total.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Vessels fishing	32	\$72,400	1	\$6,000	33	\$700,870	66	\$779,270
Tonnage	889		59		5,932		6,900	
Outfit		44,715		335		413,287		458,337
Vessels transporting	72	275,200	30	66,300	15	55,800	117	397,300
Tonnage	1,222		330		834		2,386	
Outfit		86,314		4,490		4,220		95,024
Boats	2,566	233,475	1,830	198,240	1,355	150,335	5,751	582,050
Pile-drivers	30	63,283					30	63,283
Apparatus—vessel fisheries:								
Dredges	1	100					1	100
Lines, trawl and hand		5,780		400		100		6,280
Beam trawl					4	1,400	4	1,400
Guns						200		200
Seines					2	2,000	2	2,000
Apparatus—shore fisheries:								
Seines	205	93,420	46	19,910	113	11,230	364	124,560
Found nets	540	1,562,660	65	45,200			605	1,597,860
Gill nets	1,900	119,591	2,067	297,700	1,979	166,841	5,946	584,132
Fyke nets	70	700	36	360	356	1,424	462	484
Paranzella nets					10	1,000	10	1,000
Hoop nets			2,325	1,829	1,537	3,074	3,862	4,903
Reef nets	20	600					20	600
Dip nets	55	140	12	60			67	200
Trammel nets					591	26,280	591	26,280
Shrimp nets					1,370	27,800	1,370	27,800
Fish wheels	29	66,300	47	121,300			76	187,600
Crab pots	574	685	80	80			654	765
Lobster pots					578	664	578	664
Guns and harpoons		675		100		322		1,097
Spears	88	255					88	255
Lines, trawl and hand		638				4,140		4,778
Dredges, tongs, forks, etc.		3,453		191		156		3,800
Diving outfit						3,000		3,000
Shore and accessory property		1,200,892		1,174,148		820,650		3,195,690
Cash capital		2,779,977		1,561,000		379,700		4,720,677
Total		6,601,243		3,497,643		2,774,493		12,873,379

*Products of the fisheries of the Pacific States in 1899.*

Species.	Washington.		Oregon.		California.		Total.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Albacore or tunny					49,202	\$1,327	49,202	\$1,327
Albacore, salted					65,000	2,600	65,000	2,600
Anchovies					6,826	177	6,826	177
Barracuda, fresh					957,420	23,220	957,420	23,220
Barracuda, salted					234,085	9,483	234,085	9,483
Black cod	163,500	\$4,475					163,500	4,475
Bonito, fresh					50,737	1,133	50,737	1,133
Bonito, salted					69,000	2,760	69,000	2,760
Carp					283,514	2,400	283,514	2,400
Cat fish	105,700	2,114	64,300	\$1,087	465,911	12,734	625,911	15,935
Cod, salted	930,000	23,250			5,917,131	178,054	6,847,131	201,304
Croakers					40,919	1,123	40,919	1,123
Cultus-cod	91,000	1,530			147,690	3,298	238,690	4,828
Flounders, fresh	28,000	660	3,522	53	4,675,215	90,929	4,706,737	91,542
Flounders, salted					20,090	1,104	20,090	1,104
Halibut	6,860,640	191,220	17,000	1,360			6,877,640	192,580
Hardhead					185,882	5,840	185,882	5,840
Herring, fresh	424,000	2,820	19,120	347	1,620,478	17,167	2,063,598	20,334
Herring, salted					16,589	516	16,589	516
Jew-fish, fresh					36,000	751	36,000	751
Jew-fish, salted					30,000	1,200	30,000	1,200
King-fish					127,198	4,488	127,198	4,488
Mackerel, fresh					139,666	5,855	139,666	5,855
Mackerel, salted					14,000	600	14,000	600
Mullet					22,000	610	22,000	610
Perch, fresh	43,000	770	6,360	95	429,485	10,657	478,845	11,522
Perch, salted					3,000	120	3,000	120
Pike					16,005	639	16,005	639
Pompano					13,135	4,457	13,135	4,457
Rock-fish, fresh	72,000	1,440			1,177,980	35,955	1,249,980	37,395
Rock-fish, salted					54,830	2,231	54,830	2,231

Products of the fisheries of the Pacific States in 1899—Continued.

Species.	Washington.		Oregon.		California.		Total.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Salmon:								
Blueback, fresh	41,931,194	\$1,307,514	579,183	\$21,293	21,600	\$755	42,531,977	\$1,329,562
Blueback, salted	70,000	2,801					70,000	2,801
Chinook, fresh	10,702,189	387,120	13,744,810	659,213	7,084,885	255,249	31,631,884	1,301,582
Chinook, salted	118,220	5,911	2,400	75	3,000	210	123,620	6,196
Dog, fresh	6,522,629	109,940	789,615	3,948			7,312,244	113,888
Dog, salted	22,302	446					22,302	446
Humpback, fresh	18,579,907	133,059					18,579,907	133,059
Humpback, salted	1,266,093	31,653					1,266,093	31,653
Silver, fresh	20,606,686	364,287	5,154,375	97,281	60,160	2,105	25,821,221	463,673
Silver, salted	21,000	630					21,000	630
Steelhead	1,507,465	69,242	1,103,522	48,014	113,600	3,876	2,724,587	121,132
Salmon trout	44,000	3,080					44,000	3,080
Sardines					2,383,000	17,790	2,383,000	17,790
Sea bass, fresh	5,000	150			14,000	19,952	19,952	20,102
Sea bass, salted					50,068	540	50,068	540
Sea trout					1,459	1,459	1,459	1,459
Shad	85,000	1,275	32,000	320	1,137,801	14,303	1,254,801	15,898
Smelt	937,000	9,810	28,000	340	1,315,249	58,064	2,280,249	68,214
Striped bass					1,234,320	61,814	1,234,320	61,814
Sturgeon	89,685	3,907			205,659	11,426	295,344	15,333
Split-tail					131,926	2,639	131,926	2,639
Sculpin					3,000	75	3,000	75
Sole					32,245	646	32,245	645
Surf-fish					116,290	2,576	116,290	2,576
Tomcod					375,538	6,882	375,538	6,882
White-fish					58,010	1,169	58,010	1,169
Yellow-fin					24,000	430	24,000	430
Yellow-tail, fresh					75,544	1,513	75,544	1,513
Yellow-tail, salted					129,100	5,164	129,100	5,164
Abalone meat					369,411	22,813	369,411	22,813
Abalone shells					625,453	9,743	625,453	9,743
Clams	a 3,131,325	23,248	b 979,290	9,434	c 2,170,934	31,045	d 6,281,549	63,727
Oysters, Eastern					e 25,200,000	792,000	f 25,200,000	792,000
Oysters, native	e 5,901,320	174,547	f 59,100	1,625	g 3,600,000	75,000	h 9,560,420	251,192
Mussels	19,200	240			364,076	3,637	383,276	3,877
Crabs	274,696	11,119	110,604	2,615	3,676,680	85,784	4,061,980	99,518
Spiny lobsters					606,713	14,198	606,713	14,198
Shrimp, dried					698,625	69,862	698,625	69,862
Shrimp in shell	19,600	1,960			903,375	36,135	922,975	38,095
Shrimp shells					2,446,186	4,889	2,446,186	4,889
Squid, dried					622,740	18,682	622,740	18,682
Frogs					20,687	20,638	20,687	20,638
Terrapin					107,869	10,376	107,869	10,376
Whalebone					207,892	436,272	207,892	436,272
Whale oil	i 15,000	300			j 607,800	20,191	k 522,300	20,491
Sea-lion oil			750	35	5,250	210	6,000	245
Sea-lion pelts			18,000	720	13,000	612	31,000	1,332
Sea-lion trimmings				135		815		450
Sea lions, alive					m 7,880	920	m 7,880	920
Sea-otter pelts						1,000		1,000
Scallops					3,939	738	3,939	738
Algae					35,824	896	35,824	896
Crawfish			116,400	7,760			116,400	7,760
Fur-seal pelts	375	1,000					375	1,000
Other products					101,396	5,417	101,396	5,417
Total	120,587,726	2,871,438	22,818,411	855,750	74,659,019	2,551,461	217,965,156	6,278,639

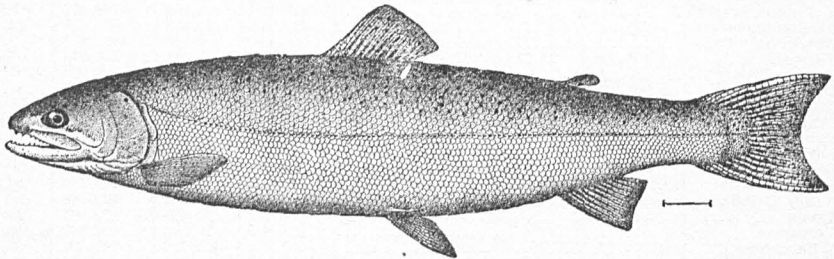
a 48,174 bushels.  
 b 15,066 bushels.  
 c 32,629 bushels.  
 d 95,799 bushels.  
 e 98,355 bushels.

f 985 bushels.  
 g 60,000 bushels.  
 h 158,340 bushels.  
 i 42,000 gallons.  
 j 67,628 gallons.

k 69,628 gallons.  
 l 300,000 bushels.  
 m 49 sea lions, alive.

## FISHERIES OF WASHINGTON.

The remarkable growth in the fisheries of Washington between 1895 and 1899 has probably never been exceeded in so short a time in any section of the country. The capital invested has increased from \$2,024,469 to \$6,601,243, the value of products to the producer from \$1,402,433 to \$2,871,438, and the employees from 6,212 to 9,911. By far the largest portion of this increase has been in the catch and canning of salmon, the increase in canneries being from 17 in 1895 to 28 in 1899, the new canneries having more than double the capacity of the former ones. The halibut fishery has increased from 1,714,315 pounds in 1895 to 6,860,640 pounds in 1899, and the oyster fishery, in value of products, from \$109,232 to \$174,567. With the exception of the now prohibited fur-seal fishery, all branches of the fishing business have been prosperous and show a gain in products, the aggregate gain in pounds being from 59,079,527 in 1895 to 120,587,726 in 1899; and this large increase has been met by a constant demand, at prices encouraging to the producer and reasonable for the consumer.

STEELHEAD (*Salmo gairdneri*).

The three following tables show the apparatus and capital, the number of persons employed, and the products of the fisheries of the State of Washington in 1899:

Table of apparatus and capital.

Items.	No.	Value.	Items.	No.	Value.
Vessels fishing.....	32	\$72,400	Apparatus—shore fisheries—continued.		
Tonnage.....	889		Reef nets.....	20	\$600
Outfit.....		44,715	Dip nets.....	55	140
Vessels transporting.....	72	275,200	Crab pots.....	574	685
Tonnage.....	1,222		Wheels.....	29	66,300
Outfit.....		86,314	Spears.....	88	255
Boats.....	2,566	233,475	Lines—trawl and hand.....		638
Pile-drivers.....	30	63,283	Harpoons.....		675
Apparatus—vessel fisheries:			Dredges, tongs, rakes, etc.....		3,453
Dredges.....	1	100	Shore and accessory property.....		1,200,892
Lines, trawl and hand.....		5,780	Cash capital.....		2,779,977
Apparatus—shore fisheries:			Total.....		6,601,243
Seines.....	205	93,420			
Gill nets.....	1,900	119,591			
Pound nets.....	540	1,552,650			
Fyke nets.....	70	700			

Table of persons employed.

How engaged.	No.
On vessels fishing.....	243
On vessels transporting.....	301
In shore fisheries.....	5, 073
On shore, in canneries, etc.....	4, 294
Total.....	9, 911

Table of products.

Species.	Lbs.	Value.	Species.	Lbs.	Value.
Black cod.....	163, 500	\$4, 475	Salmon—continued.		
Cat-fish.....	105, 700	2, 114	Silver, fresh.....	20, 606, 686	\$364, 287
Cod, salted.....	930, 000	23, 250	Silver, salted.....	21, 000	630
Cultus-cod.....	91, 000	1, 530	Steelhead.....	1, 507, 465	69, 242
Flounders.....	28, 000	660	Salmon trout.....	44, 000	3, 080
Hallbut.....	6, 860, 640	191, 220	Sea bass.....	5, 000	150
Herring.....	424, 000	2, 820	Shad.....	85, 000	1, 275
Perch.....	43, 000	770	Smelt.....	937, 000	9, 810
Rock-fish.....	72, 000	1, 440	Sturgeon.....	89, 685	3, 907
Salmon:			Oysters.....	* 5, 901, 320	174, 567
Blueback, fresh.....	41, 931, 194	1, 307, 514	Clams.....	† 3, 131, 325	23, 248
Blueback, salted.....	70, 000	2, 801	Mussels.....	19, 200	240
Chinook, fresh.....	10, 702, 189	387, 120	Crabs.....	274, 696	11, 119
Chinook, salted.....	118, 220	5, 911	Shrimp.....	19, 600	1, 960
Dog, fresh.....	6, 522, 629	109, 940	Fur-seal pelts.....	375	1, 000
Dog, salted.....	22, 302	446	Whale oil.....	15, 000	300
Humpback, fresh.....	18, 579, 907	133, 059			
Humpback, salted.....	1, 266, 093	31, 653	Total.....	120, 587, 726	2, 871, 438

\* 98,355 bushels.

† 48,174 bushels.

COUNTIES AND FISHING WATERS.

The State of Washington is much favored in its numerous waterways of both fresh and salt water. Throughout the interior there are many small streams and lakes of considerable size, well supplied with trout and other fine fish. Some of these waters are favorite resorts for sportsmen, while many are isolated and seldom visited, except by the few natives residing in the vicinity.

The commercial fisheries up to the present time have been confined to fishing in 19 of the 34 counties of the State. These 19 counties border the Pacific or its arms that are near the coast, the Washington side of the Columbia River being the only exception, and on that stream the bulk of the fishing has been near the coast.

With the decline in the salmon fisheries of the Columbia River more attention has been given to the waters of the northwestern portion of the State, whose fisheries show a remarkable growth within the past few years. These waters, which in 1899 produced nearly one-third of the salmon catch of the world, are generally known as Puget Sound, although this also embraces Admiralty Inlet and portions of the Straits of Juan de Fuca and of the Gulf of Georgia. Although the salmon is by far the most important, many other species of fish are taken all through the year, forming important items in the fish products of the State.

Besides the waters of the State already noticed those of and near Grays Harbor and Willapa Bay have for years furnished a large supply of salmon to canners and the fresh-fish market. Just outside of the harbors, along the coast bordering Chehalis and Pacific counties, fine food-fish of numerous species are known to be abundant, but as yet are unsought by fishermen.

The business of 1899 is here shown by counties, giving the persons employed, capital invested, products in pounds, and their value to the fishermen, together with the amounts taken by the various appliances.

Table showing, by counties, the number of persons employed in the fisheries of Washington in 1899.

Counties.	On ves- sels fishng.	On ves- sels trans- portng.	In shore fisheries.	On shore, in can- neries, etc.	Total.
Chehalis		3	260	50	313
Clallam		14	236	145	395
Clarke			38		38
Cowlitz		2	211		213
Island			31		31
Jefferson	24		31		55
King	136	33	724	401	1,294
Kitsap	3		61		64
Klickitat			16		16
Mason			41		41
Pacific		24	867	162	1,053
Pierce	59		262	41	362
San Juan			216	225	441
Skagit	21	37	262	656	976
Skamania			71	2	73
Snohomish			64		64
Thurston			87	39	126
Wahkiakum		9	587	205	801
Whatcom		179	1,008	2,368	3,555
Total	243	301	5,073	4,294	9,911

Table showing, by counties, the vessels, boats, apparatus, and property employed in the fisheries of Washington in 1899.

Counties.	Vessels fishing.				Vessels transporting.				Boats.		Pile-drivers.	
	No.	Ton- nage.	Value.	Value of outfit.	No.	Ton- nage.	Value.	Value of outfit.	No.	Value.	No.	Value.
Chehalis					1	9	\$2,500	\$200	170	\$6,730		
Clallam					2	23	13,500	3,200	176	7,920		
Clarke									17	825		
Cowlitz					1	5	1,000	200	117	9,455		
Jefferson	3	72	\$8,000	\$4,740					4	120		
King	23	582	39,800	19,960	8	187	35,400	16,450	196	28,490		
Kitsap	1	12	400	380					30	1,500		
Klickitat									4	100		
Mason									32	640		
Pacific					12	81	6,800		596	44,520	5	\$5,000
Pierce	4	81	19,200	17,920					96	4,590		
San Juan									70	13,420		
Skagit	1	142	5,000	1,715	7	191	40,000	11,889	228	18,855	7	15,083
Skamania									16	620		
Snohomish									45	900		
Thurston									42	840		
Wahkiakum					2	44	8,000		242	29,745		
Whatcom					39	682	168,000	54,375	485	64,205	18	43,200
Total	32	889	72,400	44,715	72	1,222	275,200	86,314	2,566	233,475	30	63,283

Table showing, by counties, the vessels, boats, apparatus, and property employed in the fisheries of Washington in 1899—Continued.

Counties.	Apparatus—vessel fisheries.			Apparatus—shore fisheries.							
	Dredges.		Value of lines, trawl and hand.	Seines.			Gill nets.			Pound nets.	
	No.	Value.		No.	Length, feet.	Value.	No.	Length, feet.	Value.	No.	Value.
Chehalis.....				17	11,760	\$4,965	201	75,729	\$11,854	5	\$2,500
Clallam.....				2	2,400	800	2	3,600	500	1	3,000
Clarke.....				3	3,600	1,200	3	3,600	600		
Cowlitz.....				3	3,600	1,200	86	61,080	9,800	29	14,500
Island.....										6	33,000
Jefferson.....			\$800	16	3,060	875				1	10,000
King.....	1	\$100	3,570	78	89,040	48,250	78	88,440	8,782	1	3,200
Kitsap.....			100							4	12,500
Klickitat.....						1	360	30			
Pacific.....				6	4,800	1,600	108	79,020	8,000	340	228,750
Pierce.....			1,250	30	22,800	8,100	73	12,840	1,945	1	10,000
San Juan.....										36	347,500
Skagit.....			60	17	13,850	8,580	650	155,400	21,225	3	15,000
Skamania.....						21	14,920	3,120		2	800
Snohomish.....						362	29,499	3,685			
Wahkiakum.....				15	23,700	5,850	193	298,200	45,850	29	19,400
Whatcom.....				21	17,580	13,200	122	34,299	4,200	82	852,500
Total.....	1	100	5,780	205	192,590	93,420	1,900	856,987	119,591	540	1,552,650

Counties.	Apparatus—shore fisheries—continued.											
	Fyke nets.		Reef nets.		Dip nets.		Crab pots.		Fish-wheels.		Spears.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Chehalis.....							30	\$45			80	\$240
Clallam.....							520	520			3	5
Clarke.....	60	\$600							1	\$500		
Cowlitz.....	10	100			25	\$38						
Klickitat.....					18	90			8	11,900		
Skagit.....											5	10
Skamania.....									20	53,900		
Whatcom.....			20	\$600	12	12	24	120				
Total.....	70	700	20	600	55	140	574	685	29	66,300	88	255

Counties.	Value of dredges, tongs, rakes, hoes, etc.	Value of lines, hand and trawl.	Value of harpoons.	Value of shore and accessory property.	Cash capital.	Total investment.
Chehalis.....		\$20		\$10,800	\$30,000	\$64,880
Clallam.....	\$80	398	\$675	43,000	65,000	142,763
Clarke.....				1,175		4,500
Cowlitz.....				2,500		38,793
Island.....						33,000
Jefferson.....		9	15	200		24,759
King.....				222,000	327,000	753,002
Kitsap.....		50				14,930
Klickitat.....			30			12,150
Mason.....		105				745
Pacific.....		2,995		53,100	131,000	484,765
Pierce.....		74	150	22,500	45,000	130,729
San Juan.....				30,000	50,000	440,920
Skagit.....		20	5	144,411	373,500	655,356
Skamania.....			20			58,460
Snohomish.....				900		6,485
Thurston.....		120		11,678	11,300	23,988
Wahkiakum.....				99,675	145,000	368,520
Whatcom.....				568,950	1,599,177	3,358,539
Total.....	3,453	638	675	1,200,892	2,779,977	6,601,243

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Table showing, by counties and species, the yield of the fisheries of Washington in 1899.

Species.	Chehalis.		Clallam.		Clarke.		Cowlitz.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Black-cod.....			30,000	\$600				
Cat-fish.....					90,600	\$1,812	15,100	\$302
Cultus-cod.....			37,000	700				
Halibut.....			341,640	4,340				
Herring.....			4,000	20				
Rock-fish.....			5,000	100				
Salmon:								
Blueback, fresh.....			360,455	15,643	29,214	877	29,000	1,160
Chinook, fresh.....	918,205	\$16,438	10,000	300	69,380	3,071	121,481	5,499
Dog, fresh.....	486,374	2,021	98,756	914				
Humpback, fresh.....			502,275	2,265				
Silver, fresh.....	1,866,797	28,860	596,993	9,634	317	9	137,005	4,105
Steelhead.....	242,000	10,183			11,318	348	63,239	2,704
Shad.....							60,000	900
Smelt.....			2,000	40			482,000	2,410
Sturgeon.....	24,000	900						
Clams.....			484,500	2,288				
Crabs.....	5,376	224	182,920	8,495				
Fur-seal pelts*.....	375	1,000						
Whale oil.....			15,000	300				
Total.....	3,538,127	59,626	2,669,539	45,569	200,859	6,117	907,825	17,080

Species.	Island.		Jefferson.		King.		Kitsap.		Klickitat.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Black-cod.....			25,000	\$750	66,500	\$2,116	1,000	\$30		
Cod, salted.....					550,000	13,750				
Cultus-cod.....			4,000	80						
Flounders.....					20,000	400				
Halibut.....			733,000	17,115	3,346,690	81,165	75,000	1,875		
Herring.....			60,000	500	30,000	600				
Perch.....					25,000	500				
Rock-fish.....					10,000	200				
Salmon:										
Blueback, fresh.....	979,730	\$29,440	211,171	6,378	3,869,000	149,820			10,296	\$309
Blueback, salted.....	2,056	82	1,920	77						
Chinook, fresh.....	651,721	13,271	21,658	676	39,560	1,342			75,973	3,039
Chinook, salted.....	4,920	216	3,950	198						
Dog, fresh.....	16,022	360	12,482	314	2,959,351	64,801	405,079	4,238		
Dog, salted.....	2,100	42								
Humpback, fresh.....	595,942	3,043	150,195	808	680,000	3,700				
Humpback, salted.....	37,230	931	32,940	824						
Silver, fresh.....	110,593	1,879	47,361	917	7,704,952	116,772	616,000	9,240	8,500	255
Steelhead.....	2,412	121	2,150	107	218,000	11,260			16,414	493
Smelt.....			3,000	60	70,000	1,500				
Sturgeon.....					13,333	500			44,078	1,905
Clams.....			18,000	75			1,024,800	15,540		
Mussels.....							19,200	240		
Shrimp.....					15,600	1,560				
Total.....	2,402,796	49,415	1,316,827	28,879	19,617,296	449,988	3,041,079	31,163	155,261	6,001

Species.	Skamania.		Snohomish.		Thurston.		Wahkiakum.		Whatcom.	
	Lbs.	Value.	Lbs.	Val.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Herring.....									140,000	\$700
Salmon:										
Blueback, fresh.....	532,600	\$19,083					115,169	\$4,155	25,536,434	768,110
Blueback, salted.....									46,320	1,813
Chinook, fresh.....	722,614	34,301	59,009	\$1,150			2,644,961	127,247	1,430,383	81,161
Chinook, salted.....									76,900	3,795
Dog, fresh.....	5,426	27	24,930	226			146,050	979	493,974	9,352
Dog, salted.....									14,602	292
Humpback, fresh.....			8,632	43					11,392,915	91,940
Humpback, salted.....									819,060	20,476
Silver, fresh.....	9,357	234	701,480	11,817			470,098	16,453	2,935,535	49,776
Silver, salted.....									16,500	485
Steelhead.....	168,161	6,049	89,118	3,397			70,824	2,125	67,986	3,325
Shad.....							25,000	375		
Smelt.....							20,000	100	20,000	200
Sturgeon.....	7,554	586	720	16						
Oysters.....					1,680,000	\$45,500			120,000	4,500
Clams.....					306,000	2,040				
Crabs.....									86,400	2,400
Total.....	1,415,712	59,280	877,889	16,649	1,986,000	47,540	3,392,102	151,434	43,195,007	988,334

\* 125 seals.



Table showing the yield of the fisheries of Washington in 1899—Continued.

Species.	Mason.		Pacific.		Pierce.		San Juan.		Skagit.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Black-cod.....					41,000	\$980				
Cod, salted.....									380,000	\$9,500
Cultus-cod.....					50,000	750				
Flounders.....					8,000	160				
Halibut.....					2,365,000	86,725				
Herring.....					200,000	1,000				
Perch.....					18,000	270				
Rock-fish.....					57,000	1,140				
Salmon:										
Blueback, fresh.....			424,610	\$16,046	1,415,080	42,503	7,544,052	\$227,861	874,353	26,230
Blueback, salted.....					2,164	87	18,540	742		
Chinook, fresh.....			2,728,392	121,717	18,800	598	401,052	9,310	900,000	18,000
Chinook, salted.....					2,400	120	31,050	1,552		
Dog, fresh.....			723,056	3,616	674,574	14,745	226,575	4,065	249,910	4,249
Dog, salted.....							5,600	112		
Humpback, fresh.....					498,461	2,563	4,102,400	24,752	649,089	3,945
Humpback, salted.....					41,793	1,045	335,070	8,377		
Silver, fresh.....			1,843,848	45,910	1,301,590	32,418	1,087,432	18,462	1,169,828	17,647
Silver, salted.....							4,500	135		
Steelhead.....			503,469	27,512	2,668	133	21,708	1,085	28,000	1,400
Salmon trout.....					44,000	3,080				
Sea bass.....					5,000	160				
Smelt.....					100,000	2,500			240,000	3,000
Oysters.....	1,276,320	\$34,567	2,825,000	90,000						
Clams.....	103,500	660			180,000	1,500			114,625	1,145
Shrimp.....					4,000	400				
Total.....	1,379,820	35,227	9,048,375	304,800	7,029,528	192,867	13,777,979	296,453	4,605,705	85,016

Table showing, by counties, species, and apparatus, the yield of the vessel fisheries of Washington in 1899.

Apparatus and species.	Jefferson.		King.		Kitsap.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Lines:						
Black-cod.....	25,000	\$760	66,500	\$2,115	1,000	\$30
Cod, salted.....			560,000	13,750		
Halibut.....	725,000	16,875	3,346,000	81,165	75,000	1,875
Rock-fish.....			10,000	200		
Total.....	750,000	17,625	3,972,500	97,230	76,000	1,905
Dredges:						
Shrimp.....			15,600	1,560		
Grand total.....	750,000	17,625	3,988,100	98,790	76,000	1,905

Apparatus and species.	Pierce.		Skagit.		Total.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Lines:						
Black-cod.....	16,000	\$480			108,500	\$3,375
Cod, salted.....			380,000	\$9,500	930,000	23,250
Halibut.....	2,365,000	86,725			6,511,000	186,640
Rock-fish.....	7,000	140			17,000	340
Total.....	2,388,000	87,345	380,000	9,500	7,566,500	213,605
Dredges:						
Shrimp.....					15,600	1,560
Grand total.....	2,388,000	87,345	380,000	9,500	7,582,100	215,165

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Table showing, by counties, species, and apparatus, the yield of the shore fisheries of Washington in 1899.

Apparatus and species.	Chehalis.		Clallam.		Clarke.		Cowlitz.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Sekines:</b>								
Herring			4,000	\$20				
<b>Salmon:</b>								
Blueback			293,050	12,925	17,244	\$517	10,000	\$400
Chinook					42,713	1,871	46,000	2,300
Dog			97,750	935				
Humpback			376,150	1,670				
Silver			415,838	7,237	317	9	10,000	300
Steelhead					5,518	166	24,730	989
Shad							25,000	375
Smelt			2,000	40				
<b>Total</b>			1,188,788	22,827	65,792	2,563	115,730	4,364
<b>Gill nets:</b>								
<b>Salmon:</b>								
Blueback			6,680	306	12,000	360	7,000	280
Chinook	883,205	\$13,898			20,000	900	18,000	900
Dog	461,374	1,917						
Silver	1,691,797	26,154						
Steelhead	192,000	9,183			800	32	10,000	400
Shad							35,000	525
Sturgeon	24,000	900						
<b>Total</b>	3,252,376	54,052	6,680	306	32,800	1,292	70,000	2,105
<b>Pound nets:</b>								
<b>Salmon:</b>								
Blueback, fresh			60,725	2,312			12,000	480
Chinook, fresh	30,000	540	5,000	100			57,481	2,299
Dog, fresh	25,000	104	1,006	9				
Humpback, fresh			126,125	595				
Silver, fresh	175,000	2,706	36,047	596			127,005	3,805
Steelhead							28,509	1,315
<b>Total</b>	230,000	3,350	228,903	3,612			224,995	7,899
<b>Fyke nets:</b>								
Cat-fish					90,600	1,812	15,100	302
<b>Lines, trawl and hand:</b>								
Black-cod			30,000	600				
Cultus-cod			37,000	700				
Hallbut			341,640	4,340				
Rock-fish			5,000	100				
<b>Salmon:</b>								
Silver			144,108	1,801				
Steelhead	50,000	1,000						
<b>Total</b>	50,000	1,000	657,748	7,541				
<b>Wheels:</b>								
<b>Salmon:</b>								
Chinook					6,667	300		
Steelhead					5,000	150		
<b>Total</b>					11,667	450		
<b>Crab pots and dip nets:</b>								
Smelt							482,000	2,410
Crabs	5,376	224	182,920	8,495				
<b>Harpoons and spears:</b>								
Salmon, chinook			5,000	200				
Fur-seal pelts	375	1,000						
Whale oil			15,000	300				
<b>Total</b>	375	1,000	20,000	500				
<b>Dredges, tongs, rakes, etc.</b>								
Claims			484,500	2,288				
<b>Grand total</b>	3,538,127	59,626	2,669,539	45,569	200,859	6,117	907,825	17,080

Table showing, by counties, species, and apparatus, the yield of the shore fisheries of Washington in 1899—Continued.

Apparatus and species.	Island.		Jefferson.		King.		Kitsap.		Klickitat.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Seines:</b>										
Flounders					20,000	\$400				
Herring			50,000	\$500	30,000	600				
Perch					25,000	500				
<b>Salmon:</b>										
Blueback					2,669,000	107,576				
Chinook			4,000	80	22,060	467				
Dog			2,000	20	2,425,151	51,863				
Humpback			10,000	50	680,000	3,700				
Silver			6,000	90	6,305,952	95,337				
Smelt			3,000	60	70,000	1,500				
Sturgeon					13,333	500				
<b>Total</b>			<b>75,000</b>	<b>800</b>	<b>12,260,496</b>	<b>262,443</b>				
<b>Gill nets:</b>										
<b>Salmon:</b>										
Blueback					1,200,000	42,244				
Chinook					17,500	875			200	\$8
Dog					414,200	9,941				
Silver					1,314,000	20,160				
Steelhead					218,000	11,260			400	12
<b>Total</b>					<b>3,163,700</b>	<b>84,480</b>			<b>600</b>	<b>20</b>
<b>Pound nets:</b>										
<b>Salmon:</b>										
Blueback, fresh	979,730	\$29,440	211,171	6,378						
Blueback, salted	2,056	82	1,920	77						
Chinook, fresh	651,721	13,271	17,658	596						
Chinook, salted	4,920	246	3,950	198						
Dog, fresh	16,092	360	10,482	294	120,000	3,000	405,079	\$4,238		
Dog, salted	2,100	42								
Humpback, fresh	595,942	3,043	140,195	758						
Humpback, salted	37,230	931	32,940	824						
Silver, fresh	110,593	1,879	41,361	827	85,000	1,275	616,000	9,240		
Steelhead	2,412	121	2,150	107						
<b>Total</b>	<b>2,402,796</b>	<b>49,415</b>	<b>461,827</b>	<b>10,059</b>	<b>205,000</b>	<b>4,275</b>	<b>1,021,079</b>	<b>13,478</b>		
<b>Lines, trawl and hand:</b>										
Cultus-cod			4,000	80						
Halibut			8,000	240						
Sturgeon									44,078	1,905
<b>Total</b>			<b>12,000</b>	<b>320</b>					<b>44,078</b>	<b>1,905</b>
<b>Wheels:</b>										
<b>Salmon:</b>										
Blueback									10,296	309
Chinook									69,773	2,791
Silver									8,500	265
Steelhead									16,014	481
<b>Total</b>									<b>104,583</b>	<b>3,836</b>
<b>Dip nets:</b>										
Salmon, chinook									6,000	240
<b>Dredges, tongs, rakes, etc.:</b>										
Clams			18,000	75			1,924,800	15,540		
Mussels							19,200	240		
<b>Total</b>			<b>18,000</b>	<b>75</b>			<b>1,944,000</b>	<b>15,780</b>		
<b>Grand total</b>	<b>2,402,796</b>	<b>49,415</b>	<b>666,827</b>	<b>11,254</b>	<b>15,029,196</b>	<b>351,198</b>	<b>2,965,079</b>	<b>29,268</b>	<b>155,261</b>	<b>6,001</b>

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Table showing, by counties, species, and apparatus, the yield of the shore fisheries of Washington in 1899—Continued.

Apparatus and species.	Mason.		Pacific.		Pierce.		San Juan.		Skagit.	
	Lbs.	Val.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Seines:</b>										
Herring					200,000	\$1,000				
Perch					18,000	270				
<b>Salmon:</b>										
Blueback					925,000	27,750			241,035	\$7,231
Chinook			96,943	\$2,672						
Dog			5,000	25	443,862	13,316			69,280	693
Humpback					355,000	1,775			310,055	1,550
Silver			135,173	2,028	628,000	15,700			318,500	4,777
Steelhead			23,631	945						
Trout					44,000	3,080				
Smelt					100,000	2,500			240,000	3,000
<b>Total</b>			260,747	5,670	2,713,862	65,391			1,178,870	17,251
<b>Gill nets:</b>										
<b>Salmon:</b>										
Blueback					275,000	8,250			43,803	1,314
Chinook			355,739	11,253					775,000	15,500
Dog			112,600	663	218,000	1,090			177,294	3,523
Humpback									88,019	1,140
Silver			201,090	3,249	638,000	15,950			627,618	9,414
Steelhead			121,616	7,581					28,000	1,400
<b>Total</b>			790,946	22,646	1,131,000	25,290			1,739,734	32,291
<b>Pound nets:</b>										
<b>Salmon:</b>										
Blueback, fresh			424,610	16,046	215,080	6,503	7,544,052	\$227,861	589,515	17,685
Blueback, salted					2,164	87	18,540	742		
Chinook, fresh			2,275,710	107,792	18,800	598	401,052	9,310	110,000	2,200
Chinook, salted					2,400	120	31,050	1,552		
Dog, fresh			605,556	3,028	12,712	339	226,575	4,065	3,336	33
Dog, salted							5,600	112		
Humpback, fresh					143,461	788	4,102,400	24,752	261,015	1,255
Humpback, salted					41,793	1,045	335,070	8,377		
Silver, fresh			1,507,585	40,633	35,590	768	1,087,432	18,462	205,710	3,086
Silver, salted							4,500	135		
Steelhead			358,222	18,986	2,666	133	21,708	1,085		
<b>Total</b>			5,171,683	186,484	474,666	10,381	13,777,979	296,453	1,159,576	24,259
<b>Lines, trawl and hand:</b>										
Black cod					25,000	500				
Cultus-cod					50,000	750				
Flounders					8,000	160				
Rock-fish					50,000	1,000				
Salmon, silver									18,000	270
Sea bass					5,000	150				
<b>Total</b>					138,000	2,560			18,000	270
<b>Spears:</b>										
Salmon, chinook									15,000	300
<b>Dredges, tongs, rakes, etc.:</b>										
Clams	103,500	\$660			180,000	1,500			114,525	1,145
Oysters	1,276,320	34,567	2,825,000	90,000						
Shrimp					4,000	400				
<b>Total</b>	1,379,820	35,227	2,825,000	90,000	184,000	1,900			114,525	1,145
<b>Grand total</b>	1,379,820	35,227	9,048,375	304,800	4,641,528	105,522	13,777,979	296,453	1,225,705	75,616

Table showing, by counties, species, and apparatus, the yield of the shore fisheries of Washington in 1899—Continued.

	Skamania.		Snohomish.		Thurston.		Wahkiakum.		Whatcom.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Seines:</b>										
Herring									140,000	\$700
<b>Salmon:</b>										
Blueback							115,169	\$4,155	700,000	21,000
Chinook							911,567	45,677		
Dog							21,380	107	35,880	359
Silver							179,802	6,293	363,747	5,493
Steelhead							51,684	1,551		
Shad							25,000	375		
Smelt									20,000	200
Total							1,304,602	58,058	1,259,627	27,752
<b>Gill nets:</b>										
<b>Salmon:</b>										
Blueback	66,283	\$1,988							807,068	24,713
Chinook	105,888	4,741	53,009	\$1,150			1,616,258	80,813	267,808	5,569
Dog			24,930	226			30,830	154	6,360	76
Humpback			8,632	43					40,678	204
Silver			701,480	11,817			59,022	2,066	601,824	8,382
Steelhead	3,308	99	89,118	3,397			19,140	574	14,922	672
Smelt							20,000	100		
Sturgeon			720	16						
Total	175,479	6,828	877,889	16,649			1,745,250	83,707	1,638,660	39,616
<b>Pound nets:</b>										
<b>Salmon:</b>										
Blueback, fresh									23,729,366	712,397
Blueback, salt									45,320	1,813
Chinook, fresh	967	44					17,136	857	1,162,675	25,592
Chinook, salt									75,900	3,795
Dog, fresh	5,426	27					93,840	718	451,784	8,917
Dog, salted									14,602	292
Humpback, fresh									11,352,235	91,736
Humpback, salted									819,060	20,476
Silver, fresh	9,357	234					231,274	8,094	2,069,964	35,900
Silver, salted									16,500	495
Steelhead	3,513	105							53,064	2,653
Total	19,263	410					342,250	9,669	39,790,320	904,066
<b>Reef nets:</b>										
Salmon, blue-back									300,000	10,000
<b>Lines, trawl:</b>										
Sturgeon	7,554	586								
<b>Wheels:</b>										
<b>Salmon:</b>										
Blueback	466,317	17,095								
Chinook	615,759	29,516								
Steelhead	161,340	4,845								
Total	1,243,416	51,456								
<b>Crab pots:</b>										
Crabs									86,400	2,400
<b>Dredges, tongs, rakes, etc.:</b>										
Clams					305,000	\$2,040				
Oysters					1,680,000	45,500			120,000	4,500
Total					1,985,000	47,540			120,000	4,500
<b>Grand total</b>	<b>1,445,712</b>	<b>59,280</b>	<b>877,889</b>	<b>16,649</b>	<b>1,986,000</b>	<b>47,540</b>	<b>3,392,102</b>	<b>151,434</b>	<b>43,195,007</b>	<b>988,334</b>

## Summary of the yield of the shore fisheries of Washington in 1899.

Apparatus and species.	Lbs.	Value.	Apparatus and species.	Lbs.	Value.
<b>Seines:</b>			<b>Reef nets:</b>		
Flounders .....	20,000	\$400	Salmon, blueback .....	300,000	\$10,000
Herring .....	424,000	2,820	<b>Lines, trawl and hand:</b>		
Perch .....	43,000	770	Black-cod .....	55,000	1,100
<b>Salmon:</b>			Cultus-cod .....	91,000	1,530
Blueback .....	4,970,498	181,554	Flounders .....	8,000	160
Chinook .....	1,123,283	52,967	Halibut .....	349,640	4,580
Dog .....	3,100,303	67,318	Rock-fish .....	55,000	1,100
Humpback .....	1,731,205	8,745	<b>Salmon:</b>		
Silver .....	8,368,329	137,264	Silver .....	162,108	2,071
Steelhead .....	105,563	3,651	Steelhead .....	50,000	1,000
Salmon trout .....	44,000	3,080	Sea bass .....	5,000	150
Shad .....	50,000	750	Sturgeon .....	51,632	2,491
Smelt .....	435,000	7,300	<b>Total</b> .....	<b>827,380</b>	<b>14,182</b>
Sturgeon .....	13,333	500	<b>Wheels:</b>		
<b>Total</b> .....	<b>20,423,514</b>	<b>467,119</b>	Salmon:		
<b>Gill nets:</b>			Blueback .....	476,613	17,404
<b>Salmon:</b>			Chinook .....	692,199	32,607
Blueback .....	2,417,834	79,455	Silver .....	8,500	255
Chinook .....	4,112,607	137,607	Steelhead .....	182,354	5,476
Dog .....	1,445,488	17,490	<b>Total</b> .....	<b>1,359,666</b>	<b>55,742</b>
Humpback .....	137,329	1,387	<b>Crab pots and dip nets:</b>		
Silver .....	6,734,831	97,192	Salmon, chinook .....	6,000	240
Steelhead .....	697,304	34,610	Smelts .....	482,000	2,410
Shad .....	35,000	525	Crabs .....	274,696	11,119
Smelt .....	20,000	100	<b>Total</b> .....	<b>762,696</b>	<b>13,769</b>
Sturgeon .....	24,720	916	<b>Harpoons and spears:</b>		
<b>Total</b> .....	<b>14,625,113</b>	<b>369,282</b>	Salmon, chinook .....	20,000	500
<b>Pound nets:</b>			Chinook .....	375	1,000
<b>Salmon:</b>			Fur-seal pelts .....	15,000	300
Blueback, fresh .....	33,766,249	1,019,101	Whale oil .....		
Blueback, salted .....	70,000	2,801	<b>Total</b> .....	<b>35,375</b>	<b>1,800</b>
Chinook, fresh .....	4,748,100	163,199	<b>Dredges, tongs, rakes,</b>		
Chinook, salted .....	118,220	5,911	etc.:		
Dog, fresh .....	1,976,838	25,132	Clams .....	3,131,325	23,248
Dog, salted .....	22,302	446	Oysters .....	5,901,820	174,567
Humpback, fresh .....	16,711,373	122,927	Mussels .....	19,200	240
Humpback, salted .....	1,266,093	31,653	Shrimp .....	4,000	400
Silver, fresh .....	6,337,918	127,505	<b>Total</b> .....	<b>9,056,845</b>	<b>198,455</b>
Silver, salted .....	21,000	630	<b>Grand total</b> .....	<b>113,005,626</b>	<b>2,666,273</b>
Steelhead .....	472,244	24,505			
<b>Total</b> .....	<b>65,510,337</b>	<b>1,523,810</b>			
<b>Fyke nets:</b>					
Cat-fish .....	105,700	2,114			

*Whatcom County.*—In 1899 this county, the northern boundary of which borders British Columbia, contained 11 of the largest salmon canneries of the State, producing 605,406 cases of salmon against 53,118 cases put up by the only two canneries of the county in 1895. Six of the canneries were located at or near Blaine, at the international boundary line, and five at Fairhaven. The waters of this vicinity appear to be quite well supplied with numerous species of fish other than salmon, to which scarcely any attention has yet been given.

Pound nets produce the principal part of the salmon catch of Whatcom and adjoining counties, and call for particular notice. Their general construction is similar to those in common use on the Atlantic coast and in the Great Lakes, but they are of larger size. The pot of the pound is nearly 40 feet square, the leaders from 500 to the legal limit of 2,500 feet in length. Galvanized wire is much used for lead-

ers, twine being used for the pots, the latter being in water from 20 to 78 feet deep at high tide. On an average 250 piles are required for a single pound. Eighty-two pound nets were used in the waters of Whatcom County in 1899, gill nets and seines being also used to some extent. Purse seines are operated considerably in this section by fishermen from Seattle and other places.

The blueback or sockeye salmon are peculiar in being much more numerous every fourth year. During 1899 the pound nets would often be filled during a single night's run of these fish. From 5,000 to 20,000 salmon were frequently taken from a single pound at one time. The result of one day's fishing from one pound, located near Point Roberts, was 22,000 salmon, of 132,000 pounds aggregate weight and \$4,400 value.

Some of the largest firms have introduced steam pile-drivers, of a comparatively new pattern, which are built in Chicago and cost \$6,000 each. One, owned at Fairhaven, was on a scow 23 by 65 feet, being 45 inches deep; the derrick, 70 feet high; the hammer, of 7,000 pounds, is attached to a small cylinder steam engine, that has its piston directly attached to the hammer. Steam is carried to the engine by a rubber hose that follows it up and down the derrick. The hammer gives a quick short blow just the length of the piston, by which the piles are much less liable to be damaged and are quicker placed than by the old-time drop hammer. Nine men comprise the working crew.

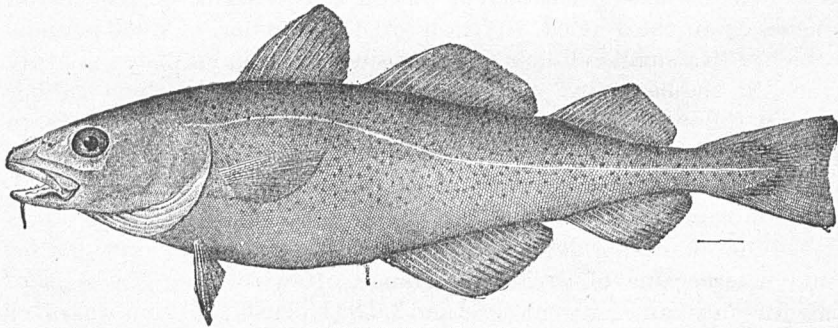
With the increasing demand for salmon the desirable locations for pound nets became of great importance, often forming the basis of small fortunes, and between 1889 and 1899 the rush for them was often exciting. Locations not already taken could be secured from the State by its citizens only, they paying \$25 for an annual license, after which a numbered license was given that permitted the putting down of a pound net in any of the waters of the State not already occupied. The requisites to secure the location were the driving of a few piles on the spot selected and attaching on the same a conspicuously painted number of the license. In numerous cases license fees have been paid, a few piles have been placed and numbered, but the pound nets have not been put down. The State report of pounds licensed therefore often varies considerably from the number in actual use.

During 1898 and 1899 pound nets in the most desirable locations have changed hands at prices ranging as high as from \$20,000 to \$90,000 for single pounds, the original expense of which did not exceed \$5,000. Five pounds, with fixtures and location, were reported as having been sold during 1899 at prices ranging from \$35,000 to \$90,000, the aggregate being \$300,000. It is not probable that such high values will ever be realized again.

Fairhaven being near the valuable fishing waters of Whatcom County, and also having desirable rail and water shipping facilities, has of late come into fishery prominence. Previous to 1895 only a

limited amount of fresh fish was shipped from there, but since that date five salmon canneries have been built, their aggregate pack in 1899 being 329,428 cases. Some of these canneries are the largest on the coast, all having the latest improved appliances for the canning of fish and giving employment to 1,280 persons.

The plant of the Pacific American Fishery Company is of special note. It embraces 18 acres, of which 10 acres are occupied by two canneries, warehouses, offices, and other buildings. This double cannery has a ground floor area of 6 acres, the second story 2 acres. The buildings are lighted from their own electric plant and have all the latest labor-saving machines. The daily capacity is 7,500 cases of 48-pound cans of salmon. The largest amount packed in any one day during 1899 was 5,000 cases. The pack during the season amounted to 139,790 cases (representing over 9,000,000 pounds of fresh salmon), the largest amount on record from any of the canneries of the State.



COD (*Gadus callarias*).

Some small beds of native oysters in Samish Bay, long known, but neglected, are now being improved and give favorable promise for the future. During 1899 2,000 bushels of oysters, worth \$4,500, were disposed of locally by a few white men and Indians who gathered them by hand at low tide.

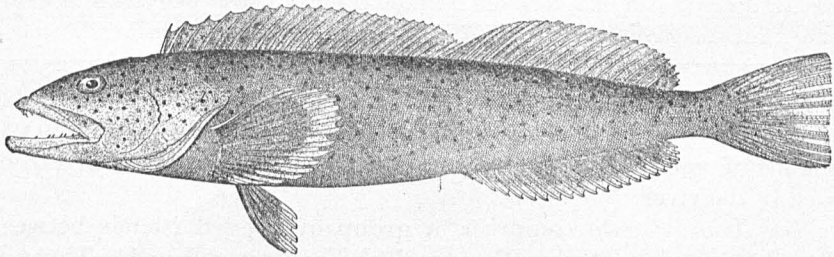
*Skagit County.*—The fisheries continue to increase in importance. The three large salmon canneries at Anacortes packed 172,232 cases during 1899. The fish for the same amounted to 12,053,823 pounds of salmon, gross weight. The waste from these canneries produced 350 tons of fertilizer and 22,000 gallons of salmon oil. Clams are more or less plentiful around the islands of Skagit and San Juan counties. From October to April is the clam season, during which time a few Indians work the beds and dispose of the clams at a small cannery at Anacortes. The pack of clams of 1899, all of which were the hard-shell species, amounted to 2,140 cases. The shells are shipped to Seattle, where they are sold for use in poultry yards.

The cod fishery is here represented by one vessel of 143 tons that landed 380,000 pounds of cod taken in Bering Sea. The cod are dried and prepared for market as boneless fish.

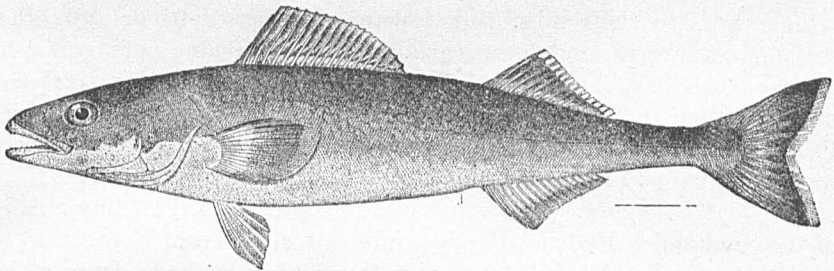


Skagit River furnishes one of the most important fisheries in the State, and except the Columbia River is practically the southern limit of migration of the valuable sockeye salmon. These fish in quite large numbers ascend the river to the distant cold waters of Baker Lake for spawning. They furnish a large amount of the catch and income of many fishermen residing near the river's outlet.

The fisheries of Skagit River and the immediate vicinity show some decrease both in products and fishermen since 1895. The pound nets outside the mouth of the river are reported as having an increased catch at the expense of the usual supply of the river. The catch of 1899 found a ready market at largely increased prices over those of a



CULTUS-COD (*Ophiodon elongatus*).



BLACK COD OR BESHOWE (*Anoplopoma fimbria*).

few years since, the fishermen having larger returns than formerly, when the catch was much larger and prices very low. Only gill nets are used in the river fisheries. Drift gill nets used in the river are 55 fathoms long and set gill nets 10 fathoms long. A few near the mouth of the river are each 125 fathoms in length, 20 meshes deep, of 9 and 10 inch mesh. A few Indians on the near-by reservation fish for the market, and many of them for their personal use, their catch being by the primitive yet effective spear.

The various runs of salmon in the Skagit River are as follows: Chinook, from the last of May up to the last of August; silver salmon, from the last of August to November; a few humpbacks are taken in August; dog salmon run from September to November 15; blueback, from the last of May to July 15, with their greatest abundance in June. But few bluebacks are taken, as their capture requires a smaller-meshed net than those generally used for larger species of salmon.

Steelheads are much scarcer than formerly. They are found as early as the middle of November, but not many before December, there being a scattering light run all winter.

La Connor, at the mouth of the river, continues to be the headquarters for the river fishermen. Here supplies are purchased and the fish are sold to agents of fresh-fish firms and canneries.

The prices and average weights of fish in 1899 were as follows:

Salmon.	Price.	Pounds.
Steelhead .....	5 cents per pound .....	11
Chinook .....	2 cents per pound .....	20
Humpback .....	3 cents each .....	4
Dog .....	6 cents each .....	15
Blueback .....	20 cents each .....	6½
Silver .....	13 cents each .....	8

The catch from the Skagit River during 1899 amounted to 1,652,320 pounds of salmon, that brought the fishermen \$30,997, and 240,000 pounds of smelt, of \$3,000 value. No pound nets are permitted to be used in the river.

*San Juan County* comprises a group of rugged islands between Skagit County and the southern end of Vancouver Island. Through the numerous waterways of these islands the immense numbers of salmon pass in their migration toward the Fraser River and other streams northward, and here are located many pound nets owned by the canneries of Whatcom County. One cannery at Friday Harbor, a branch of one at Fairhaven, packed 20,549 cases of salmon, of which 14,908 were blueback. The total amount of salmon used at the cannery was 1,359,620 pounds gross weight, all caught by pound nets.

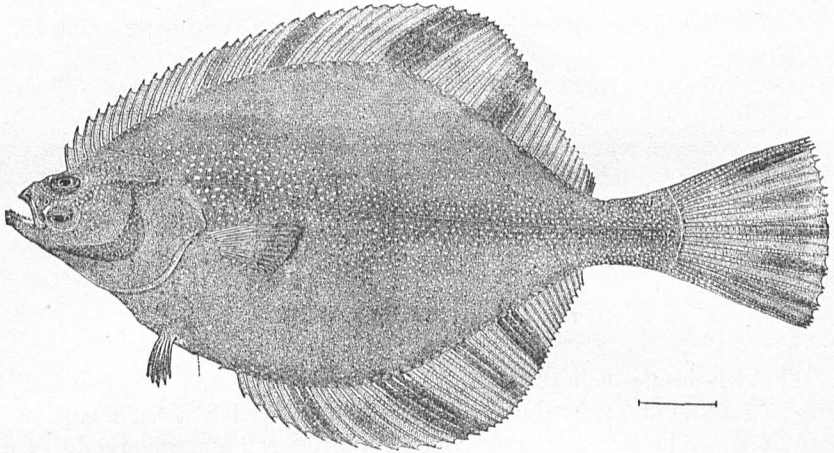
*Snohomish County.*—The fisheries are confined to the salmon catch of the Snohomish River. The few miles of river from Everett, at its mouth, to Snohomish City comprise the fishing-grounds, from which 607,169 pounds of salmon were taken in 1899. Five-sixths of this amount was silver salmon, the remainder comprising, with the exception of the blueback, all the other species of salmon. Sturgeon are occasionally taken in the salmon nets, but here as elsewhere in the numerous rivers of the coast these valuable fish have been nearly exterminated. The catch of this stream is bought by agents of Seattle cannery and fresh-fish firms.

*King County.*—The fisheries of this county are practically the fisheries of Seattle. The continued large increase in the fish business of that city is shown by the following receipts from the home fishermen:

Year.	Pounds.	Value.
1892 .....	2,385,352	\$72,300
1895 .....	11,469,118	123,682
1899 .....	19,601,545	448,428

The products comprised 15,470,712 pounds of salmon, 3,346,000 pounds of halibut, 234,833 pounds of other species of fresh fish, and 550,000 pounds of salted cod. This catch, with the exception of cod and part of the halibut, was made in the waters of the State by 893 fishermen of King County, fishing through the waters of Puget Sound.

The investment in vessels, boats, fishing apparatus and shore property in the county amounted to \$204,002, which amount, with a cash capital of \$549,000, makes a total of \$753,002 invested in the fisheries of King County. The two canneries at Seattle put up 91,500 cases of salmon, valued at \$344,225, using 6,105,938 pounds of fish, gross weight. Seattle is also a market for fishery products from other sections of the State. The wholesale dealers handle most of the fish fresh. In 1899 they shipped 10,418,908 pounds, to which may be added 752,852 pounds of salted fish. The oysters, crabs, clams, shrimp, and mussels handled represented \$85,265 in value.



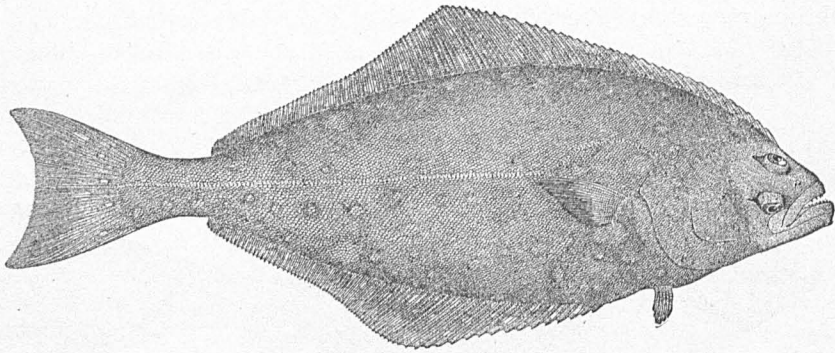
STARRY OR CALIFORNIA FLOUNDER (*Paralichthys stellatus*).

The increase in salmon and halibut taken by the home fisheries since 1895 was as follows:

Species.	1895.	1899.
Salmon .....	<i>Pounds.</i> 3,994,650	<i>Pounds.</i> 15,470,712
Halibut .....	790,000	3,346,000

Considerable quantities of salmon, halibut, and herring were smoked, and this business slowly increases. The products show a great improvement in quality, and will compare favorably with those of any section of the country. Some Seattle firms have establishments in Alaska where the salting of salmon is largely carried on, the salted fish finding a growing market in the Eastern States and in Japan.

The halibut fishery by fishermen of Kings County has grown to considerable importance by an increased number of small-sized vessels of only a few tons burden, with from two to five men each, a few having larger crews. These little craft follow the business all through the year. From April to October the catch is largely from grounds inside and outside of the Straits of Juan de Fuca in the vicinity of Cape Flattery, with less amounts from the waters of Puget Sound. After October the larger vessels leave for Alaska, fishing through the winter near Wrangell Narrows, shipping their catch to Seattle, up to April, by local steamers. The halibut fishermen seldom save any other fishes, although several species of good food-fish are plentiful all through these waters. Even halibut prices of 2 to 3 cents a pound are very low when compared with those paid to fishermen of the Atlantic coast.



THE HALIBUT (*Hippoglossus hippoglossus*).

The wholesale fish trade of Seattle in 1899 was represented by nine establishments, valued at \$148,000, and with a cash capital of \$152,000. The persons employed numbered 159 and received \$74,622 in wages. The following table gives the details of this trade:

	Lbs.	Value.		Lbs.	Value.
<b>Fresh fish sold:</b>			<b>Pickled and smoked fish:</b>		
Black cod .....	96,100	\$4,808	Cod, salted .....	422,500	\$18,100
Cultus cod .....	70,000	2,630	Halibut, salted .....	1,800	72
Halibut .....	4,081,267	129,231	Herring, pickled .....	205,000	4,200
Herring .....	116,140	2,527	Salmon, pickled .....	1,123,400	33,082
Flounders .....	24,200	956	Halibut, smoked .....	111,845	7,895
Perch .....	46,030	1,842	Herring, smoked .....	33,534	1,005
Rock-fish .....	17,000	850	Salmon, smoked .....	208,680	10,450
<b>Salmon:</b>			<b>Total .....</b>	<b>2,106,762</b>	<b>74,804</b>
Chinook .....	877,400	44,022	<b>Miscellaneous:</b>		
Silver .....	1,982,000	85,460	Crabs .....	208,752	12,712
Dog .....	1,485,700	50,971	Clams .....	533,400	6,750
Humpback .....	471,500	12,322	Oysters .....	1,338,970	50,120
Steelhead .....	472,800	37,824	Oysters .....	105,300	22,230
Smelt .....	270,400	9,130	Shrimp .....	15,600	2,340
Sturgeon .....	16,890	551	<b>Total .....</b>	<b>2,202,022</b>	<b>94,152</b>
Trout, salmon .....	10,500	1,312	<b>Grand total .....</b>	<b>14,346,871</b>	<b>558,419</b>
Trout, brook .....	110	27			
<b>Total .....</b>	<b>10,038,087</b>	<b>384,463</b>			

*Kitsap County.*—The fisheries are prosecuted by about 40 Indians, who furnish the Seattle market with clams and mussels, taken almost within sight of the city. They receive \$1 per sack of 125 pounds, or about 50 cents per bushel. Only hard-shell clams are found.

*Pierce County.*—The fisheries of this county are of some importance, being represented by three small vessels, one steamer of 78 tons, and 96 small boats, 321 fishermen, and 41 shore employees, the capital invested amounting to \$130,729. The products included 6,845,528 pounds of fish of \$190,967 value to the fisherman, and \$1,900 worth of clams and shrimp.

Of the fish receipts 2,365,000 pounds were halibut and 3,957,528 pounds salmon. The remainder consisted of smelt, herring, rock, cultus-cod, flounders, and a few other species. Shipments of fresh halibut to the east of the Rocky Mountains amounted to 1,811,000 pounds. The remainder, after supplying the home demand at Tacoma, was distributed to numerous points throughout the interior.

The steamer mentioned is engaged exclusively in the halibut fishery in Alaskan waters, making headquarters and shipping to eastern points from Tacoma.

Shrimp are taken near Anderson Island at the southern end of Puget Sound, by the use of drag nets.

The fisheries of the county center at Tacoma, which has also one fish cannery that put up a general assortment of prepared fish, including salmon, canned and in oil, clams and clam chowder, smoked salmon, herring, and halibut; also smoked herring in olive oil in 1-pound tins, marinated and deviled herring in glass packages, Russian sardines in 15-pound pails, and salt herring in barrels.

There were two wholesale fish establishments at Tacoma in 1899, valued at \$17,000, and with a capital of \$38,000. They employed 27 persons, who received \$10,000 in wages. The quantities and value of the products handled in that year by these establishments are shown by the following table:

Products.	Lbs.	Value.	Products.	Lbs.	Value.
Black cod, fresh .....	12,000	\$610	Salmon:		
Black cod, salted .....	4,000	280	Chinook, fresh .....	70,000	\$4,700
Bass, fresh .....	5,000	450	Silver, fresh .....	300,000	14,000
Cat-fish, fresh .....	2,000	120	Dog, fresh .....	300,000	14,750
Cultus-cod, fresh .....	9,000	340	Dog, smoked .....	100,000	3,500
Flounders, fresh .....	6,000	120	Humpback, fresh .....	325,000	5,500
Herring, fresh .....	125,000	2,375	Steelhead, fresh .....	27,000	2,390
Herring, salted .....	10,000	250	Trout, brook, fresh .....	1,000	120
Halibut, fresh .....	2,410,000	84,350	Trout, salmon, fresh .....	44,000	4,320
Halibut, salted .....	204,000	8,200	Clams .....	169,000	1,830
Perch, fresh .....	13,000	400	Crabs .....	12,000	750
Rock-fish, fresh .....	30,000	1,350	Shrimp .....	4,000	500
Smelt, fresh .....	70,000	2,900			
Surgeon, fresh .....	4,000	400			
Salmon, salt .....	42,000	1,200	Total .....	4,298,000	155,705

*Mason and Thurston counties.*—These two counties are at the extreme southern end of Puget Sound. Their fisheries yield among other things the small Puget Sound oysters, and Hoods Canal, in Mason County, at times furnishes salmon in considerable quantities. The oyster business of this section, formerly of considerable importance, has been reduced from overfishing, with little or no care of the beds, so that the products of the two counties in 1895 amounted to only \$17,132 in value. During that year legislative action, disposing of lands suitable for oyster culture and protecting the same, led to an increase of size and improvement in quality of the oysters with a large increase in the yield, which in 1899 amounted to 29,636 sacks, or 49,272 bushels, of \$80,067 value.

The oyster-grounds are located in Oyster Bay, which produces the largest amount, and Mud Bay, Oakland, or Shelton Bay, Swindels Cove, North and South bays, all being in Mason and Thurston counties. The products are marketed chiefly at Olympia. The oyster and clam business gave employment to 128 men, and yielded 6,825 bushels of clams of \$2,700 value. A small cannery at Olympia made a limited pack of clams and fish.

In 1899 there were five establishments at Olympia handling oysters and clams. Their fixtures, machinery, etc., were valued at \$11,575, and their cash capital was \$11,300. They employed 39 people, who received \$8,600 in wages.

The following table shows the products handled and their value:

Products.	Lbs.	Value.
Oysters, bushels, 9,000 .....	540,000	\$16,444
Oysters, gallons, 15,400 .....	107,800	29,260
Clams, bushels, 4,415 .....	286,975	3,800
Clams, canned, dozens, 1,220 .....	25,296	14,640
Clam nectar, dozens, 400 .....	9,600	500
Total .....	969,671	61,644

*Clallam County.*—This county, at the entrance to the Strait of Juan de Fuca, and the northwestern extremity of the State, has important halibut and salmon fisheries, together with fisheries by Indians at Neah Bay, a salmon cannery at Port Angeles, and the crab fisheries of Dun- geness. The Indians, in 1899, caught, by trolling with spoon hook, 15,926 silver salmon, which they disposed of to canneries at 10 cents each. They continue to use canoes and paddles in all their fisheries, and also in pursuing whales, 12 of the latter being taken during 1899. The largest part of the whale is cut up into strips for drying, and, with smoked halibut and salmon, forms a large portion of their winter's food supply. These Indians were formerly quite largely interested in the fur-seal fisheries, and had a number of sealing vessels, in which they followed the seals northward to Bering Sea. As this is now prohibited, they have disposed of their vessels.

The harbor of Port Angeles is one of the best on the Pacific coast. Fish are plentiful in the vicinity, and the place will no doubt have more important fisheries in the future. The cannery here, in 1899, packed 29,124 cases of salmon and 2,000 cases of clams and clam nectar of \$116,428 value; 2,038,680 pounds of salmon, gross weight, and 4,370 bushels of clams were used at the cannery. The clams were bought at 30 cents a bushel from the Indians of Port Williams.

New Dungeness and the adjoining Port Williams have important crab fisheries, the catch being made in the harbors of these two places with pots similar to those used in New England for lobsters. The pots are baited with clams and refuse fish and anchored in about 3 fathoms of water. This fishery is followed more or less all through the year, the catch being made chiefly during the winter and spring, the summer demand being light. The catch by fishermen of New Dungeness amounted to 135,480 pounds of \$6,435 value, and from Port William 37,440 pounds of \$1,794 value.

Crabs are reported to be of average abundance from year to year, notwithstanding the large amount taken from a small area of fishing-grounds. The catch as soon as landed is packed alive in large boxes holding 10 dozen each. The average weight of the crabs was 2 pounds each; the average price received by the fishermen, \$1.15 per dozen. The crabs are shipped by steamer to Seattle and are distributed all through the Northwest and as far south as San Francisco.

The quantity of fish taken in Clallam County since 1895 does not vary so much in amount as in value, showing that the fishermen have received a decided gain during a more prosperous condition of the country, the comparison being as follows:

Items.	1895.		1899.	
	Lbs.	Value.	Lbs.	Value.
Fish.....	2,065,025	\$17,879	1,987,119	\$34,486
Crabs.....	121,620	3,256	182,920	8,495

*Jefferson County.*—The fisheries center at Port Townsend, supplying that city, the surplus finding a market at Seattle. Fish of numerous varieties are reported plentiful in this vicinity and the fisheries are quite likely to show an increase in the future. In 1899 the few fishermen of the county marketed 1,316,827 pounds of fish of \$28,879 value, as against 912,435 pounds of \$16,724 value in 1895.

*Chehalis County.*—The fisheries of this county are limited to the salmon catch from the Chehalis River and near its outlet. Just outside the river's mouth many species, including smelt, herring, flounders, rock-fish, perch, and bastard halibut are plentiful. As they are within quick reach of the large fresh-fish markets of Seattle and Portland, these grounds will probably at an early day contribute materially to the income of the fishermen.

The salmon catch of 1899 was mostly taken by gill nets used in the river near its outlet. As compared with 1895, it shows quite an increase, the gross weight and value to the fishermen being as follows:

Year.	Lbs.	Value.
1895 .....	1,971,357	\$35,135
1899 .....	3,508,376	57,502

One salmon cannery packed 24,240 cases, of which 15,740 were silver salmon, 5,000 chinook, and 3,500 chum or dog salmon. Shipments fresh amounted to 1,811,576 pounds as against 1,115,390 pounds in 1895. The persons employed were 260 fishermen and 50 shore employees, and the capital amounted to \$64,889. Aberdeen, at the head of Grays Harbor, is the chief shipping-point, less fishery business being done at Cosmopolis and Hoquiam.

The Indians of the Quinaiult Reservation take salmon from the river, most of the catch being used on the reservation. 56,257 pounds, of \$1,297 value, were sold to the fish agents at Aberdeen in 1899. The Indians also captured the only fur seals taken on the coast, spearing from their canoes 125 seals, for which they received \$1,000.

*Pacific County.*—Salmon and oysters are the only species of importance in this county at present. The capital, employees, and products of the fisheries in 1895, as compared with those of 1899, were as follows:

Items.	1895.	1899.
Capital invested .....	\$448,020	\$484,765
First value of fish .....	186,031	214,800
First value of oysters .....	92,100	90,000
Fishermen .....	583	891
Shore employees .....	246	162

The salmon product of 1899 from the Columbia River and Willapa Bay and its tributaries was as follows:

Species.	Lbs.	Value.
Chinook .....	2,728,392	\$121,717
Silver .....	1,813,848	45,910
Dog .....	723,056	3,616
Blueback .....	424,610	16,045
Steelhead .....	503,469	27,512
Total .....	6,223,375	214,800

This large amount of salmon was sold at higher prices than ever before received. The fishermen reaped the benefit of the competition between the canners and cold-storage fresh-fish firms. Three canneries were operated on Willapa Bay and its tributaries, and one on the Columbia River. The single cannery on the Columbia River packed 15,000 cases, of \$83,425 value, and the three canneries on Willapa Bay,



21,314 cases, of \$79,176 value. A large portion of the catch went to the fresh-fish firms.

The oyster business, from lack of proper care of the beds, shows a steady decrease, only 45,000 sacks having been shipped in 1899, as against 78,825 sacks in 1892 and 61,400 sacks in 1895. The sacks contain about 1½ bushels each and weigh about 85 pounds. With a growing scarcity of oysters, sacks are somewhat smaller and prices have advanced from \$1.50 a sack in 1895 to \$2 a sack in 1899. The business in native oysters is confined to Willapa Bay. Eastern oysters of full size, planted here experimentally by the U. S. Fish Commission, have been found to grow well, but there are as yet no evidences as to their propagation in these waters. It is understood that oysters from Eastern seed are now being grown in Willapa Bay, after the manner practiced in California, where seed oysters are brought annually from the Atlantic coast and laid in favorable localities in San Francisco Bay for further growth.

*Wahkiakum County.*—The fisheries of this county are practically limited to its salmon catch from the Columbia River, which forms its boundary on the south. During 1899 four canneries were operated, packing 60,868 cases of salmon, of \$313,345 value. The capital invested in the fisheries of the county amounted to \$353,520, the fishermen numbered 596, and the shore employees 205. The gross weights of fish caught and values to the fishermen were as follows: Salmon, 3,347,102 pounds, \$150,959; shad, 25,000 pounds, \$375; smelts, 20,000 pounds, \$100. The shad and smelt were taken from seines used in the salmon fishery, which often contain more shad than salmon.

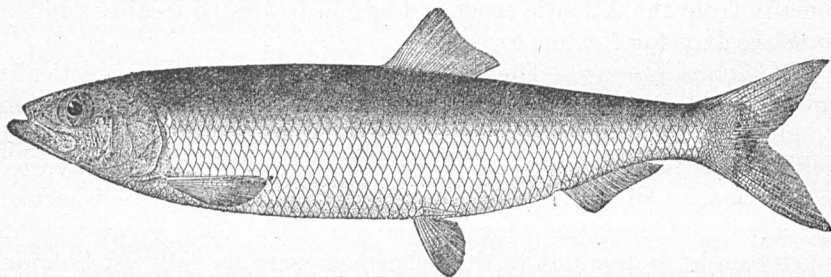
Shad are not fished for specially and bring so low a price that they are sometimes used as fertilizer, but oftener thrown back into the river. They are usually first taken about the middle of April, being most abundant up to the middle of June. The first sent to the Portland market in 1899 brought 8 cents each, at which price they were saved. As their number increased prices dropped to 2 or 3 cents, or about one-half cent a pound, and as that barely covered the freight and expenses, leaving nothing to the fishermen, the shipments stopped. Shad are of large size and fine quality. A few which were canned as an experiment retained their fine flavor, and were much improved by the entire disappearance of bones from the action of the excessive heat in cooking. The canning of shad may yet form an important factor in the fisheries of the Columbia River.

Of the salmon pack of 1,200 cases, 84,000 pounds of silver and dog salmon were from Grays Harbor, the remainder of the pack being Columbia River fish.

*Cowlitz County.*—Of late years the fisheries of this county have decreased in importance. The catch is from the Columbia and Cowlitz rivers. The aggregate amount in 1899 was 907,825 pounds, of \$17,080 value, composed of 350,725 pounds of salmon, 482,000 pounds

of smelt, 60,000 pounds of shad, and 15,100 pounds of cat-fish. Of this amount 300,000 pounds went to the canneries of the river, the remainder to cold-storage and fresh-fish firms. The smelt catch is made with dip nets in the Cowlitz River, the fishermen receiving prices that average only one-half cent a pound.

*Skamania County.*—Twenty salmon fish-wheels in this county in 1899 caught 1,243,416 pounds of salmon, valued at \$51,456. Twenty-one gill nets caught 175,479 pounds of salmon, and two small pound nets took 19,263 pounds of salmon, the aggregate being 1,438,158 pounds of salmon, of \$58,694 value. The catch of 1895 amounted to 1,484,723 pounds of salmon. During 1895 the sturgeon catch was considerable, being 1,177,106 pounds, against 7,554 pounds in 1899. The capital invested during 1899 amounted to \$58,460; the fishermen numbered 71.



PACIFIC HERRING (*Clupea pallasii*).

*Clarke County.*—The fisheries here are maintained by a few fishermen of Vancouver, who fish in the Columbia River, the catch of salmon and cat-fish being marketed at Portland.

*Klickitat County.*—This county is bordered on the south for nearly 150 miles by the Columbia River. The fisheries receive but little attention. Near the western end of the county eight fish-wheels were operated with indifferent results. A few Indians used dip nets and a few hooks were employed for sturgeon. The total catch amounted to only 111,183 pounds of salmon and 44,078 pounds of sturgeon.

The fishing beyond this section, higher up on the Columbia, is by the ranchers or Indians living near the stream, their small catch being for their own use.

FISHERIES OF OREGON.

The seven counties forming the western boundary of Oregon border on the Pacific for some 300 miles. Along this long stretch of ocean front are many fine fishing-grounds that are yet to be utilized; some are near shipping-points and none are far removed from good markets.

Up to the present time the fisheries of the State have been limited almost exclusively to salmon taken from near the outlets of the numerous rivers which flow into the Pacific. These streams drain many lakes of the interior, more or less supplied with trout and other fish. Some of the more accessible lakes are resorts for sportsmen. In most of the rivers the salmon catch shows a decrease when compared with previous investigations, the decrease in many cases being due to excessive fishing.

The capital invested, persons employed, and value of products in 1895 and 1899 are here shown:

Items.	1895.	1899.	Salmon canned.	1895.	1899.
Capital invested.....	\$2,637,412	\$3,497,643	Cases.....	525,839	341,297
First value of products..	1,282,036	855,750	Value.....	\$2,456,698	\$1,704,235
Employees.....	6,323	5,643			

The decrease in the amount of salmon canned is accounted for, in part, by the large quantities used fresh or pickled. Nearly all of the coast rivers show a decrease in the amount of salmon canned, the largest decrease being in that of the Columbia River.

The following tables give the statistics of the fisheries in 1899:

Table of persons employed.

How engaged.	No.
On vessels fishing.....	10
On vessels transporting.....	65
In shore fisheries.....	3,731
On shore, in canneries, etc.....	1,837
Total.....	5,643

Table of apparatus and capital.

Items.	No.	Value.	Items.	No.	Value.
Vessels fishing.....	1	\$0,000	Apparatus—shore fisheries:		
Tonnage.....	59		Wheels.....	47	\$121,300
Outfit.....	30	335	Fyke nets.....	36	360
Vessels transporting.....	30	66,300	Hoop nets.....	2,325	1,829
Tonnage.....	330		Crab pots.....	80	80
Outfit.....		4,490	Dip nets.....	12	60
Boats.....	1,830	198,240	Guns.....	4	100
Apparatus—vessel fisheries:			Tongs, rakes, hoes, etc.....		191
Lines, trawl.....		400	Shore and accessory property.....		1,174,148
Apparatus—shore fisheries:			Cash capital.....		1,561,000
Gill nets.....	2,067	297,700	Total.....		3,497,643
Seines.....	46	19,910			
Pound nets.....	65	45,200			

Table of products.

Species.	Lbs.	Value.	Species.	Lbs.	Value.
Cat-fish .....	54,360	\$1,087	Perch .....	6,360	\$95
Flounders .....	3,522	53	Shad .....	32,000	320
Halibut .....	17,000	1,360	Smelt .....	28,000	340
Herring .....	19,120	347	Oysters (985 bushels) .....	59,100	1,625
Salmon:			Clams (15,006 bushels) .....	979,290	9,434
Blueback .....	579,183	21,293	Crabs .....	116,400	2,615
Chinook, fresh .....	13,744,810	659,213	Crawfish .....	116,400	7,760
Chinook, salted .....	2,400	75	Sea-lion pelts .....	18,000	720
Dog .....	789,615	3,948	Sea-lion oil .....	750	35
Silver .....	5,154,375	97,281	Sea-lion trimmings .....		135
Steelhead .....	1,103,522	48,014	Total .....	22,818,411	855,750

COLUMBIA RIVER FISHERIES.

The fisheries of the Columbia River are here exhibited in tables which show the total number of cases of salmon canned from 1866 to 1899 and the quantity of salmon frozen at the cold-storage plants during 1899. The Columbia being bordered by Washington and Oregon, the fishery tables are here given for the river, the amount credited to each State being included in the tables showing the products by counties and States.

The commercial fisheries of the Columbia may be dated from 1866, in which year the first salmon cannery on the river opened the business with a pack of 4,000 cases. In the thirty-four years since that date, or from 1866 to and including 1899, the total amount of salmon canned on this stream amounted to 13,111,110 cases of 48 pounds each, or 629,333,280 pounds of canned salmon, of \$73,346,465 value. The table showing the pack of each year is interesting for reference. The small amount packed the first two years sold at an average of \$16 a case, the highest prices ever received. During the next three years the price fell to \$12 per case, and between 1871 and 1875 a constantly increased catch ranged from \$10.50 down to \$6. The next five years prices ranged from \$5.50 to \$5. The lowest prices ever known were \$4.50 in 1881, the prices remaining between \$4.50 and \$5 from 1881 to 1886. During the past thirteen years prices have ranged between \$5, the lowest, and \$6.25 in 1888, the highest. The values given are for the chinook salmon, which is of world-wide reputation and was for many years the only species packed. Of late years the fall run of silver salmon has received more attention.

The largest pack in any year was in 1895, when 634,696 cases were packed; the smallest since 1889 was that of 328,174 cases in 1899, a decrease of nearly 50 per cent from the extra large pack of 1895. A comparison between these two years is as follows:

Items.	1895.	1899.
	<i>Lbs.</i>	<i>Lbs.</i>
Salmon used at canneries .....	41,706,001	21,503,326
Salmon sold fresh and frozen .....	4,699,657	2,448,508
Salmon pickled .....		1,546,756
Total .....	46,405,658	25,498,690

The salmon catch of the Columbia River has been decreasing during the past few years. For many years the river has been overfished, and the quantity of fishing apparatus has been constantly increasing. During 1899 3,944 fishermen and 1,447 shoresmen were employed. The fishing apparatus consisted of 444 pound nets, 1,356 gill nets, 32 haul seines, and 76 fish-wheels.

Aside from salmon, the fisheries of the Columbia are at present of small value and receive but little attention.

*Summary of the salmon-canning industry of the Columbia River, in Oregon and Washington, between 1866 and 1899.*

Year.	Cases.	Value.	Year.	Cases.	Value.	Year.	Cases.	Value.
1866....	4,000	\$64,000	1878....	460,000	\$2,300,000	1890.....	435,774	\$2,407,456
1867....	18,000	283,000	1879....	480,000	2,640,000	1891.....	398,953	2,240,964
1868....	28,000	392,000	1880....	530,000	2,650,000	1892.....	487,328	2,679,036
1869....	100,000	1,350,000	1881....	550,000	2,475,000	1893.....	415,877	2,107,500
1870....	150,000	1,800,000	1882....	541,300	2,600,000	1894.....	506,987	2,651,940
1871....	200,000	2,100,000	1883....	628,400	3,147,000	1895.....	634,036	3,342,238
1872....	250,000	2,325,000	1884....	620,000	2,915,000	1896.....	463,777	2,261,826
1873....	250,000	2,250,000	1885....	553,800	2,500,000	1897.....	532,721	2,219,311
1874....	350,000	2,625,000	1886....	448,500	2,135,000	1898.....	481,461	2,087,748
1875....	375,000	2,250,000	1887....	356,000	2,124,000	1899.....	328,174	1,763,625
1876....	450,000	2,475,000	1888....	372,477	2,327,981			
1877....	380,000	2,052,000	1889....	309,885	1,809,820	Total ..	13,111,110	73,946,466

Shad appear to be constantly increasing, many tons being taken in the haul seines used in the salmon fishery, but only a few are saved, the demand being very light and prices so low that fishermen prefer to throw them back into the river or use them for fertilizer. The shad will probably become a valuable addition to the products of the river, as the demand from fresh-fish dealers continually increases.

The cold-storage fish business is represented by four firms, located at Portland, Goble, and Astoria, representing \$265,000 capital, with 81 employees. Two of the cold-storage plants, used exclusively for fish, have the latest improved machinery and are large and noticeable for their cleanness and attractive appearance.

The shipments of fresh salmon to points east of the Rocky Mountains began in a small way during 1890 and the business soon became important. It finally extended to Europe, large quantities of fresh frozen salmon being sent to Hamburg and from there distributed over the Continent. This has been followed by a growing business in pickled slack-salted salmon for smoking, of which 1,308,494 pounds net weight were shipped to Europe from the cold-storage establishments of the Columbia River during 1899. The chinook salmon only were used in supplying the foreign demand for pickled salmon, a large-size fat fish being desired for smoking.

In the preparation of the fish, they are split on the under side and eviscerated, and the head, fins, tail, and backbone are removed. The dressed fish, after a thorough washing, are well salted and packed in tierces, the first few being placed back down, others back up, with layers of salt between. After the casks are filled pickle is added. The

packed casks average 800 pounds of salmon. The fish, being only slack-salted, are at once placed in cold storage until wanted for shipment, and are then sent in refrigerator cars to New York and in the cold-storage rooms of steamers to Europe. The demand for large-size pickled salmon for Europe began about 1896, since which time it has yearly increased. The constantly increasing demand for fresh frozen and pickled salmon from the Columbia River has to some extent reduced the output of canned salmon and led to sharp competition between the canners and cold-storage firms, resulting in the fishermen receiving much higher prices than ever before.

In 1899 four establishments, valued at \$120,000, and with a cash capital of \$145,000, were engaged in cold-storage fish business on the Columbia River in Oregon. Their employees numbered 77. The products and their value are shown by the following table:

Items.	Lbs.	Value.
Salmon:		
Silver, frozen .....	866,905	\$44,584
Chinook, frozen.....	39,966	1,998
Dog, frozen .....	117,739	4,710
Steelhead, frozen .....	897,534	78,694
Chinook, pickled .....	1,308,494	145,852
otal salmon.....	3,230,638	275,784
Sturgeon, frozen .....	38,725	3,873
Caviar .....	1,587	1,191
Grand total .....	3,270,950	280,802

## STATISTICS OF OREGON BY COUNTIES.

The following tables show the fisheries of Oregon for 1899 by counties, and give in detail the persons employed, capital invested, products by species, and first value of same, and the catch by each form of apparatus. The general decrease in the fisheries of late years is due chiefly to a lighter catch of salmon as compared with former years.

Table showing, by counties, the number of persons employed in the fisheries of Oregon in 1899.

Counties.	On vessels fishing.	On vessels transporting.	In shore fisheries.	On shore, in canneries, fish-houses, etc.	Total.
Clackamas .....			106		106
Clatsop .....	10	39	2,224	1,197	3,470
Columbia .....			162	12	174
Coos .....			318	105	427
Curry .....			3	59	115
Douglas .....			3	50	257
Lane .....			8	87	141
Lincoln .....				234	335
Multnomah .....			8	170	355
Tillamook .....				106	164
Wasco .....				36	86
Washington .....				14	14
Yamhill .....				10	10
Total .....	10	65	3,731	1,837	5,643

Table showing, by counties, the vessels, boats, apparatus, and other property employed in the fisheries of Oregon in 1899.

Counties.	Vessels fishing.				Vessels transporting.				Boats.	
	No.	Ton-nage.	Value.	Value of outfit.	No.	Ton-nage.	Value.	Value of outfit.	No.	Value.
Clackamas									51	\$1,005
Clatsop	1	59	\$6,000	\$335	22	207	\$34,300	\$2,450	1,121	164,905
Columbia									82	7,650
Coos					1	8	3,500	240	149	5,900
Curry					1	19	4,000	100	29	1,275
Douglas					1	18	4,000	300	105	5,350
Lane					2	43	13,500	400	38	975
Lincoln									136	4,200
Multnomah					3	35	7,000	1,000	53	1,895
Tillamook									53	4,925
Wasco									1	40
Washington									7	70
Yamhill									6	50
Total	1	59	6,000	335	30	330	66,300	4,490	1,830	198,240

Counties.	Gill nets.			Seines.			Pound nets.		Wheels.	
	No.	Length, feet.	Value.	No.	Length, feet.	Value.	No.	Value.	No.	Value.
Clackamas	68	18,000	\$2,505						2	\$1,500
Clatsop	1,057	986,500	224,525	28	17,910	\$13,900	48	\$35,300		
Columbia	98	77,640	12,840				8	5,600		
Coos	235	126,150	15,275	4	3,600	1,000				
Curry	94	25,320	3,590	3	2,160	600				
Douglas	162	105,930	17,655				1	500		
Lane	80	45,600	7,600	1	1,200	400				
Lincoln	145	58,440	5,925	2	1,500	360				
Multnomah	40	18,720	3,010	4	6,000	2,000	8	3,800	20	49,800
Tillamook	88	76,200	4,675						25	70,000
Wasco				4	3,000	1,650				
Total	2,067	1,538,500	297,700	46	35,370	19,910	65	45,200	47	121,300

Counties.	Fyke nets.		Hoop nets.		Crab pots.		Dip nets.		Guns.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Clackamas			875	\$655						
Clatsop					80	\$80				
Columbia	6	\$60	100	75						
Curry									4	\$100
Lincoln			350	350						
Multnomah	30	300	376	281						
Wasco							12	\$60		
Washington			375	281						
Yamhill			250	187						
Total	36	360	2,325	1,829	80	80	12	60	4	100

Counties.	Value of tongs, rakes, hoes, etc.	Lines, trawl (on vessels).	Shore and accessory property.	Cash capital.	Total investment.
Clackamas			\$1,100		\$6,765
Clatsop	\$63	\$100	\$48,368	\$1,258,000	2,588,526
Columbia			41,400	50,000	117,725
Coos			21,225	34,000	81,140
Curry			35,180	15,000	59,845
Douglas			22,300	16,000	66,105
Lane			13,100	12,000	47,975
Lincoln	128		26,200	26,000	63,163
Multnomah			69,875	105,000	248,961
Tillamook			31,400	30,000	71,000
Wasco			69,100	15,000	155,850
Washington					351
Yamhill					237
Total	191	400	1,174,148	1,561,000	3,497,643

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Table showing, by species and counties, the yield of the fisheries of Oregon in 1899.

Species.	Clackamas.		Clatsop.		Columbia.		Coos.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Cat-fish					9,060	\$181		
Halibut*			17,000	\$1,360				
Herring			12,000	240				
Salmon:								
Blueback			130,760	5,184	18,600	744		
Chinook, fresh	81,550	\$4,078	10,630,342	552,947	505,146	25,257	161,860	\$3,445
Dog			261,796	1,308				
Silver	16,500	495	1,276,577	34,107	18,507	555	890,680	13,937
Steelhead	52,870	2,643	665,338	33,300	9,400	400		
Shad			30,000	300				
Smelt			28,000	340				
Clams			951,510	9,087				
Crabs			31,344	980				
Crawfish	63,000	4,200			5,400	360		
Total	213,920	11,416	14,034,667	639,153	566,113	27,497	1,052,540	17,382

Species.	Curry.		Douglas.		Lane.		Lincoln.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Flounders							3,522	\$53
Herring							7,120	107
Perch							6,360	95
Salmon:								
Chinook, fresh	356,265	\$3,563	64,750	\$1,943	158,040	\$2,766	380,577	6,114
Chinook, salted	2,400	75						
Dog			8,050	41	8,050	40	105,000	525
Silver	113,425	1,134	530,320	10,605	615,610	9,234	922,117	12,277
Steelhead			32,500	1,625			18,034	721
Oysters							59,100	1,625
Clams							27,780	317
Crabs							79,260	1,635
Sea-lion pelts	18,000	720						
Sea-lion oil	750	35						
Sea-lion trimmings		135						
Total	490,840	5,662	635,620	14,215	781,700	12,040	1,608,870	23,499

Species	Multnomah.		Tillamook.		Wasco.		Washington.		Yamhill.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Cat-fish	45,300	\$906								
Salmon:										
Blueback	391,996	13,880			37,827	\$1,485				
Chinook, fresh	927,146	44,714	261,330	\$3,788	217,804	10,598				
Dog	12,339	62	394,380	1,972						
Silver	28,980	1,101	603,815	9,747	137,844	4,088				
Steelhead	252,120	7,095	17,000	340	56,260	1,890				
Shad	2,000	20								
Crawfish	15,000	1,000					15,000	\$1,000	18,000	\$1,200
Total	1,674,881	68,778	1,276,525	15,817	449,735	18,061	15,000	1,000	18,000	1,200

\* Taken in the vessel fisheries.



Table showing, by counties, apparatus of capture, and species, the yield of the fisheries of Oregon in 1899.

Apparatus and species.	Clackamas.		Clatsop.		Columbia.		Coos.		Curry.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Gill nets:										
Salmon:										
Blueback					9,000	\$360				
Chinook	59,400	\$2,970	9,746,278	\$489,346	461,226	22,561	153,960	\$3,283	356,265	\$3,563
Dog			204,160	1,020						
Silver	16,500	495	1,103,565	28,914	18,507	655	795,480	12,223		
Steelhead	29,700	1,485	814,022	15,735	7,000	280				
Smelt			20,000	100						
Total	105,600	4,960	11,388,025	535,115	485,733	23,786	949,440	15,506	356,265	3,563
Seines:										
Herring			12,000	240						
Salmon:										
Blueback			77,448	3,052						
Chinook, fresh			601,604	49,178			7,900	162		
Chinook, salted									2,400	75
Dog			7,000	85						
Silver			22,000	730			95,200	1,714	113,425	1,134
Steelhead			252,656	12,632						
Shad			30,000	300						
Smelt			8,000	240						
Total			1,010,708	66,407			103,100	1,876	115,825	1,209
Pound nets:										
Salmon:										
Blueback			53,312	2,132	9,600	384				
Chinook			282,460	14,423	53,920	2,696				
Dog			50,636	253						
Silver			151,012	4,463						
Steelhead			98,660	4,933	2,400	120				
Total			636,080	26,204	65,920	3,200				
Wheels:										
Salmon:										
Chinook	22,150	1,108								
Steelhead	23,170	1,158								
Total	45,320	2,266								
Fyke nets:										
Cut-fish					9,000	181				
Trawls:										
Halibut*			17,000	1,360						
Hoop nets:										
Crawfish	63,000	4,200			5,400	360				
Crab pots, dip nets and guns:										
Crabs			31,344	980						
Sea-lion pelts									18,000	720
Sea-lion oil									750	35
Sea-lion trimmings										135
Total			31,344	980					18,750	890
Tongs, hoes, etc.:										
Clams			951,510	9,087						
Grand total	213,920	11,416	14,034,667	639,153	566,113	27,497	1,052,540	17,382	490,840	5,662

Apparatus and species.	Douglas.		Lane.		Lincoln.		Multnomah.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Gill nets:								
Herring					7,120	\$107		
Salmon:								
Blueback							52,501	\$1,575
Chinook	54,600	\$1,641	138,040	\$2,416	342,952	5,693	114,217	5,219
Dog			8,050	40	105,000	525	510	3
Silver	495,350	9,907	555,610	8,334	834,442	11,364	5,598	167
Steelhead	32,500	1,625			18,034	721	29,769	1,101
Total	582,540	13,173	701,700	10,790	1,307,548	18,410	202,598	8,065

\* Taken in the vessel fisheries.

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Table showing, by counties, apparatus of capture, and species, the yield of the fisheries of Oregon in 1899—Continued.

Apparatus and species.	Douglas.		Lane.		Lincoln.		Multnomah.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Seines:</b>								
Flounders.....					3,622	\$53		
Perch.....					6,360	96		
<b>Salmon:</b>								
Blueback.....							94,055	\$2,822
Chinook, fresh.....			20,000	\$350	37,625	421	121,350	5,224
Dog.....							418	2
Silver.....			60,000	900	87,675	913	575	14
Steelhead.....							26,852	806
<b>Total.....</b>			<b>80,000</b>	<b>1,250</b>	<b>135,182</b>	<b>1,482</b>	<b>243,250</b>	<b>8,868</b>
<b>Pound nets:</b>								
<b>Salmon:</b>								
Chinook.....	10,060	\$302					30,000	1,500
Dog.....	8,050	41					3,668	18
Silver.....	34,970	699					19,806	845
Steelhead.....							17,624	849
<b>Total.....</b>	<b>53,080</b>	<b>1,042</b>					<b>70,998</b>	<b>3,212</b>
<b>Wheels:</b>								
<b>Salmon:</b>								
Blueback.....							245,437	9,483
Chinook.....							661,679	32,771
Dog.....							7,843	39
Silver.....							3,001	75
Steelhead.....							177,875	4,339
Shad.....							2,000	20
<b>Total.....</b>							<b>1,097,735</b>	<b>46,727</b>
<b>Fyke nets:</b>								
Cat-fish.....							45,300	906
<b>Hoop nets:</b>								
Crabs.....					79,260	1,635		
Crawfish.....							15,000	1,000
<b>Tongs, hoes, etc.:</b>								
Clams.....					27,780	347		
Oysters.....					59,100	1,625		
<b>Total.....</b>					<b>86,880</b>	<b>1,972</b>		
<b>Grand total ..</b>	<b>635,620</b>	<b>14,215</b>	<b>781,700</b>	<b>12,040</b>	<b>1,608,870</b>	<b>23,499</b>	<b>1,674,881</b>	<b>68,778</b>

Apparatus and species.	Tillamook.		Wasco.		Washington.		Yamhill.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Gill nets:</b>								
<b>Salmon:</b>								
Chinook.....	261,330	\$3,788						
Dog.....	394,380	1,972						
Silver.....	603,815	9,747						
Steelhead.....	17,000	340						
<b>Total.....</b>	<b>1,276,525</b>	<b>15,847</b>						
<b>Seines:</b>								
<b>Salmon:</b>								
Chinook, fresh.....			88	\$4				
Silver.....			114,183	3,415				
Steelhead.....			478	14				
<b>Total.....</b>			<b>114,749</b>	<b>3,433</b>				
<b>Wheels:</b>								
<b>Salmon:</b>								
Blueback.....			37,827	1,485				
Chinook.....			205,716	10,114				
Silver.....			23,661	673				
Steelhead.....			55,782	1,876				
<b>Total.....</b>			<b>322,986</b>	<b>14,148</b>				
<b>Hoop nets:</b>								
Crawfish.....					15,000	\$1,000	18,000	\$1,200
<b>Dip nets:</b>								
Salmon, chinook.....			12,000	480				
<b>Grand total ..</b>	<b>1,276,525</b>	<b>15,847</b>	<b>449,735</b>	<b>18,061</b>	<b>15,000</b>	<b>1,000</b>	<b>18,000</b>	<b>1,200</b>

Summary, by apparatus, of the yield of the fisheries of Oregon in 1899.

Apparatus and species.	Lbs.	Value.	Apparatus and species.	Lbs.	Value.
Gill nets:			Wheels:		
Herring .....	7, 120	\$107	Salmon:		
Salmon:			Blueback .....	283, 264	\$10, 968
Blueback .....	61, 504	1, 935	Chinook .....	889, 445	43, 993
Chinook .....	11, 678, 358	540, 480	Dog .....	7, 843	39
Dog .....	712, 100	3, 560	Silver .....	26, 662	748
Silver .....	4, 428, 867	81, 706	Steelhead .....	256, 827	7, 373
Steelhead .....	448, 025	21, 287	Shad .....	2, 000	20
Smelt .....	20, 000	100	Total .....	1, 466, 041	63, 141
Total .....	17, 355, 974	649, 175	Fyke nets:		
Seines:			Cat-fish .....	54, 360	1, 087
Flounders .....	3, 522	53	Trawls:		
Herring .....	12, 000	240	Halibut .....	17, 000	1, 360
Perch .....	6, 360	95	Hoop nets:		
Salmon:			Crabs .....	79, 260	1, 636
Blueback .....	171, 503	5, 874	Crawfish .....	116, 400	7, 760
Chinook, fresh .....	788, 567	55, 339	Total .....	195, 660	9, 395
Chinook, salted .....	2, 400	75	Crab pots, dip nets, guns:		
Dog .....	7, 418	37	Crabs .....	31, 344	980
Silver .....	493, 058	8, 820	Salmon, chinook .....	12, 000	480
Steelhead .....	279, 986	13, 452	Sea-lion pelts .....	18, 000	720
Shad .....	30, 000	300	Sea-lion oil .....	750	35
Smelt .....	8, 000	240	Sea-lion trimmings .....		135
Total .....	1, 802, 814	84, 525	Total .....	62, 094	2, 350
Pound nets:			Tongs, hoes, etc.:		
Salmon:			Clams .....	979, 290	9, 434
Blueback .....	62, 912	2, 516	Oysters .....	59, 100	1, 625
Chinook .....	376, 440	18, 921	Total .....	1, 038, 390	11, 059
Dog .....	62, 254	312	Grand total .....	22, 818, 411	855, 750
Silver .....	205, 788	6, 007			
Steelhead .....	118, 684	5, 902			
Total .....	826, 078	33, 658			

*Clatsop County.*—This county has many natural advantages for the prosecution of the fisheries. Located at the outlet of the Columbia River, and bounded on the west by the Pacific Ocean, it is near valuable fishing grounds, with rail and water facilities for shipment. For many years the business, which centered at Astoria, was almost exclusively based on the salmon. Before the Alaska salmon fisheries were developed Astoria was the headquarters of the canned-salmon business of the United States. Of late years the industry has declined with the catch of salmon, although capital has been freely used and an increased quantity of apparatus employed in the endeavor to regain the former amount of business.

The following tables show the capital and products of Clatsop County for 1899 as compared with those of 1895:

Items.	1895.	1899.
Capital .....	\$1, 809, 100	\$2, 583, 526
Value of products .....	\$1, 040, 480	\$639, 153
Employees .....	3, 908	3, 470

The following shows the Clatsop County fishery products and their first value:

Species.	1895.		1899.	
	Lbs.	Value.	Lbs.	Value.
Salmon .....	26,548,262	\$1,027,132	12,964,813	\$626,846
Smelt .....	31,125	1,245	28,000	340
Shad .....	35,000	350	30,000	300
Herring .....			12,000	240
Halibut .....			17,000	1,360
Sturgeon .....	56,380	1,446		
Crabs .....	23,520	637	31,344	980
Clams .....	234,500	2,010	951,510	9,087
Crawfish .....	2,800	160		
Seals .....		7,500		
Total .....	26,931,587	1,040,480	14,034,667	639,153

The cases of salmon packed were as follows:

Year.	No. of canneries.	Cases.	Value.
1895 .....	11	387,013	\$1,917,073
1899 .....	9	206,889	1,128,905

Two small fish scrap and oil establishments at Astoria collect the refuse from some of the canneries. These plants represent \$43,200 capital, employing 35 men, and in 1899 produced 19,600 gallons of salmon oil of \$4,130 value, and 140 tons of fish scrap for fertilizer, valued at \$3,000. Only a small portion of the refuse from the canneries of the river has ever been saved.

A small proportion of the salmon cans used are hand-made at the canneries, but most of them are made at large factories. The can factory at Astoria represents \$350,000 capital, and employs 125 persons. During 1899 the factory used 60,000 cases of tin plate, all of domestic make. Twenty-two million salmon cans were made in 8 sizes and 16 varieties. A large stock of cans is kept on hand to supply orders from the canneries of Oregon, Washington, and Alaska.

Clams and crabs are quite plentiful along the beaches of Clatsop County near the mouth of the Columbia. Since the jetties were built some 4 miles of beach have been made connecting with 13 miles of the old beach, on which razor clams are plentiful. A few soft-shell clams had previously been found on the old beaches, and clams are reported as rapidly increasing near the jetties.

The razor clams canned, are minced, cooked, and packed in their own liquor. They have been much in demand, being shipped as far east as Chicago. During 1899, 7,143 bushels of clams were used at the cannery and 6,450 bushels were shipped in the shell; the 13,593 bushels giving the 25 clam diggers \$9,087. Five thousand cases of canned clams, of \$27,750 value, were marketed.

Crabs taken from the same beaches numbered 1,306 dozen, or 31,344 pounds, valued at \$980.

*Columbia County.*—The fisheries of this county are confined almost exclusively to the salmon catch from the Columbia, of which 551,653 pounds were taken in 1899, against 923,268 pounds in 1895. The fisheries of the county were also reduced by the prohibition of sturgeon fishing, the catch of which in 1895 amounted to 762,027 pounds. The total value of the products in 1895 amounted to \$50,150, and in 1899 to \$27,497, all of which went to canneries and fresh-fish dealers.

*Multnomah County.*—The fisheries of this county center at Portland, where there is a large amount of capital invested in salmon canneries located in Alaska, Washington, and Oregon. There were only two canneries in operation in Multnomah County in 1899. The fisheries of the county in 1899 amounted to 1,674,881 pounds, of \$68,778 value, with \$243,961 capital invested and 355 fishermen and shore employees engaged. The two canneries packed 44,757 cases of salmon, valued at \$228,237. The products of the fisheries of the county are almost exclusively salmon from the Columbia River.

The wholesale fresh-fish business of Portland yearly increases, the receipts being from Oregon and Washington, with a limited amount from California. The distributions have a wide range, covering a large home and surrounding country demand, with quite large shipments of frozen and pickled salmon to the Atlantic and European markets. This branch of the fisheries represents \$182,500 capital, with 50 employees. The sales for 1899 amounted to 3,332,141 pounds, of \$254,976 value, as follows:

Species.	Lbs.	Value.	Species.	Lbs.	Value.
Black cod, fresh .....	29,172	\$1,605	Halibut, smoked .....	2,926	\$234
Black bass, fresh .....	1,575	157	Herring, smoked .....	8,305	1,496
Cat-fish, fresh .....	77,678	4,929	Herring, salted .....	19,000	755
Carp, fresh .....	30,000	450	Salmon, smoked .....	24,014	1,921
Flounders, fresh .....	25,784	1,284	Salmon, salted .....	522,311	48,231
Halibut, fresh .....	378,001	18,900	Crawfish .....	117,696	19,556
Herring, fresh .....	31,860	1,276	Crabs .....	14,596	606
Perch, fresh .....	49,279	2,414	Shrimp .....	2,000	260
Rock-fish, fresh .....	2,000	80	Spiny lobsters .....	2,000	250
Salmon, fresh .....	1,578,096	91,669	Native oysters .....		30,826
Shad, fresh .....	86,497	1,785	Eastern oysters .....		3,237
Smelt, fresh .....	310,171	9,306	Clams .....		12,600
Sturgeon, fresh .....	10,085	759			
Striped bass, fresh .....	933	93			
Tomcod, fresh .....	8,162	408			
			Total .....	3,332,141	254,976

The crawfish business has largely increased of late years, and forms quite an item in receipts at Portland, amounting to 39,232 dozen, or 117,696 pounds. The catch is made in the sloughs of the Columbia and its tributary streams between March and September. A large part of the catch is used at Portland, with a considerable demand from Seattle, Tacoma, San Francisco, and as far east as Salt Lake City and St. Louis. The average weight is 3 pounds to the dozen. As prepared for shipment the crawfish is placed alive in a preparation of white wine and spices and boiled for about ten minutes. The crawfish and the liquor in which it has been boiled are next packed in tin buckets holding from 2 to 3 dozen each.

*Wasco County.*—This county is bounded on the north by the Columbia River, and is between 200 and 300 miles from its mouth. Salmon were formerly very plentiful in this section, and the Indians largely resorted here for their winter supply of fish food. Later, canneries were established, and with the constantly increased apparatus within 100 miles of the mouth of the stream, the fish reaching Wasco County were much reduced in numbers. The total catch of salmon during 1899 amounted to only 449,735 pounds, of \$18,061 value. The Indian catch, which is made by dip-nets, amounted to only 12,000 pounds. Nearly all of the catch was taken by fish wheels, 25 of which were used; many of them, not taking enough to pay expenses, were abandoned early in the season. The capital invested in wheels and other property, including two canneries, amounted to \$155,850, and gave employment to 85 fishermen and cannerymen. The two canneries packed only 7,610 cases of salmon, of \$35,863 value.

The fish products of the county all came from the Columbia River, and comprised only salmon, most of which went to the cannerymen, a small amount being sent to the fresh-fish markets.

The small amount of fishing in the Columbia River above Wasco County is limited to ranchers and Indians living near its shores, who fish occasionally for their own use.

*Clackamas County.*—In 1899 the products of the fisheries of this county consisted of 150,920 pounds of salmon, of \$7,216 value, caught in the Willamette River, and 63,000 pounds of crawfish from its tributaries. The few miles of the river between Oregon City and Portland and a few miles between the latter and the entrance of the river into the Columbia comprise the fishing-grounds. The capital invested is small, being \$6,765; 106 men follow the fisheries for a small portion of the year. The catch is sold locally and to the Portland market. Within this short reach of fishing-ground shad are said to spawn and at times are plentiful. Carp are also numerous, but neither of these species brings enough to induce the fishermen to save those found in their nets.

The falls of the river at Oregon City probably prevent the passing of fish, as there are no commercial fisheries above that point.

*Tillamook County.*—This county has many small mountain streams entering the Pacific Ocean, which forms its western boundary. They receive quite a run of fall salmon and are more or less supplied with trout. The fisheries are limited to the salmon catch from the Tillamook, Nehalem, and Nestucco rivers, on each of which is located one cannery. In 1899 the salmon packed at the three canneries amounted to 25,933 cases, of \$91,074 value.

*Lincoln County.*—Several rivers in this county have fall runs of salmon. There are fishing-grounds near the harbor of Yaquina that are known to abound with numerous varieties of salt-water fish, but have not been worked except experimentally. The present business is

chiefly confined to salmon used by the canners, a limited amount of fresh fish, crabs, and oysters going to the neighboring fresh-fish markets.

Siletz River has one cannery that packed 4,719 cases of salmon of \$19,146 value; Alsea River one cannery, 7,160 cases of salmon of \$28,176 value; Yaquina River two canneries, 4,850 cases of \$17,124 value; a total by the four canneries of Lincoln County of 16,729 cases of \$64,446 value.

Shipments of fresh salmon, flounders, and herring by express from Yaquina amounted to 107,627 pounds. Crabs are quite plentiful; 79,260 pounds of \$1,635 value were disposed of locally and to the near-by markets.

Yaquina Bay has the only oyster-grounds of Oregon. The beds of native oysters are limited to only a few acres and produce but a small quantity. The total oyster products for 1899 amounted to only 591 sacks of 100 pounds each, valued at \$1,625.

The fisheries of Lincoln County represented a capital of \$63,163, and employed 234 fishermen and 101 cannery-hands. The fish sold to the canneries and fresh-fish markets amounted to 1,442,730 pounds, which, with oysters, clams, and crabs, yielded the fishermen \$23,499.

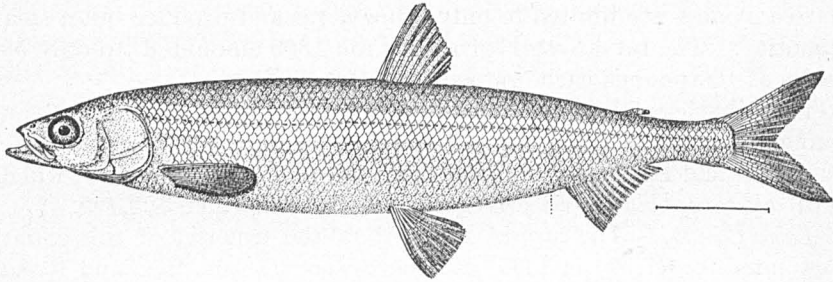
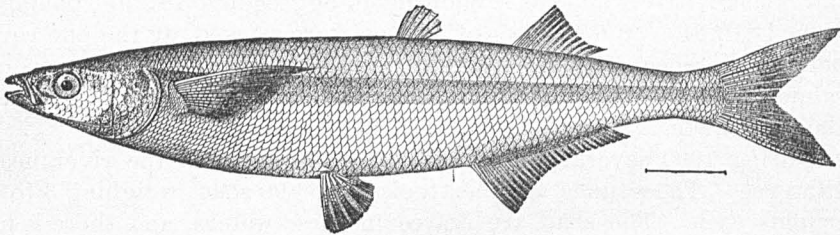
*Lane County.*—The capital invested in the fisheries of this county amounted to \$47,975 in 1899, and there were 95 fishermen and 46 cannery employees. The fisheries are based on the fall run of salmon in the Siuslaw River, and the salmon taken aggregated 781,700 pounds, valued \$12,040. 8,600 cases of salmon were packed by the one cannery at Florence, near the mouth of the Siuslaw River; 399 barrels of salmon were salted, and 60,000 pounds of salmon were sold fresh to the local trade.

During 1900 several pound nets were put down in the river near Florence. The pounds at times took 50 to 100 shad, weighing 3 to 5 pounds each. The shad are scarce in these waters, and there is no market for those taken.

*Douglas County.*—The capital invested in the fisheries of this county, including the value of two salmon canneries, amounted to \$66,105; 207 fishermen and 50 cannery hands were employed. The business was confined to the fall run of salmon, of which the two canneries used 603,120 pounds, packing 8,616 cases, valued at \$31,211. 32,500 pounds of steelhead were sent by express to Portland, making a total catch of 635,620 pounds, of \$14,215 value to the fishermen. A few shad were taken during the season in a pound net near the mouth of the river.

*Coos County.*—The fisheries here were restricted to the salmon of the Coquille River and Coos Bay and River. One cannery at Parkersburg on the Coquille and two at Coos Bay utilized the entire catch, amounting to 1,052,540 pounds of salmon. The pack of the three canneries amounted to 11,947 cases of \$44,518 value. The capital invested in the fisheries was \$81,140; 322 fishermen and 105 cannery-hands were employed.

*Curry County.*—This county is bounded on the west by the Pacific Ocean and on the south by California. At points along the coast good fishing-grounds have been located and were used for a brief time, but there are no favorable shipping facilities. Numerous streams are the spawning grounds of salmon. Rogue River is the largest and most important stream, and has a spring and fall run of salmon. A cannery at Wedderburn near the mouth of the river utilizes the principal part of the salmon taken. Between 1880 and 1890 the annual pack was between 15,000 and 20,000 cases of salmon; in 1889, 21,196; 1890, 19,106; 1891, 19,960. A few miles above Wedderburn is a private fish hatchery, and higher up the stream is the hatchery of the U. S. Fish

SURF SMELT (*Hypomcys pretiosus*).CALIFORNIA SMELT (*Atherinopsis californiensis*.)

Commission. During 1899 the lower station hatched and planted in the river 1,500,000 salmon, the eggs having been furnished by the Government station. In 1893 the private hatchery was destroyed by fire, and soon after a marked decrease was noticed in the salmon run. The catch continued to decrease up to 1899, when the pack amounted to only 7,226 cases, less than half that of former years. With the rebuilding of the private hatchery, and with one owned by the Government, it is hoped that Rogue River will again have its abundance of salmon and that other streams of the State will also be benefited.

The capital invested in the fisheries of Curry County in 1899 amounted to \$59,845, and 56 fishermen and 59 cannery hands were employed. The products were 472,090 pounds of salmon, packing 7,226 cases, valued at \$37,125.



Sea lions are quite numerous along the coast, and the steamer of the cannery has been used in pursuing and killing them, to lessen their alleged destruction of salmon. A few men of Port Orford hunted sea lions for their oil and pelts. The animals were shot on the rocks between Cape Blanco and Port Orford, from 4 to 8 gallons of oil being taken from a lion of full growth. The hunters also collected eggs of murrees or guillemots from the rocky cliffs near Port Orford. In 1899 1,300 dozen eggs were collected and shipped to San Francisco. The eggs were worth \$234 and the sea lions \$890.

FISHERIES OF CALIFORNIA.

Nearly all branches of the fisheries of this State show a steady gain in investment and yield during the past four years, the aggregate capital, value of products, and number of employees being as follows:

Items.	1895.	1899.
Capital.....	\$2,612,298	\$2,774,498
Value of products.....	\$1,786,483	\$2,551,451
Employees.....	4,770	3,974

The gain in capital was \$162,195, and in value of products \$764,968.

The three following tables show the number of persons employed, the apparatus and capital, and the products of the fisheries of California in 1899:

Table of persons employed.

How employed.	No.
On vessels fishing.....	885
On vessels transporting.....	57
In shore fisheries.....	2,538
On shore, in canneries, etc.....	494
Total.....	3,974

Table of apparatus and capital.

Items.	No.	Value.	Items.	No.	Value.
Vessels, fishing.....	33	\$700,870	Apparatus—shore fisheries:		
Tonnage.....	5,952		Paranzella nets.....	10	\$1,000
Outfit.....		418,287	Hoop nets.....	1,637	3,074
Vessels, transporting.....	15	56,800	Trammel nets.....	691	26,280
Tonnage.....	834		Shrimp nets.....	1,370	27,800
Outfit.....		4,220	Lobster pots.....	578	664
Boats.....	1,355	160,335	Forks, spades, rakes, hoes, etc.....		156
Apparatus—vessel fisheries:			Diving outfit.....		3,000
Seines.....	2	2,000	Guns and harpoons.....		322
Beam trawls.....	4	1,400	Lines, hand and trawl.....		4,140
Guns.....		200	Shore and accessory property.....		820,650
Lines.....		100	Cash capital.....		379,700
Apparatus—shore fisheries:			Total.....		2,774,498
Seines.....	118	11,230			
Gill nets.....	1,979	166,841			
Fyke nets.....	356	1,424			

Table of products.

Species.	Lbs.	Value.	Species.	Lbs.	Value.
Albacore or tunny, fresh	49,202	\$1,327	Sea bass, salted	14,000	\$540
Albacore, salted	65,000	2,600	Sea trout	50,068	1,459
Anchovies	6,826	177	Shad	1,137,801	14,303
Barracuda, fresh	957,420	23,220	Skate	11,000	110
Barracuda, salted	234,086	9,483	Smelt	1,315,249	58,064
Bonito, fresh	50,737	1,133	Sole	32,246	646
Bonito, salted	69,000	2,760	Split-tail	131,926	2,639
Carp	283,514	12,400	Striped bass	1,234,320	61,814
Cat-fish	465,911	12,734	Sturgeon	205,659	11,426
Cod, salted	5,917,131	178,054	Surf-fish	116,290	2,576
Croakers	40,919	1,123	Tomcod	375,538	6,882
Cultus-cod	147,890	3,298	White-fish	50,800	1,097
Flounders, fresh	4,666,215	90,659	Yellow-fin	24,000	480
Flounders, salted	20,090	1,104	Yellow-tail, fresh	75,544	1,513
Hake or white-fish	7,210	72	Yellow-tail, salted	129,100	5,164
Halibut	9,000	270	Abalone, dried	369,411	22,813
Hardhead	185,882	5,849	Abalone, shells	525,453	9,743
Herring, fresh	1,620,473	17,167	Clams, hard <sup>1</sup>	636,534	9,087
Herring, salted	16,539	516	Clams, soft <sup>2</sup>	1,531,400	21,958
Jew-fish, fresh	36,000	751	Oysters, eastern <sup>3</sup>	25,200,000	792,000
Jew-fish, salted	30,000	1,200	Oysters, native <sup>4</sup>	3,600,000	75,000
King-fish	127,198	4,483	Mussels	364,076	8,637
Mackerel, fresh	139,666	5,855	Scallops	3,939	738
Mackerel, salted	14,000	560	Crabs	3,676,680	85,784
Mullet	22,000	610	Spiny lobsters	606,713	14,198
Octopus	5,000	50	Shrimp, dried	698,625	69,862
Perch, fresh	429,485	10,657	Shrimp in shells	903,375	36,135
Perch, salted	3,000	120	Shrimp shells	2,445,186	4,889
Pike	16,005	639	Squid, dried	622,740	18,682
Pompano	13,135	4,457	Frogs	20,687	20,638
Rock-fish, fresh	1,177,980	35,955	Terrapin	107,869	10,376
Rock-fish, salted	64,830	2,231	Whalebone	207,392	436,272
Salmon:			Whale oil <sup>5</sup>	507,300	20,191
Blueback	21,600	755	Seal oil	5,250	210
Chinook, fresh	7,084,885	255,249	Sea-lion pelts	13,000	612
Chinook, salted	3,000	210	Algæ	35,824	896
Silver	60,160	2,105	Sea-otter pelts		1,000
Steelhead	113,600	3,876	Trade furs		3,422
Sardines	2,383,000	17,790	Other products	96,276	3,070
Sculpin	3,000	75			
Sea bass, fresh	924,166	19,952			
			Total	74,559,019	2,551,451

<sup>1</sup> 10,609 bushels.    <sup>2</sup> 21,920 bushels.    <sup>3</sup> 360,000 bushels.    <sup>4</sup> 60,000 bushels.    <sup>5</sup> 67,628 gallons.

The increase in the general fish business of 1899 over that of 1895 amounted to 9,439,829 pounds and \$383,888 in value, the most noticeable gain being in striped bass. In crabs there is an increase of 1,111,680 pounds and \$24,034 in value, the remainder of the increase being in oysters, spiny lobsters, whalebone, and other products. The products of the seal fisheries in 1895 amounted to \$116,785 in value. On account of the suspension of pelagic sealing there is to be noted a decrease in the employees and an absence of seal products in 1899.

The shrimp fisheries are entirely in the hands of Chinese, whose camps are located near the fishing-grounds in San Francisco Bay, as follows: San Pablo, Contra Costa County; San Quentin and Point Pedro, Marin County; Redwood City and Burlingame, San Mateo County; Newark, Alameda County; Hunters Point, San Francisco County. At these stations an aggregate of 158 Chinese work 1,390 shrimp nets. Their headquarters are at San Francisco under the name of the Union Shrimp Company. The capital invested in boats, nets, and shore property amounted to \$45,100. This company employs the fishermen, regulates the amount and preparation of the catch, some of the camps preparing only the hulled shrimp, which are largely used for export.

The total products of the shrimp fishery in 1899, as they came from the water, amounted to 8,115,468 pounds and were disposed of as follows: Boiled and sold with the hulls on, in San Francisco markets, 903,375 pounds, worth \$36,135; cooked, hulled, and dried for foreign and domestic markets, 698,625 pounds, of \$69,862 value. From the latter the shells are saved and sold for fertilizer, 2,445,186 pounds of shells, of \$4,889 value, being disposed of at San Francisco and exported.

The exports of hulled shrimp and of shrimp shells to China have long been of considerable importance. Since the troubles in China the exports have largely fallen off, the year 1899 showing a decrease in the value of the products of \$51,863 as compared with 1895. The total value of the products of 1899 were \$110,886, realized from 4,047,186 pounds of shrimps and shells as placed on the market.

The salmon fisheries of the Sacramento River show a large increase since 1895, those of the northern part of the State, in Humboldt and Del Norte counties, showing a decrease; the aggregate net gain was 2,169,834 pounds. The catch was disposed of mainly to fresh-fish dealers.

The operations in salmon canning for 1895 and 1899 are shown by the following table:

Salmon, canned.	1895.	1899.
	<i>Cases.</i>	<i>Cases.</i>
On Sacramento River.....	25,185	32,580
On Klamath River.....	1,600	1,600
On Smith River.....	2,250	.....
Total pack of the State.....	29,035	34,180

FISHING STATISTICS OF CALIFORNIA BY COUNTIES.

The following tables show, by counties, the detailed statistics of the California fisheries in 1899:

*Table showing the number of persons employed in the fisheries of California in 1899.*

Counties.	On vessels fishing.	On vessels transporting.	In shore fisheries.	On shore, in canneries, etc.	Total.
Alameda.....			36		36
Butte.....			2		2
Contra Costa.....			363	77	440
Del Norte.....			22	30	52
Humboldt.....			182	3	185
Los Angeles.....	7	4	187	100	298
Marin.....			157	57	214
Monterey.....			186	1	187
Orange.....			34		34
Sacramento.....			108	12	120
San Diego.....	14		161	6	181
San Francisco.....	864	41	489	81	1,475
San Joaquin.....			27	6	33
San Luis Obispo.....			26		26
San Mateo.....			30		30
Santa Barbara.....		8	41		49
Santa Cruz.....			74	5	79
Solano.....		4	306	101	411
Ventura.....			6		6
Yolo.....			101	15	116
Total.....	885	57	2,538	494	3,974

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Table showing, by counties, the vessels, boats, apparatus, and property employed in the fisheries of California in 1899.

Counties.	Vessels fishing.				Vessels transporting.				Boats.	
	No.	Ton-nage.	Value.	Value of outfit.	No.	Ton-nage.	Value.	Value of outfit.	No.	Value.
Alameda.....									13	\$340
Butte.....									1	30
Contra Costa.....									173	22,075
Del Norte.....									10	260
Humboldt.....									113	1,760
Los Angeles.....	2	38	\$6,000	\$220	1	12	\$1,500	\$500	143	15,135
Marin.....									34	2,000
Monterey.....									130	11,140
Orange.....									19	620
Sacramento.....									54	2,195
San Diego.....	3	24	1,700	1,354					137	17,000
San Francisco.....	28	5,890	693,170	411,713	9	763	48,200	2,920	194	39,400
San Joaquin.....									21	1,365
San Luis Obispo.....									20	1,730
San Mateo.....									8	600
Santa Barbara.....					3	27	4,900	600	28	1,345
Santa Cruz.....									46	5,460
Solano.....					2	32	1,200	200	153	25,365
Ventura.....									3	150
Yolo.....									57	1,765
Total.....	33	5,952	700,870	413,287	15	834	55,800	4,220	1,355	150,335

Counties.	Apparatus used in the vessel fisheries.						Value of guns.	Value of lines.
	Seines.			Beam trawls.		Value of outfit.		
	No.	Length, feet.	Value.	No.	Value.			
Los Angeles.....	2	1,440	\$2,000					
San Diego.....							\$200	
San Francisco.....				4	\$1,400		\$100	

Counties.	Apparatus used in the shore fisheries.									
	Seines.			Gill nets.			Fyke nets.		Paranzella nets.	
	No.	Length, feet.	Value.	No.	Length, feet.	Value.	No.	Value.	No.	Value.
Butte.....				1	570	\$100				
Contra Costa.....				196	312,300	54,850				
Del Norte.....	1	501	\$175	10	4,500	500				
Humboldt.....	11	6,900	1,725	190	57,000	12,825				
Los Angeles.....	20	6,898	1,455	108	62,820	8,605				
Marin.....	8	2,400	800	114	20,810	3,420				
Monterey.....	20	5,556	2,600	178	58,527	7,852				
Orange.....	8	4,800	715	1	180	35				
Sacramento.....	1	300	50	53	49,050	7,550	75	\$300		
San Diego.....	4	1,320	270	58	10,860	1,046				
San Francisco.....	12	4,320	1,500	465	101,700	10,575			10	\$1,000
San Joaquin.....	7	1,050	350	12	14,400	2,100	56	224		
San Luis Obispo.....				149	11,920	4,080				
Santa Barbara.....				73	11,430	1,775				
Santa Cruz.....	7	3,360	580	150	46,350	6,448				
Solano.....				171	188,820	40,750	25	100		
Ventura.....	2	600	150	5	630	255				
Yolo.....	12	5,760	960	45	26,400	3,875	200	800		
Total.....	113	42,765	11,230	1,979	978,267	166,841	356	1,424	10	1,000

Counties.	Apparatus used in the shore fisheries—continued.								
	Hoop nets.		Trammel nets.			Shrimp nets.		Lobster pots.	
	No.	Value.	No.	Length, feet.	Value.	No.	Value.	No.	Value.
Alameda.....						50	\$1,000		
Contra Costa.....	10	\$20	5	6,000	\$1,000	150	3,000		
Los Angeles.....			107	78,900	13,000			200	\$200
Marin.....			19	4,660	570	520	10,800		
Monterey.....			25	4,500	750				
Orange.....			2	360	40			93	115
San Diego.....			50	12,000	1,000			80	100
San Francisco.....	1,527	3,054	290	69,600	7,250	350	7,000		
San Mateo.....						300	6,000		
Santa Barbara.....			20	3,000	400			175	219
Santa Cruz.....			71	12,780	2,130				
Solano.....			2	840	140				
Ventura.....								80	80
Total.....	1,537	\$3,074	591	192,540	26,280	1,370	27,800	578	664

Table showing, by counties, the vessels, boats, apparatus, and property employed in the fisheries of California in 1899—Continued.

Counties.	Apparatus used in the shore fisheries— continued.				Shore and ac- cessory property.	Cash cap- ital.	Total in- vestment.
	Value of forks, spades, rakes, hoes, etc.	Value of diving outfit.	Value of guns and har- poons.	Value of trawl and hand lines.			
Alameda .....	\$15				\$575		\$1,930
Butte .....					100		230
Contra Costa .....	32				38,600	\$35,000	154,677
Del Norte .....					10,500	3,200	14,635
Humboldt .....	15			\$20	10,300	6,000	32,645
Los Angeles .....	29	\$1,000		912	26,600	36,000	113,356
Marin .....	33			60	67,340		85,013
Monterey .....	22	1,200	\$252	1,015	12,240	6,000	42,971
Orange .....				160	575		2,250
Sacramento .....				20	10,925	10,000	31,040
San Diego .....		800		445	7,575		32,190
San Francisco .....				200	578,900	230,000	2,036,282
San Joaquin .....				30	5,150	2,000	11,219
San Luis Obispo .....	5		70	435	3,200	500	10,020
San Mateo .....					3,000		9,600
Santa Barbara .....				71	3,895	5,000	18,205
Santa Cruz .....	2			707	2,175		17,502
Solano .....				70	33,900	44,000	146,725
Ventura .....	3				50		638
Yolo .....				15	5,050	2,000	14,465
Total .....	156	3,000	322	4,140	820,650	379,700	2,774,493

Table showing, by counties, apparatus, and species, the yield of the vessel fisheries of California in 1899.

Apparatus and species.	Los Angeles.		San Diego.		San Francisco.		Total.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Beam trawls:								
Cultus-cod .....					117,890	\$2,358	117,890	\$2,358
Flounders .....					1,825,455	31,945	1,825,455	31,945
Halibut .....					9,000	270	9,000	270
Hake or white-fish .....					7,210	72	7,210	72
King-fish .....					8,500	127	8,500	127
Octopus .....					5,000	50	5,000	50
Rock-fish .....					11,915	238	11,915	238
Sea bass .....					261,902	5,238	261,902	5,238
Skate .....					11,000	110	11,000	110
Tomcod .....					325,538	4,882	325,538	4,882
Total .....					2,583,410	45,290	2,583,410	45,290
Lines:								
Albacore, salted .....			16,250	\$650			16,250	650
Barracuda, salted .....			50,000	2,000			50,000	2,000
Bonito, salted .....			17,250	690			17,250	690
Cod, salted .....					5,917,131	178,054	5,917,131	178,054
Jew-fish, salted .....			7,500	800			7,500	800
Mackerel, salted .....			3,500	140			3,500	140
Rock-fish, salted .....			5,000	200			5,000	200
Yellow-tail, salted .....			28,500	1,140			28,500	1,140
Total .....			128,000	5,120	5,917,131	178,054	6,245,131	183,174
Seines:								
Sardines .....	1,000,000	\$10,000					1,000,000	10,000
Miscellaneous:								
Sea otter .....				1,000				1,000
Trade furs .....						3,422		3,422
Whalebone .....					207,392	436,272	207,392	436,272
Whale oil .....					471,510	18,998	471,510	18,998
Total .....				1,000	678,902	468,692	678,902	469,692
Grand total .....	1,000,000	10,000	128,000	6,120	9,179,443	682,036	10,307,443	698,156

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Table showing, by counties and species, the yield of the fisheries of California in 1899.

Species.	Alameda.		Butte.		Contra Costa.		Del Norte.		Humboldt.	
	Lbs.	Value.	Lbs.	Val.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Cat-fish					11,100	\$222				
Cultus-cod									4,000	\$120
Flounders, fresh					43,290	666			95,200	2,304
Hardhead					25,740	257				
Herring, fresh									30,000	700
Herring, salted									9,000	290
Perch, fresh									26,000	490
Rock-fish, fresh									20,000	600
Salmon, blueback									21,600	755
Salmon, chinook, fresh			12,000	\$480	2,807,893	99,771	136,000	\$2,340	176,200	5,189
Salmon, silver									60,160	2,105
Salmon, steelhead									113,600	3,876
Sardines									20,000	400
Shad					320,194	4,236				
Smelt									81,000	2,430
Striped bass					575,917	23,449				
Sturgeon			6,654	333	49,860	3,465			2,000	30
Surf-fish									4,000	100
Clams, hard									24,000	600
Clams, soft	612,480	\$8,750			767,300	10,971			1,500	50
Mussels	344,400	3,440								
Crabs									12,000	275
Shrimp, dried	17,719	1,771			88,594	8,859				
Shrimp, in shells	82,125	3,285			409,300	16,372				
Shrimp shells	62,015	124			310,078	620				
Frogs					2,178	2,178			4,000	4,000
Terrapin					17,779	1,796				
Total	1,118,739	17,370	18,654	813	5,429,253	172,862	136,000	2,340	704,160	24,314

Species.	Los Angeles.		Marin.		Monterey.		Napa.		Orange.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Val.	Lbs.	Value.
Albacore or tunny	20,776	\$312			27,015	\$963				
Anchovies					6,826	177				
Barracuda, fresh	388,365	7,812			183,520	5,385			46,000	\$920
Barracuda, salted					22,085	883				
Bonito	12,420	186			9,817	197				
Croakers	11,219	272							9,700	251
Cultus-cod	11,000	220								
Flounders, fresh	1,085,463	26,412			59,730	2,149			89,910	2,268
Flounders, salted					20,090	1,104				
Herring, fresh			20,200	\$101	26,278	526				
Herring, salted					7,539	226				
Jew-fish	22,000	331								
King-fish	35,240	705			6,010	190				
Mackerel	49,240	1,460			65,525	3,332				
Mullet									10,000	250
Perch	70,192	1,562	68,560	1,715	116,832	2,385			5,800	159
Pompano	6,600	990								
Rock-fish, fresh	244,000	5,631	43,600	2,180	424,307	12,744			68,607	1,544
Rock-fish, salted					31,010	1,240				
Salmon, chinook, fresh					224,486	11,184				
Salmon, chinook, salted					3,000	210				
Sardines	1,015,000	10,150								
Sculpin	3,000	75								
Sea bass, fresh	77,675	1,554	102,400	1,536	117,000	3,350				
Sea bass, salted					2,000	60				
Sea trout	27,100	755			20,600	618				
Smelt	163,162	4,794	100,670	4,630	57,024	2,366			25,600	1,068
Surf-fish	64,890	1,238							18,400	368
White-fish	43,100	878								
Yellow-fin	24,000	480								
Yellow-tail, fresh	53,000	1,010			11,813	236			5,000	100
Yellow-tail, salted					15,100	604				
Abalone, dried	63,930	7,622			108,375	5,897				
Abalone, shells	50,185	1,003			63,293	633				
Clams, hard	273,680	2,659	234,735	4,401	28,800	576			19,000	285
Clams, soft			153,120	2,187						
Mussels					18,967	190				
Scallops	3,939	738								
Spiny lobsters	140,886	3,522							57,400	1,435
Shrimp, dried			263,250	26,325						
Shrimp, in shells			411,950	16,478						
Shrimp shells			921,375	1,842						
Squid, dried					622,740	18,682				
Frogs			3,200	3,200	100	60	3,600	\$3,600		
Whale oil					35,790	1,193				
Algae					35,824	896				
Other products					94,316	2,575				
Total	3,960,062	82,871	2,823,060	64,495	2,455,812	80,821	3,600	3,600	855,417	8,648

Table showing, by counties and species, the yield of the fisheries of California in 1899—Continued.

Species.	Sacramento.		San Diego.		San Francisco.		San Joaquin.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Albacore or tunny, salted			65,000	\$2,600				
Barracuda, fresh			154,754	4,642				
Barracuda, salted			200,000	8,000				
Bonito, fresh			7,500	225				
Bonito, salted			69,000	2,760				
Carp	6,339	\$63			174,000	\$1,305	61,275	\$613
Cat-fish	175,031	4,685					76,870	2,721
Cod, salted					5,917,131	178,054		
Croakers			20,000	600				
Cultus-cod					132,890	2,958		
Flounders			125,797	3,774	3,091,455	50,977		
Hake or white-fish					7,210	72		
Halibut					9,000	270		
Hardhead	16,967	581					33,400	1,169
Herring			20,000	600	1,524,000	15,240		
Jew-fish, fresh			14,000	420				
Jew-fish, salted			30,000	1,200				
King-fish			7,000	210	68,500	3,127		
Mackerel, fresh			13,200	396				
Mackerel, salted			14,000	560				
Mullet			12,000	360				
Octopus					5,000	50		
Perch	1,004	173	18,381	552	40,125	1,605		
Pike	905	35					11,800	472
Rock-fish, fresh			185,797	4,074	46,915	1,638		
Rock-fish, salted			20,000	800				
Salmon, chinook	405,733	15,946			56,680	2,227	63,975	2,559
Sardines			20,000	600	1,328,000	6,640		
Sea bass			19,000	570	336,902	6,738		
Shad	1,226	24			619,496	6,195	178,825	3,577
Skate					11,000	110		
Smelt			33,000	990	716,000	35,800		
Split-tail	5,826	117						
Striped bass	113	6			587,200	32,232	12,750	637
Sturgeon	8,880	4,555			63,810	3,420	1,355	67
Surf-fish			21,000	630				
Tomcod					375,538	6,882		
White-fish			6,200	156				
Yellow-tail, salted			114,000	4,560				
Abalone, dried			140,981	7,049				
Abalone, shells			315,340	6,307				
Oysters, Eastern					25,200,000	792,000		
Oysters, native					3,600,000	75,000		
Crabs					3,664,680	86,509		
Spiny lobsters			61,000	1,680				
Shrimps, dried					177,187	17,719		
Shrimp shells					620,156	1,240		
Terrapin							26,460	2,520
Whalebone					207,392	436,272		
Whale oil					471,510	18,998		
Sea-otter pelts				1,000				
Trade furs						3,422		
Total	622,024	22,085	1,655,960	55,315	49,000,777	1,785,700	466,690	14,335

Species.	Solano.		Sonoma.		Stanislaus.		Ventura.		Yolo.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Carp									41,900	\$419
Cat-fish	8,910	\$356							194,000	4,750
Flounders	6,000	180					21,000	\$630		
Hardhead	23,250	814							86,525	3,028
Perch									2,520	344
Pike									3,300	132
Rock-fish							8,000	240		
Salmon, chinook	2,834,878	100,631							278,800	11,188
Shad	18,060	271								
Smelt							6,000	180		
Split-tail									126,100	2,522
Striped bass	108,310	5,490								
Sturgeon	71,080	3,554							2,040	102
Surf-fish							8,000	240		
Clams, hard							16,000	160		
Spiny lobsters							15,000	450		
Terrapin	10,080	360	13,650	\$1,300	39,900	\$3,800				
Total	3,080,568	112,256	13,650	1,300	39,900	3,800	74,000	1,900	735,185	22,485

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Table showing, by counties and species, the yield of the fisheries of California in 1899—Continued.

Species.	San Luis Obispo.		San Mateo.		Santa Barbara.		Santa Clara.		Santa Cruz.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Albacore or tunny	1,411	\$52								
Barracuda, fresh	35,268	1,231			47,900	\$1,198			101,613	\$2,032
Barracuda, salted	12,000	600								
Bonito					21,000	625				
Flounders	9,192	346			27,000	710			12,178	243
King-fish	1,868	69			4,000	100			4,680	92
Mackerel	2,118	78			12,928	323			6,657	266
Perch, fresh	2,822	97			6,000	150			71,249	1,425
Perch, salted	3,000	120								
Pompano									6,535	3,467
Rock-fish, fresh	112,996	4,575			14,800	370			58,958	2,359
Rock-fish, salted	3,820	191								
Salmon, chinook	4,000	320							85,340	3,414
Sea bass, fresh	39,194	1,468			21,300	532			210,685	4,214
Sea bass, salted	12,000	480								
Sea trout	2,368	86								
Smelt	39,597	1,421			7,000	175			86,196	4,310
Sole									32,245	645
White-fish					2,500	63				
Yellow-tail	1,411	52			4,320	115				
Abalone, dried					56,125	2,245				
Abalone shells					96,635	1,800				
Clams, hard	40,015	400							304	6
Mussels									709	7
Spiny lobsters					332,427	7,111				
Shrimp, dried			151,875	\$15,188						
Shrimp shells			531,682	1,063						
Frogs			3,880	3,880			3,400	\$3,400	329	320
Sea-lion oil	5,250	210								
Sea-lion pelts	13,000	612								
Other products		315			1,960	180				
Total	341,330	12,713	687,317	20,131	655,893	15,597	3,400	3,400	677,578	22,800

Table showing, by counties, species, and apparatus of capture, the yield of the shore fisheries of California in 1899.

Apparatus and species.	Los Angeles.		Marin.		Monterey.		Napa.		Orange.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Gill nets:</b>										
Albacore or tunny					6,200	\$224				
Anchovies					6,826	177				
Barracuda, fresh	350,000	\$7,000			140,640	4,099			3,000	\$60
Barracuda, salted					17,000	680				
Flounders, fresh	139,763	3,478			35,494	1,420				
Flounders, salted					20,090	1,104				
Herring, fresh			15,000	\$75	20,000	400				
Herring, salted					7,539	226				
Jew-fish	1,500	23								
King-fish	30,000	600			6,010	180				
Mackerel	16,000	320			12,000	720				
Perch					48,232	965				
Pompano	3,000	450								
Rock-fish, fresh	13,000	293			140,935	4,228				
Rock-fish, salted					10,000	400				
Sardines	15,000	150								
Sea bass, fresh	66,675	1,334	91,080	1,366	117,000	3,350				
Sea bass, salted					2,000	60				
Smelt	79,482	2,284	67,114	3,020	41,904	1,761				
Surf-fish	12,000	180								
White-fish	35,000	700								
Yellow-tail	6,000	120			3,000	60				
Total	767,420	16,932	173,194	4,461	634,870	20,054			3,000	60
<b>Scines:</b>										
Croakers	3,219	72							9,700	251
Flounders					8,306	332			4,000	120
Herring			5,200	26	6,278	126				
King-fish	5,240	105								
Mullet									10,000	250
Perch	40,192	812	51,420	1,286	45,100	950			5,800	159
Pompano	3,000	540								
Smelt	83,680	2,510	33,556	1,510	15,120	605			25,600	1,008
Squid, dried					622,740	18,682				
Surf-fish	52,890	1,058							18,400	368
White-fish	1,500	30								
Total	190,321	5,127	90,176	2,822	697,544	20,695			78,600	2,216



Table showing, by counties, species, and apparatus of capture, the yield of the shore fisheries of California in 1899—Continued.

Apparatus and species.	Los Angeles.		Marin.		Monterey.		Napa.		Orange.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Trammel nets:</b>										
Albacore or tunny.	20,000	\$300								
Bonito	6,000	90								
Croakers	8,000	200								
Cultus-cod	5,000	100								
Flounders	807,000	19,475				7,500	\$60		10,000	\$250
Jew-fish	15,000	225								
Perch	30,000	750	17,140	\$429		23,500	470			
Rock-fish	60,000	1,350				900	36		8,000	180
Sculpin	3,000	75								
Sea bass	11,000	220	11,320	170						
Sea trout	23,000	632								
Yellow-fin	24,000	480								
Yellow-tail	35,000	700								
<b>Total</b>	<b>1,047,000</b>	<b>24,597</b>	<b>28,460</b>	<b>599</b>	<b>31,900</b>	<b>566</b>			<b>18,000</b>	<b>430</b>
<b>Lines, trawl and hand:</b>										
Albacore or tunny.	776	12			20,815	739				
Barracuda, fresh	38,365	812			42,880	1,286			48,000	860
Barracuda, salted					5,085	203				
Bonito	6,420	96			9,817	197				
Cultus-cod	6,000	120								
Flounders	138,700	3,469			8,430	337			75,910	1,898
Jew-fish	5,500	83								
Mackerel	33,240	1,140			43,525	2,612				
Rock-fish, fresh	171,000	3,988	43,600	2,180	282,472	8,480			60,607	1,364
Rock-fish, salted					21,010	840				
Salmon, chinook, fresh										
Salmon, chinook, salted					224,486	11,184				
Sea trout	4,100	123			3,000	210				
White-fish	6,600	148			20,600	618				
Yellow-tail, fresh	12,000	190			8,818	176			5,000	100
Yellow-tail, salted					15,100	604				
<b>Total</b>	<b>422,701</b>	<b>10,171</b>	<b>43,600</b>	<b>2,180</b>	<b>706,033</b>	<b>27,486</b>			<b>184,517</b>	<b>4,222</b>
<b>Pots:</b>										
Spiny lobsters	140,886	3,522							57,400	1,435
<b>Shrimp nets:</b>										
Shrimps in shells			411,950	16,478						
Shrimps, dried			263,250	26,325						
Shrimp shells			921,375	1,842						
<b>Total</b>			<b>1,596,575</b>	<b>44,645</b>						
<b>Tongs, rakes, forks, etc.:</b>										
Scallops	3,939	738								
Clams, hard	273,680	2,659	234,735	4,401	28,800	576			19,000	285
Clams, soft			153,120	2,187						
Mussels					18,967	190				
<b>Total</b>	<b>277,619</b>	<b>3,397</b>	<b>387,855</b>	<b>6,588</b>	<b>47,767</b>	<b>766</b>			<b>19,000</b>	<b>285</b>
<b>Miscellaneous apparatus:</b>										
Abalone, dried	63,930	7,622			108,375	5,897				
Abalone, shells	50,185	1,003			63,293	633				
Algae					35,824	896				
Frogs			3,200	3,200	100	60	3,600	\$3,600		
Whale oil					35,790	1,193				
Other products					94,316	2,575				
<b>Total</b>	<b>114,115</b>	<b>8,625</b>	<b>3,200</b>	<b>3,200</b>	<b>337,698</b>	<b>11,254</b>	<b>3,600</b>	<b>3,600</b>		
<b>Grand total</b>	<b>2,960,062</b>	<b>72,371</b>	<b>2,323,060</b>	<b>64,495</b>	<b>2,465,812</b>	<b>80,821</b>	<b>3,600</b>	<b>3,600</b>	<b>355,417</b>	<b>8,642</b>

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Table showing, by counties, species, and apparatus of capture, the yield of the shore fisheries of California in 1899—Continued.

Apparatus and species.	San Luis Obispo.		San Mateo.		Santa Barbara.		Santa Clara.		Santa Cruz.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Gill nets:</b>										
Albacore or tunny	1,411	\$52								
Barracuda, fresh	31,332	1,073			35,900	\$895			101,613	\$2,032
Barracuda, salted	12,000	600								
Flounders	9,192	346			10,800	304				
King-fish	1,868	69							4,580	92
Mackerel	2,118	78							6,657	266
Perch, fresh	2,822	97								
Perch, salted	3,000	120							4,495	2,447
Pompano										
Rock-fish					1,800	45				
Sea trout	2,368	96								
Sea bass, fresh	31,321	1,133			21,300	532			210,685	4,214
Sea bass, salted	12,000	480								
Smelt	39,597	1,421			7,000	175			86,196	4,310
Yellow-tail	1,411	52								
<b>Total</b>	<b>150,440</b>	<b>5,607</b>			<b>76,800</b>	<b>1,954</b>			<b>414,226</b>	<b>13,361</b>
<b>Selnes:</b>										
Pompano									2,040	1,020
<b>Trammel nets:</b>										
Bonito					15,000	375				
Flounders					13,100	928			12,178	243
King-fish					4,000	100				
Mackerel					5,176	129				
Perch					6,000	150			68,674	1,373
Rock-fish									28,158	1,126
Shad									32,245	645
White-fish					2,500	63				
Yellow-tail					2,520	63				
<b>Total</b>					<b>48,296</b>	<b>1,208</b>			<b>141,255</b>	<b>3,387</b>
<b>Lines, trawland hand:</b>										
Barracuda	3,936	158			12,000	300				
Bonito					6,000	150				
Flounders					3,100	78				
Mackerel					7,760	194				
Perch									2,675	52
Rock-fish, fresh	112,996	4,575			13,000	325			30,800	1,233
Rock-fish, salted	3,820	191								
Salmon, chinook	4,000	320							85,940	3,414
Sea bass	7,873	325								
Yellow-tail					1,800	52				
<b>Total</b>	<b>132,625</b>	<b>5,569</b>			<b>43,650</b>	<b>1,099</b>			<b>118,715</b>	<b>4,699</b>
<b>Pots:</b>										
Spiny lobsters					332,427	7,111				
<b>Shrimp nets:</b>										
Shrimp, dried			151,875	\$15,188						
Shrimp, shells			531,562	1,063						
<b>Total</b>			<b>683,437</b>	<b>16,251</b>						
<b>Tongs, rakes, forks, etc.:</b>										
Clams, hard	40,015	400							304	6
Mussels									709	7
<b>Total</b>	<b>40,015</b>	<b>400</b>							<b>1,013</b>	<b>13</b>
<b>Miscellaneous apparatus:</b>										
Abalone, dried					56,125	2,245				
Abalone, shells					96,635	1,800				
Frogs			3,880	3,880			3,400	\$3,400	329	320
Sea-lion pelts	13,000	612								
Sea-lion oil	5,250	210								
Sea-lion trimmings		315								
Other products					1,960	180				
<b>Total</b>	<b>18,250</b>	<b>1,137</b>	<b>3,880</b>	<b>3,880</b>	<b>154,720</b>	<b>4,225</b>	<b>3,400</b>	<b>3,400</b>	<b>329</b>	<b>320</b>
<b>Grand total</b>	<b>341,330</b>	<b>12,713</b>	<b>687,317</b>	<b>20,131</b>	<b>655,893</b>	<b>15,597</b>	<b>3,400</b>	<b>3,400</b>	<b>677,578</b>	<b>22,800</b>

Table showing, by counties, species, and apparatus of capture, the yield of the shore fisheries of California in 1899—Continued.

Apparatus and species.	Alameda.		Butte.		Contra Costa.		Del Norte.		Humboldt.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Gill nets:</b>										
Flounders, fresh					3,290	\$66				
Herring, fresh									10,000	\$100
Salmon, chinook			12,000	\$480	2,807,893	99,771	112,000	\$2,100	138,600	3,876
Salmon, silver									48,160	1,685
Salmon, blueback									19,100	668
Salmon, steelhead									113,600	3,876
Sardines									10,000	100
Shad					218,994	2,212				
Smelt									80,000	2,400
Striped bass					575,147	23,409				
Sturgeon			6,654	333	49,860	3,465				
<b>Total</b>			<b>18,654</b>	<b>813</b>	<b>3,655,184</b>	<b>128,923</b>	<b>112,000</b>	<b>2,100</b>	<b>419,460</b>	<b>12,705</b>
<b>Seines:</b>										
Flounders									73,200	1,424
Herring, fresh									20,000	600
Herring, salted									9,000	290
Pereh									26,000	490
Salmon, chinook							24,000	240	37,500	1,313
Salmon, silver									12,000	420
Salmon, blueback									2,500	87
Sardines									10,000	300
Smelt									1,000	30
Sturgeon									2,000	30
Surf-fish									4,000	100
Crabs									12,000	275
<b>Total</b>							<b>24,000</b>	<b>240</b>	<b>209,200</b>	<b>5,359</b>
<b>Trammel nets:</b>										
Flounders					40,000	600				
Shad					101,200	2,024				
Striped bass					800	40				
<b>Total</b>					<b>142,000</b>	<b>2,664</b>				
<b>Lines, trawl and hand:</b>										
Cultus-ood									4,000	120
Flounders									22,000	880
Rock-fish, fresh									20,000	600
<b>Total</b>									<b>46,000</b>	<b>1,600</b>
<b>Hoop nets:</b>										
Cat-fish					11,100	222				
Hardhead					25,740	257				
<b>Total</b>					<b>36,840</b>	<b>479</b>				
<b>Shrimp nets:</b>										
Shrimp, in shells	82,125	\$3,285			409,300	16,372				
Shrimp, dried	17,719	1,771			88,594	8,859				
Shrimp shells	62,015	124			310,078	620				
<b>Total</b>	<b>161,859</b>	<b>5,180</b>			<b>807,972</b>	<b>25,851</b>				
<b>Tongs, rakes, forks, etc.:</b>										
Clams, hard									24,000	600
Clams, soft	612,480	8,760			767,300	10,971			1,500	50
Mussels	344,400	3,440								
<b>Total</b>	<b>956,880</b>	<b>12,190</b>			<b>767,300</b>	<b>10,971</b>			<b>25,500</b>	<b>650</b>
<b>Miscellaneous apparatus:</b>										
Frogs					2,178	2,178			4,000	4,000
Terrapin					17,779	1,796				
<b>Total</b>					<b>19,957</b>	<b>3,974</b>			<b>4,000</b>	<b>4,000</b>
<b>Grand total</b>	<b>1,118,739</b>	<b>17,370</b>	<b>18,654</b>	<b>813</b>	<b>5,429,253</b>	<b>172,862</b>	<b>136,000</b>	<b>2,340</b>	<b>704,160</b>	<b>24,314</b>

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Table showing, by counties, species, and apparatus of capture, the yield of the shore fisheries of California in 1899—Continued.

Apparatus and species.	Sacramento.		San Diego.		San Francisco.		San Joaquin.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
<b>Gill nets:</b>								
Barracuda			47,546	\$1,426				
Herring			15,000	450	1,524,000	\$15,240		
Salmon, chinook	405,733	\$15,946					63,975	\$2,559
Sardines			20,000	600	1,124,000	5,620		
Sea bass					75,000	1,500		
Shad	1,226	24					178,825	3,577
Smelt			19,000	570	716,000	35,800		
Striped bass	113	6					12,750	637
Sturgeon	8,880	4,655					1,335	67
Total	416,952	16,431	101,546	3,046	3,439,000	58,160	256,885	6,840
<b>Seines:</b>								
Carp							20,425	204
Cat-fish	54,861	1,698					20,500	718
Croakers			5,000	150				
Flounders			6,000	180	172,800	2,592		
Hardhead							9,830	345
Herring			5,000	150				
King-fish			1,000	30				
Perch			13,428	403	40,125	1,605	4,300	172
Pike								
Sardines					204,000	1,020		
Shad					45,000	450		
Smelt			14,000	420				
Striped bass					230,400	13,824		
Sturgeon					8,130	480		
Surf-fish			21,000	630				
Total	54,861	1,698	65,428	1,963	700,455	19,971	55,055	1,439
<b>Trammel nets:</b>								
Carp					174,000	1,305		
Croakers			15,000	450				
Flounders			62,977	1,889	1,044,000	15,660		
King-fish			6,000	180				
Mullet			12,000	360				
Perch			4,953	149				
Rock-fish			13,579	407				
Salmon, chinook					55,680	2,227		
Sea bass			19,000	570				
Shad					574,496	5,745		
Striped bass					305,800	18,408		
Sturgeon					55,680	2,940		
Crabs					334,080	7,795		
Total			133,509	4,005	2,544,736	64,080		
<b>Lines, trawland hand:</b>								
Albacore or tunny, salted			48,750	1,950				
Barracuda, fresh			107,208	3,216				
Barracuda, salted			150,000	6,000				
Bonito, fresh			7,500	225				
Bonito, salted			51,750	2,070				
Carp	550	5						
Cat-fish	42,612	1,024					4,570	183
Cultus-cod					15,000	600		
Flounders			56,820	1,705	1,200	60		
Jew-fish, fresh			14,000	420				
Jew-fish, salted			22,500	900				
Mackerel, fresh			13,200	396				
Mackerel, salted			10,500	420				
Pike	122	5						
Rock-fish, fresh			122,218	3,667	35,000	1,400		
Rock-fish, salted			15,000	600				
White-fish			5,200	156				
Yellow-tail, salted			85,500	3,420				
Total	43,284	1,034	710,146	25,145	51,200	2,060	4,570	183
<b>Fyke nets:</b>								
Carp	5,789	58					40,850	409
Cat-fish	77,558	1,963					51,800	1,820
Hardhead	10,967	581					23,570	824
Perch	1,064	173						
Pike	783	30					7,500	300
Split-tail	5,826	117						
Total	107,927	2,922					123,720	8,358
<b>Paranzella nets:</b>								
Flounders					48,000	720		
King-fish					60,000	3,000		
Tomcod					60,000	2,000		
Total					168,000	5,720		

Table showing, by counties, species, and apparatus of capture, the yield of the shore fisheries of California in 1899—Continued.

Apparatus and species.	Sacramento.		San Diego.		San Francisco.		San Joaquin.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Hoop nets:								
Crabs					3,330,600	\$77,714		
Pots:								
Spiny lobsters			61,000	\$1,680				
Shrimp nets:								
Shrimp, dried					177,187	17,719		
Shrimp shells					620,156	1,240		
Total					797,343	18,959		
Tongs, rakes, forks, etc.:								
Oysters, eastern					25,200,000	792,000		
Oysters, native					3,600,000	75,000		
Total					28,800,000	867,000		
Miscellaneous apparatus:								
Abalone, dried			140,981	7,049				
Abalone shells			315,340	6,307				
Terrapin							26,460	\$2,520
Total			456,321	13,356			26,460	2,520
Grand total	622,024	\$22,085	1,527,950	49,195	39,821,334	1,103,664	466,690	14,335

Apparatus and species.	Solano.		Sonoma.		Stanislaus.		Ventura.		Yolo.	
	Lbs.	Value.	Lbs.	Val.	Lbs.	Val.	Lbs.	Val.	Lbs.	Val.
Gill nets:										
Flounders							21,000	\$630		
Rock-fish							8,000	240		
Salmon, chinook	2,834,878	\$100,631							278,800	\$11,188
Shad	3,060	21								
Striped bass	108,310	5,490								
Sturgeon	61,080	3,054							2,040	102
Total	3,007,328	109,196					29,000	870	280,840	11,290
Seines:										
Carp									15,600	155
Cat-fish									45,950	1,149
Hardhead									22,050	772
Perch									1,680	302
Pike									800	32
Smelt							6,000	180		
Split-tail									46,000	920
Surf-fish							8,000	240		
Total							14,000	420	131,980	3,330
Trammel nets:										
Flounders	6,000	180								
Shad	15,000	250								
Sturgeon	10,000	500								
Total	31,000	930								
Lines, trawl and hand:										
Carp									2,000	20
Cat-fish	8,910	356							10,200	255
Pike									1,300	52
Total	8,910	356							13,500	327
Fyke nets:										
Carp									24,400	244
Cat-fish									137,850	3,346
Hardhead	23,250	814							64,475	2,256
Perch									840	42
Pike									1,200	48
Split-tail									80,100	1,602
Total	23,250	814							308,865	7,588
Pots:										
Spiny lobsters							15,000	450		
Tongs, rakes, forks, etc.:										
Clams							16,000	160		
Miscellaneous apparatus:										
Terrapin	10,080	960	13,650	\$1,300	39,900	\$3,800				
Grand total	3,080,568	112,256	13,650	1,300	39,900	3,800	74,000	1,900	735,185	22,485

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Summary, by apparatus and species, of the shore fisheries of California in 1899.

Apparatus and species.	Lbs.	Value.	Apparatus and species.	Lbs.	Value.
<b>Gill nets:</b>			<b>Trammel nets—continued.</b>		
Albacore or tunny	7,611	\$276	Yellow-tail	37,520	\$763
Anchovies	6,826	177	Crabs	334,080	7,795
Barracuda, fresh	710,031	16,588	Total	4,166,156	92,466
Barracuda, salted	29,000	1,280	<b>Lines, trawl and hand:</b>		
Flounders, fresh	219,539	6,244	Albacore or tunny, fresh	21,591	751
Flounders, salted	20,090	1,104	Albacore or tunny, salted	48,750	1,950
Herring, fresh	1,584,000	16,265	Barracuda, fresh	247,889	6,632
Herring, salted	7,539	226	Barracuda, salted	155,085	6,203
Jew-fish, salted	1,500	23	Honito, fresh	29,737	668
Kingfish	42,458	941	Honito, salted	51,750	2,070
Mackerel	36,776	1,384	Carp	2,550	25
Perch, fresh	51,054	1,062	Cat-fish	66,292	1,818
Perch, salted	3,000	120	Cultus-cod	25,000	840
Pompano	7,495	2,897	Flounders	306,160	8,417
Rock-fish, fresh	163,735	4,806	Jew-fish, fresh	19,500	503
Rock-fish, salted	10,000	400	Jew-fish, salted	22,500	900
Salmon, chinook	6,653,879	236,551	Mackerel, fresh	97,715	4,342
Salmon, silver	48,160	1,685	Mackerel, salted	10,500	420
Salmon, blueback	19,100	668	Perch	2,575	52
Salmon, steelhead	113,600	3,876	Pike	1,422	57
Sardines	1,109,000	6,470	Rock-fish, fresh	891,693	27,812
Sea trout	2,358	86	Rock-fish, salted	89,830	1,631
Sea bass, fresh	613,061	13,429	Salmon, chinook, fresh	313,826	14,918
Sea bass, salted	14,000	540	Salmon, chinook, salted	3,000	210
Shad	402,105	5,834	Sea bass	7,873	325
Smelt	1,136,293	51,741	Sea trout	24,700	741
Striped bass	696,320	29,542	White-fish	11,800	304
Sturgeon	129,849	7,476	Yellow-tail, fresh	27,613	518
Surf-fish	12,000	180	Yellow-tail, salted	100,600	4,024
White-fish	35,000	700	Total	2,529,451	86,131
Yellow-tail	10,411	232	<b>Fyke nets:</b>		
Total	13,955,799	412,803	Carp	71,039	711
<b>Seines:</b>			Cat-fish	267,208	7,129
Carp	35,925	359	Hardhead	128,262	4,475
Cat-fish	121,311	3,565	Perch	1,844	215
Croakers	17,919	473	Pike	9,483	378
Flounders	264,306	4,648	Split-tail	85,926	1,719
Hardhead	31,880	1,117	Total	563,762	14,627
Herring, fresh	36,478	902	<b>Paranzella nets:</b>		
Herring, salted	9,000	290	Flounders	48,000	720
King-fish	6,240	135	King-fish	60,000	3,000
Mullet	10,000	250	Tomcod	50,000	2,000
Perch	223,745	6,007	Total	158,000	5,720
Pike	5,100	204	<b>Hoop nets:</b>		
Pompano	5,640	1,560	Cat-fish	11,100	222
Salmon, chinook	61,500	1,553	Hardhead	25,740	257
Salmon, silver	12,000	420	Crabs	3,330,600	77,714
Salmon, blueback	2,500	87	Total	3,367,440	78,193
Sardines	214,000	1,320	<b>Pots:</b>		
Shad	45,000	450	Spiny lobsters	606,713	14,198
Smelt	178,956	6,823	<b>Shrimp nets:</b>		
Split-tail	46,000	920	Shrimp in shells	903,375	36,135
Squid, dried	622,740	18,682	Shrimp, dried	698,625	69,862
Striped bass	230,400	13,824	Shrimp shells	2,445,186	4,889
Sturgeon	10,190	510	Total	4,647,186	110,886
Surf-fish	104,290	2,396	<b>Tongs, rakes, forks, etc.:</b>		
White-fish	1,500	30	Oysters, eastern	25,200,000	792,000
Crabs	12,000	275	Oysters, native	3,600,000	75,000
Total	2,308,560	66,300	Scallops	3,939	738
<b>Trammel nets:</b>			Clams, hard	636,534	9,087
Albacore or tunny	20,000	300	Clams, soft	1,534,400	21,958
Bonito	21,000	465	Mussels	364,076	3,637
Carp	174,000	1,305	Total	31,338,949	902,420
Croakers	23,000	650	<b>Miscellaneous apparatus:</b>		
Cultus-cod	5,000	100	Abalone, dried	369,411	22,813
Flounders	2,002,755	38,685	Abalone, shells	525,453	9,743
Jew-fish	15,000	225	Algae	85,824	896
King-fish	10,000	280	Frogs	20,687	20,688
Mackerel	5,176	129	Sea-lion pelts	13,000	612
Mullet	12,000	360	Sea-lion oil	5,250	210
Perch	150,267	3,321	Sea-lion trimmings		315
Rock-fish	110,637	3,099	Terrapin	107,869	10,376
Salmon, chinook	55,680	2,227	Whale oil	35,790	1,193
Sculpin	3,000	75	Other products	96,276	2,755
Sea bass	41,320	960	Total	1,209,560	69,551
Sea trout	23,000	632	<b>Grand total</b>	<b>64,261,576</b>	<b>1,853,295</b>
Shad	690,696	8,019			
Sole	32,245	645			
Striped bass	807,600	18,448			
Sturgeon	65,880	3,440			
White-fish	2,500	63			
Yellow-fin	24,000	480			

*San Francisco.*—This city is the headquarters of the fishery industries of the State, especially with respect to salmon, salt cod, oysters, shrimp, whale products, and fresh fish. Several millions of dollars of California capital which do not appear in this report are invested in the extensive salmon fisheries of Alaska. Within the past four years the salt codfish business has more than doubled, its products in 1895 being 2,783,550 pounds, of \$83,506 value, and in 1899, 5,917,131 pounds, of \$178,054 value. The cod catch is all from Alaskan waters, the fish being dressed and salted on the vessels or at shore stations near the fishing-grounds, after which they are brought to the home stations at San Francisco and placed under pickle in large vats. As the fish are needed they are taken from pickle, washed, and sun-dried on flakes, or, in unfavorable weather, dried under cover in improved hot-air drying plants. After curing they are prepared for shipment, either as whole fish with the skin on or as boneless fish with skin and bones removed. The codfish business of the Pacific coast has been of slow growth, on account of competition from the Atlantic coast and because the west-coast people have never been much accustomed to the use of salt fish. The domestic demand has increased yearly, and there is a growing trade with the Hawaiian and other islands of the Pacific.

The fresh-fish markets of San Francisco exhibit few changes. The large business here is a combination of retail and wholesale, but principally retail.

The crab fishery of San Francisco has long been of considerable importance. For years the catch was made inside of the Golden Gate, small sail or row boats being used. As crabs became scarce in the bay, the fishing was extended to outside waters. Within the past four years small gasoline boats of 5 horsepower have largely taken the place of sailboats. During 1899, 49 sailboats and 33 gasoline boats were used in the crab fisheries. The gasoline boats, with 2 men, fish 20 to 30 nets each; the sailboats average 15 nets, with 1 or 2 men. With favorable weather the crab fishery is followed all through the year. Day after day the same grounds are worked on. The grounds extend from the mouth of the harbor along the north shore about 10 miles, and the same distance along the beaches on the south. The catch is now nearly all made outside the harbor, where crabs are still plentiful and of larger size than those found in the bay. The average weight of crabs is 30 pounds to the dozen. Prices fluctuate between 40 cents and \$1.25 a dozen, the average being 70 cents.

Since the introduction of gasoline boats the catch of crabs has largely increased, that of San Francisco County in 1899 being 3,664,680 pounds, valued at \$85,509, as against 2,565,000 pounds in 1895, valued at \$61,750, an increase of 1,099,680 pounds. Nine-tenths of the crab catch is made with hoop nets, the remainder being taken in trammel nets.

The only planted oyster beds of California are in San Francisco Bay. The leading features of the trade since the last report, in 1895, have

been a marked reduction in prices and a largely increased demand. The revival in business generally has been very beneficial to the oyster trade. Seed oysters from the Atlantic coast are planted over several hundred acres of the southern part of San Francisco Bay, adjoining the counties of San Mateo, Santa Clara, and Alameda, and here grow to good size and with fine flavor. During 1899, 87 carloads of Eastern seed oysters, of 90 to 100 barrels per carload, were planted on these beds. Of small native oysters, 30,000 bushels were received from the State of Washington, in sacks holding 90 pounds each, or about 1½ bushels. The supply is kept up by importations from Washington, which are planted in the bay until needed and then taken up and packed in small sacks holding one-half bushel each.

Eastern shell oysters are sold by the count—"standards" at \$1.20, and large at \$1.80, per 100. They are generally delivered in boxes holding 250 of the former and 200 of the latter, or about 1½ bushels each. Considerable business is also made of opened oysters, which are placed in tin cans, with ice between the rows of cans, and shipped to far and near places in the interior. In 1899, to supply the demand, 360,000 bushels of Eastern oysters and 30,000 bushels of native oysters were used, their value as placed on the market being \$867,000.

*Fresh fish, oyster, clam, shrimp, crab, and lobster business of San Francisco in 1899.*

Species.	Lbs.	Value.	Species.	Lbs.	Value.
Albacore .....	16,560	\$414	Smelt .....	716,000	\$28,640
Barracuda.....	164,629	4,939	Striped bass.....	1,076,546	53,827
Benito.....	8,169	490	Sole .....	110,872	2,772
Carp.....	174,000	1,305	Sturgeon.....	189,758	8,539
Cat-fish.....	28,138	1,218	Suckers.....	53,462	267
Cultus-cod.....	132,890	3,322	Squid.....	15,580	234
Flounders.....	3,090,255	61,805	Tomcod.....	375,538	11,266
Hake.....	7,210	144	Trout (brook).....	27,029	6,757
Halibut.....	695,062	17,276	Trout (lake).....	38,374	4,605
Herring.....	1,624,000	22,860	Other fish.....	19,249	569
King-fish.....	68,500	1,712	Clams.....	1,765,935	28,916
Mackerel.....	60,964	1,524	Crabs.....	3,664,680	85,509
Mullet.....	2,856	192	Oysters (Eastern)*.....	25,200,000	792,000
Perch.....	147,294	5,894	Oysters (native)†.....	3,600,000	75,000
Pike.....	10,906	218	Sply lobsters.....	187,695	5,630
Pompano.....	5,032	1,761	Caviar.....	6,768	1,015
Rock-fish.....	770,480	23,114	Octopus.....	7,474	149
Salmon.....	3,113,261	124,530	Mussels.....	314,400	3,440
Sardines.....	1,328,000	13,280	Terrapin.....	105,987	10,094
Sea bass.....	335,991	8,300	Frogs.....	20,258	20,258
Shad.....	679,177	13,584			
Skates.....	13,571	203			
			Total.....	49,902,550	1,447,672

\* 360,000 bushels.

† 60,000 bushels.

The following table shows the amount and value of the latest introduced fish received at San Francisco:

Species.	1899.		1900.	
	Lbs.	Value.	Lbs.	Value.
Striped bass.....	1,076,546	\$53,827	1,251,202	\$62,550
Shad.....	679,177	13,584	620,891	13,970
Carp.....	174,000	1,305	133,469	1,335
Cat-fish.....	28,138	1,218	24,378	1,036
Total.....	1,957,861	69,934	2,029,940	78,901



The whale fishery continues to show a decrease in the number of vessels engaged. The business of 1899 was the most satisfactory for several years, having fewer disasters and larger returns. With ten less vessels engaged than in 1895, the receipts of 1899, when compared with that year, show a gain of 96,206 pounds of whalebone, 26,540 gallons of sperm oil, and 5,263 gallons of whale oil, the gain in the value of products taken in 1899 over those of 1895 being \$108,482.

The fleet of 1899 comprised ten steamers and six sailing vessels belonging in San Francisco, and one steamer and five sailing vessels of New Bedford with headquarters in the former city. The San Francisco vessels captured 101 bowhead, 7 right, and 6 sperm whales; the New Bedford vessels took 14 bowhead, 10 right, and 103 sperm whales.

Some of the vessels were quite fortunate, the steamer *Beluga* leading, with 32 bowhead whales, that yielded 53,000 pounds of whalebone; the steamer *Jeannette* being next, with 18 bowhead whales and 33,400 pounds of whalebone. Others were less fortunate, some having very little bone or oil.

The following table shows the decrease in the number of vessels during recent years:

Home port.	1892.	1895.	1899.
San Francisco.....	36	22	16
New Bedford.....	21	10	6
Total.....	57	32	22

The statistics of the whale fleet having headquarters at San Francisco in 1899 are as follows:

Home port.	No.	Tonnage.	Value.	Value of outfit.	Advances to crew.	No. of crew.
San Francisco.....	16	4,416	\$575,000	\$374,000	\$57,560	638
New Bedford.....	6	1,951	89,000	85,000	20,900	247
Total.....	22	6,367	664,000	459,000	78,460	885

Home port.	Products.									
	Whalebone.		Sperm oil.		Whale oil.		Trade bone.		Trade furs.	Total value of products.
	Lbs.	Value.	Galls.	Value.	Galls.	Value.	Lbs.	Value.	Value.	
San Francisco.....	201,225	\$425,550	9,633	\$3,625	53,235	\$15,373	6,167	\$10,722	\$3,422	\$458,692
New Bedford.....	36,500	69,875	84,892	32,189	53,077	15,923	.....	.....	.....	117,987
Total.....	237,725	495,425	94,525	35,814	106,312	31,296	6,167	10,722	3,422	576,679

*Del Norte County.*—The fisheries of this county are not of much importance except to the ranchers and Indians living near Smith or Klamath rivers. Smith River enters the Pacific near the Oregon border line. A cannery here has been idle for several years. During 1899 there was only a light run of salmon in Smith River; the catch was salted and amounted to 24,000 pounds. The single cannery near the mouth of Klamath River packed 1,600 cases of salmon, using

112,000 pounds of fish, which represented the catch of the Klamath, except that taken by ranchers and Klamath Indians for their own use.

*Humboldt County.*—For several years the fisheries of this county have declined both in the number of fishermen, fishing apparatus, and products. In 1895 the fishermen numbered 376, in 1899 only 185; the products those years being as follows:

Species.	1895.		1899.	
	Lbs.	Value.	Lbs.	Value.
Salmon, chinook .....	277,325	\$8,320	176,100	\$5,189
Salmon, silver .....	136,413	4,092	60,160	2,105
Salmon, blueback .....			21,600	756
Salmon, steelhead .....	409,237	16,370	113,600	3,876
Flounders .....	57,000	1,030	75,200	1,504
Smelt .....	30,000	600	81,000	2,430
Rock-fish .....	35,000	525	20,000	600
Herring .....	20,000	100	39,000	990
Perch .....	20,000	300	25,000	490
Other fishery products .....	162,400	2,124	91,500	6,375
Total .....	1,147,375	33,461	704,160	24,314

The salmon fisheries are of chief importance, their decrease, as above shown, being 451,515 pounds. The fishermen attribute the decrease largely to a close season in 1899, from February 1 to May 1, on steelhead, and from September 11 to October 15 on salmon. In 1899 the steelhead catch was all made in January; the salmon catch in October, November, and December.

The fisheries of the county are chiefly on the lower end of Eel River, with some on Elk and Mad rivers and in Humboldt Bay. For several years a cannery and saltery on Eel River canned a large amount and salted several thousand barrels of salmon yearly. During the past few years no salmon have been canned or salted; after supplying the local demand the surplus is sent to fresh-fish firms in San Francisco.

The continued decrease in the salmon fisheries of Eel River has been offset to some extent by close-season laws and artificial propagation. These agencies have proved beneficial, and fish were more plentiful in 1900 than at any time since 1895. The fishermen receive \$40 per month and their board, their catch in the rivers being made with haul seines and gill nets. A small amount of fishing in the bay supplies the local demand with halibut, smelt, herring, perch, rock-fish, cultus-cod, clams, and crabs.

*Marin County.*—The fisheries of this county are represented by the cod-drying stations at Pescada Landing and California City, Chinese shrimp camps at San Quentin and Point Pedro, and general fisheries in Tomales Bay. The total fishery products amounted to 2,323,060 pounds of \$64,495 value. Over half of this amount was shrimps taken by Chinese. The Tomales Bay fisheries are noted for the yield of clams at all seasons, and for herring, smelt, sardines, and sea bass in their seasons. The fishermen send their products to the San Francisco market. During 1899 fish were very plentiful in both Tomales

and San Francisco bays; prices dropped so low that little was left the shipper after charges were paid, the market being amply supplied direct from San Francisco vessels and boats at the wharf; shipments from points dependent on the railroads largely decreased, those from Marin County falling to about one-half those of 1895.

*Santa Cruz County.*—The fisheries of this county are carried on from Santa Cruz and Capitola, the catch being made in Monterey Bay. As compared with 1895 there are few changes of note. The products show some falling off in quantity, caused by a smaller number of fishermen being engaged. The principal item of decrease was 134,325 pounds in the catch of sea bass.

Localities occupied long by fishermen have of late years become more valuable, and high rents have compelled them to look elsewhere, but their places are largely filled by tourists and sportsmen who find great sport in trolling for salmon during June, July, and August; at times 60 boats were thus engaged, the salmon catch by hook and line being 85,340 pounds. The salmon taken were all chinook, which refuse the hook or food after entering fresh-water streams. Monterey Bay appears to be the southern limit of migration for the salmon and shad. Seldom is a single specimen of either seen south of this bay, and at no other place on the Pacific coast do professional fishermen use hooks and lines in the salmon fisheries.

An increased demand with enhanced prices has fully made up in values the losses from a decreased catch. A large local demand is supplied with a good variety of the best food-fishes found on the coast; any surplus is forwarded by express to San Francisco.

*Monterey County.*—The fisheries of Monterey County embrace a large number of species of fine food-fish, also abalones, clams, mussels, squid, shark-fins from the sea, and frogs from the shore; to these are added whales, sea lions, starfish, sea-urchins, and algae.

The products of 1895 amounted to 1,109,786 pounds of \$20,406 value. As compared with these figures the product of 1899 show a gain of over 100 per cent in weight and 400 per cent in value as follows:

Items.	Pounds.	Value.
Fresh fish .....	1,346,783	\$45,792
Dry and pickled fish .....	209,199	10,224
Miscellaneous products .....	899,830	24,805
Total .....	2,455,812	80,821

Of the fresh fish products 441,180 pounds were peddled through the interior, and 905,583 pounds expressed to the San Francisco market. The dry and pickled fish, 100,824 pounds, with 622,740 pounds of dry squid, had a distribution extending to Honolulu, Japan, and China.

The Japanese follow the abalone fishery, in which divers with diving

suit, air pumps, and accessories are used off the rocky shores of Monterey Bay, the products amounting to 108,375 pounds of dry abalone meat and 63,293 pounds of abalone shells. Abalone meat, dried, is sold to the Chinese of the United States and China; the shells are sold to tourists, to button and fancy-work factories, and to some extent in Europe.

The Chinese have for many years been the exclusive fishermen for squid, which are taken in small-sized purse seines used just abreast of their camp. This catch, dried and ready for shipment amounted to 622,740 pounds of \$18,682 value.

The whale fishery was followed by 8 Portuguese and 8 Japanese, who use whale boats to pursue passing whales, which on being killed are towed to shore stations and there cut up and the oil extracted.

Of late years quite a business has sprung up in the capture of sea lions alive, which are sold for exhibition purposes and to zoological parks of this country and Europe. Thirty-seven sea lions were taken by the fishermen of Monterey County and so disposed of in 1899.

The frugal Chinese and Japanese seldom reject any food products from the sea, as will be noticed in the saving of 9,065 pounds of starfish and sea urchins, 35,824 pounds of algæ, and 74,421 pounds of bones of whales. The first two are cleaned and prepared for sale to tourists and collectors of sea products. Algæ are dried and used by the Chinese for many purposes, including food, medicine, and fertilizing. The bones of whales killed near Monterey and those found on the beaches along the coast are shipped to San Francisco and there ground up for fertilizing purposes.

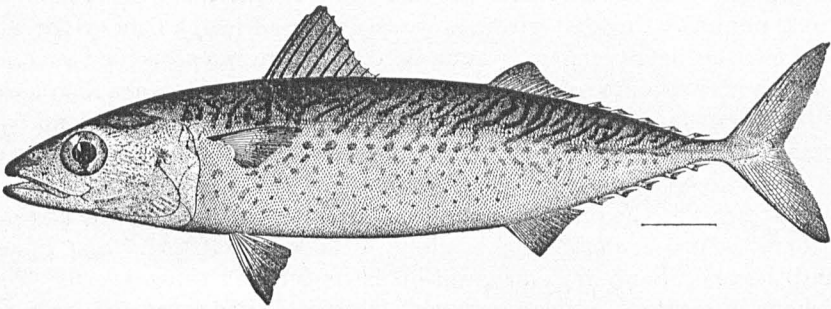
The salmon fishery is of comparatively late date. The fishermen were led into it from seeing the success of sportsmen trolling with spoon hooks. In 1892 they secured in this way 6,915 pounds; in 1895, 94,475 pounds, and in 1899 the catch by hooks and lines amounted to 227,486 pounds. These salmon are all chinook and are taken only in May, June, July, and August. The catch is sold locally.

*San Luis Obispo County.*—The fisheries of this county present no changes of note in the kinds or quantity of products handled. A few fishermen at Port Harford supply the surrounding country with fresh fish; the surplus is sent to San Francisco. The aggregate products of 1899 amounted to 252,255 pounds of fresh fish, 30,810 pounds of salt fish, and 58,265 pounds of other fishery product, the total value being \$12,713; 175 sea lions were shot for their oil and hides.

*Santa Barbara County.*—Nearly every fishing station between San Francisco and San Diego shows quite large gains in the fisheries, Santa Barbara being an exception. Fish are plentiful in Santa Barbara channel and around the islands, yet the local demand for fish is only poorly supplied. The few fishermen work with little energy and only part of the time. The products of the fisheries in 1899 amounted to 655,893 pounds of \$15,597 value. This includes 168,746 pounds

of fresh fish, sold locally; 332,427 pounds of spiny lobsters, most of which were shipped to San Francisco; 56,125 pounds of abalone meat, and 96,635 pounds of abalone shells. These amounts have varied but little from year to year during the past ten years.

Sea lions are numerous around the several islands of Santa Barbara County, but they have very little commercial value. Each season a number of them are captured alive by lassoing them as they leave the rocks for the water. The capture of sea lions from small open boats is exciting and dangerous. The animals make a hard fight for freedom, but after being severely choked they are dragged ashore and placed in strong boxes for shipment. The demand for sea lions is small, and prices have declined from \$50 each to as low, in some cases, as \$10. Of those captured in 1899, five weighing 1,180 pounds were sent by express to the Atlantic coast. Seven yearlings of 780 pounds aggregate weight were shipped to Pacific Grove, Monterey County, to be tamed for exhibition purposes.



BULL-EYE OR CHUB MACKEREL (*Scomber colias*).

*Los Angeles County.*—The several reports on the Pacific coast fisheries by the U. S. Fish Commission since 1889 have called attention to the opportunities for a large increase in the fisheries of this section, and an increase is now shown by the following account of the aggregate yield of fishery products: 910,531 pounds in 1889; 1,155,168 pounds in 1892; 2,905,988 pounds in 1895; 3,960,062 pounds in 1899.

The fisheries are carried on from small boats used near the several fishing stations of the county. The products are mostly shipped by express to Los Angeles, a small amount being used for the home demand. The weights as shown are largely from the books of the railroad and express companies.

The several fish stations of the county, and the amount of the fishery products of each in 1899, were as follows: San Pedro, 2,690,000 pounds; Redondo, 630,890; Santa Monica, 144,666; Wilmington, 120,939; Long Beach, 136,333; Clementus, 137,234; minor stations, 100,000; a total of 3,960,062 pounds. The value to the fishermen amounted to \$82,371, the increase over the business of 1895 being 1,054,074 pounds, worth \$27,506.

The capital invested in the fisheries amounted to \$113,356, with 198 fishermen and 100 shoresmen employed. Sardines comprise about one-fourth of the products. This is the only branch of the fisheries in which vessels are used. The catch is made with purse seines. Since the introduction of California sardines their superior quality has caused a steadily improved demand. During 1899 the pack of the cannery at San Pedro amounted to 13,000 cases, of which 5,000 cases were one-quarter and 3,000 cases one-half flat, packed in olive oil, spices, and mustard; the remainder, 4,500 cases in one-pound tall and 500 cases in two-pound tall cans, were labeled mackerel. Nearly all of the sardine catch is canned.

With the exception of sardines used in canning, the products of the fisheries were disposed of fresh. Bastard halibut (*Paralichthys californicus*) which are included with flounders in the accompanying statistics for California, furnished 1,080,463 pounds, or about one-third of the quantity sold fresh. The demand for this fish always exceeds the supply. It is sold under the name of halibut, and weighs from 10 to 30 pounds. In 1899 gill nets were first used in the fishery for this species, the nets being set on the bottom. Proving a decided success, they soon came into general use. Trawls and hand lines are also used, but gill nets are preferred for bastard halibut, on account of no bait being required. In this fishery the catch by gill nets was fully as large as that taken previously by trawls.

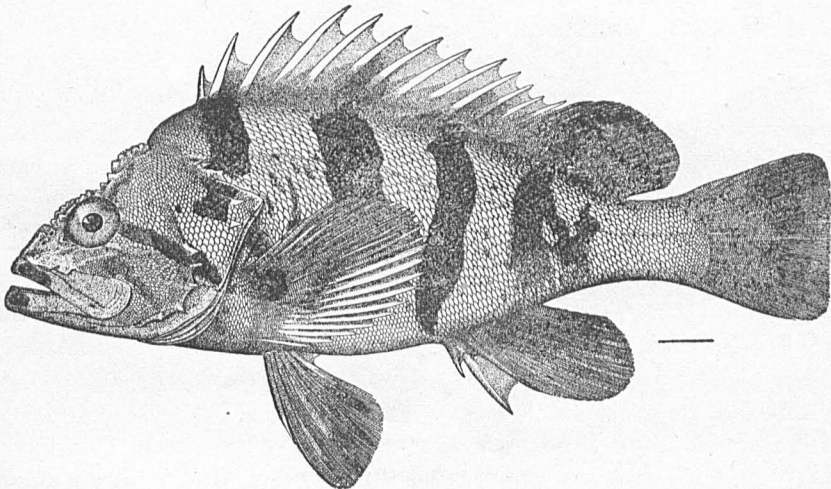
California is the only part of the United States in which the abalone fishery is prosecuted. The abalone is taken exclusively by Chinese and Japanese, and its consumption is mainly by those races. This fishery is located 4 miles northwest from San Pedro, at the extreme southern end of Los Angeles County. The camp has an American superintendent, with 20 Japanese, 9 of whom comprise the fishery party, the others working on shore. At this point the shore is rough and rocky, the abalones being found attached to the rocks, from which they have to be removed by the use of a stout chisel. The products in 1899 amounted to 60,000 pounds of dried abalone and 30,000 pounds of shells, of \$7,800 value.

This catch was made by divers without armor in from 20 to 25 feet of water. The apparatus used is simple and inexpensive; a small keg is anchored over the abalone bed; to this a netted bag is attached to receive the catch, the buoy simply being used by the divers to support them for a very brief rest between dives, at which time any abalones brought up are placed in the netted bag. The taking of abalones by diving is of a comparatively late date. The abalone fishery is the only one in the United States in which diving armor is used.

A head diver is paid from \$75 to \$100 per month; an assistant who acts as diver when necessary, from \$60 to \$75 per month; head curer, \$50 per month; all others, \$20 per month. In addition to these wages the men receive their board and lodging at the camp. The diving

armor with air pump came into use in 1900. Divers in armor work throughout the year in from 20 to 75 feet of water, when the weather is favorable. The diver takes down with him a netted bag into which he puts the abalones as he pries them from their rocky attachment. When the bag is filled it is hauled up on signal, emptied into the anchored boat, and returned to the diver. Divers work a full day, remaining below as long as two hours at a time.

As soon as the abalones are received at camp they are taken from their single shell and all refuse matter removed. The meat or solid portion is then prepared for market as follows: After washing, it is placed in a weak salt pickle overnight. In the morning it is removed, washed, and boiled for a few moments, then placed on trays, each tray holding an average of 100 abalones. These are exposed to the sun and air for half a day and are then placed in a smokehouse for three hours,



BLACK-BANDED ROCK FISH (*Sebastichthys nigrocinctus*).

charcoal being used in the smoking. They are next given a second boiling for half an hour, when they are again placed on trays and exposed for two to three weeks in drying. Finally they are placed in lukewarm water for two to three hours and then given two weeks' drying, which leaves them very hard and solid. The meat is cleaned and packed in cases lined with parchment paper to exclude moisture, the cases holding 200 pounds each. Only the best shells are saved.

As the abalone comes from the water the shell and soft parts are of about equal weight, one-half of the latter being waste. As finally cured, only 10 pounds of meat is produced from 100 pounds of shells and meat fresh, a shrinkage of about 90 per cent.

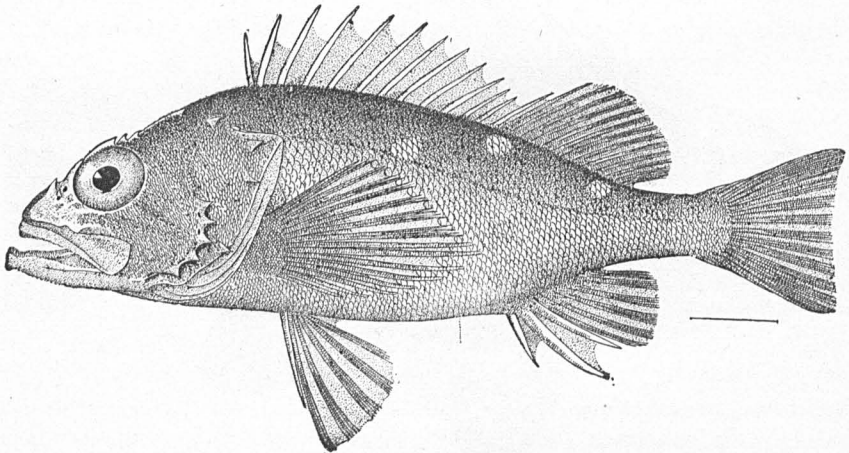
In San Diego County the preparation of abalone meat here consists simply in boiling the abalones once for two to three hours in sea water. After the one boiling they are sun-cured for several weeks

and then packed in bags and shipped to San Diego; at the latter port commission firms forward them to San Francisco and direct to China.

The Mexican mode of preparation of abalone meat is still more simple. The meat, after being cleaned of all offal and washed, receives three cuts which lay it open but do not detach the several parts. It is next spread out for drying without any salt or other preparation. This meat, after drying, is very white, as when first taken from the shell. At other places where abalones are salted and smoked they take on a more or less dark color.

While drying, abalones are repeatedly turned until cured hard.

The clams and spiny lobsters of Los Angeles County are much in demand, and several attempts have been made to can them. On page 646 of the report of this Commission for 1896 an account is given of the canning of the *Donax californicus*, a very small clam, some three-



CORSAIR (*Sebastichthys rosaceus*).

fourths of an inch long. These clams were very abundant on the shores of Long Beach, but the supply was soon exhausted. During 1899 another firm for a short time canned the large-sized hard-shell clams obtained on the beach, being found quite deep in the sand, from which they were taken at low tide. The supply was so limited that the cannery was discontinued after packing a few hundred cases. The cannery paid 60 cents per 100 pounds for clams in the shell. From 175 pounds 12 gallons of nectar and 2½ gallons of clam meat were produced. The nectar was packed in pound cans; the refuse was sold as poultry food, being packed in gallon cans. Large and small sized hard-shell clams are more or less plentiful in the several beaches of the county. The near-by ranchers as well as regular fishermen take in the aggregate quite a large amount, that are sent to the dealers of Los Angeles. About 1 ton a week is sent to the city during the year. The clam men receive 1½ cents a pound for small clams, locally known

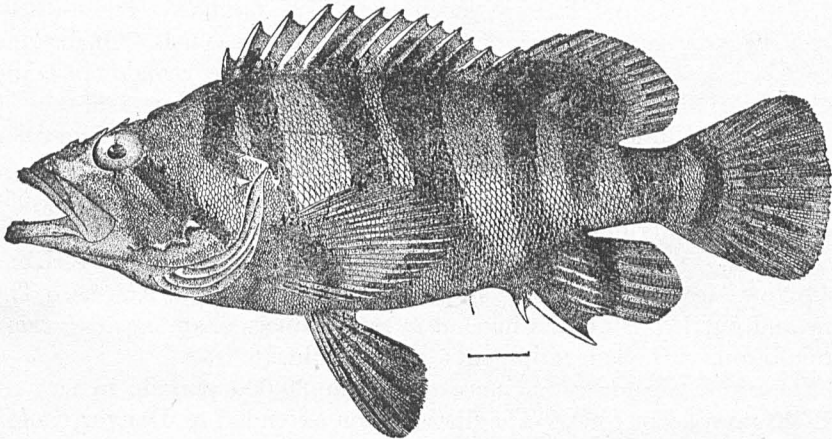


as cockles, and 1 cent a pound for the large size. Clams are teamed from Redondo, Long Beach, Bologna, and other beaches.

The supply of spiny lobsters never fills the demand. Two small canneries were for a time operated at San Pedro in 1899, in which 118,000 pounds of lobsters in the shell were used. A small quantity was canned at Los Angeles during 1899 and 1900, but until the supply is largely increased the canning of spiny lobsters will be limited.

Redondo is one of the important fishing stations of the county, from which the business is carried on in small boats. Trawls and gill nets are used for some 6 miles north and the same distance south from the home station, and 2 to 6 miles from shore. The catch includes bastard halibut, flounders, sea bass, yellow-tail, jew-fish, and barracuda.

Of the several fishing stations of Los Angeles County, San Pedro is the most important. The shipments from that port in 1899 com-



TREE-FISH (*Sebastichthys serriceps*).

prised 1,621,710 pounds of fresh fish, 12,622 cases of sardines, 1,639 cases of lobsters, and 90,000 pounds of abalone meat and shells.

In past years quite an amount of the products were dry and pickle-cured. The fresh-fish demand has supplanted the cured-fish business at this port, the shipments of dry fish being only 1,590 pounds. The following statement of shipments by the Wells-Fargo Express Company is of interest not only in showing the extent of the fresh-fish business, but the recent wide distribution:

Destination.	Lbs.	Destination.	Lbs.
Los Angeles.....	931,635	Oklahoma.....	5,220
Other local points.....	241,665	Missouri.....	4,000
San Francisco.....	251,530	Minnesota.....	60
Arizona.....	64,965	Illinois.....	620
New Mexico.....	18,385	Indian Territory.....	560
Texas.....	32,565	Iowa.....	50
Colorado.....	28,385	Utah.....	320
Kansas.....	33,170		
Nebraska.....	8,580	Total.....	1,621,710

*Orange County.*—The fisheries are represented in this county by 34 fishermen at and near Newport. The aggregate products were 355,417 pounds, the total value being \$8,648. Among the numerous species taken were 89,910 pounds of halibut, 68,607 pounds of rock-fish, and 46,000 pounds of barracuda.

*San Diego County.*—The fisheries of this county show few changes. The total products in 1895 were 1,374,491 pounds, valued at \$27,951, as against 1,655,950 pounds in 1899, valued at \$55,315. The gain of 281,459 pounds and \$27,364 in value was chiefly from an increase in the abalone fishery and enhanced values received for all fishery products. Of the products of 1899, 626,629 pounds were sold as fresh fish and 489,000 pounds as dry and pickled fish. These amounts vary but little from year to year. The fresh-fish values include 17 species, of which barracuda led with 154,754 pounds, followed by rock-fish, 135,797 pounds, and bastard halibut, 125,797 pounds. These three species comprise two-thirds of the total sales of fresh fish. Of dry and pickled fish nearly half consisted of barracuda, the remainder being yellow-tail, albacore, bonito, rock-fish, mackerel, and jew-fish.

The capital in the fisheries amounted to \$32,190, and 175 fishermen and 6 shosmen were employed.

Shipments of fresh fish by Wells-Fargo Express amounted to 371,552 pounds. Of this amount one-half went to local points in southern California, one-fourth to San Francisco, and the remainder to Arizona and New Mexico, with small shipments to Colorado and Kansas. The dry and pickled fish find a market in San Francisco, among its foreign population, with some shipments to Honolulu.

The spiny-lobster catch increased from 30,000 pounds in 1895 to 61,000 pounds in 1899. The distribution extended to Denver, Colo., San Antonio and Dallas, Tex., the City of Mexico, and as far east as Minneapolis, Minn. With an ample supply of spiny lobsters their shipment would be an important feature of the fisheries.

The abalone fishery shows an increase of 385,761 pounds of abalone meat and shells and an increase in value of \$11,795 from that of 1895. This increase has been from three camps of American fishermen at and near Turtle Bay, off the Mexican coast, where they have concessions from the Mexican Government. The abalones were mostly taken by hand picking at low tide, one diving outfit being used by the three camps.

The shells find a market to some extent in France and Germany, where they are made into large buttons and also used by manufacturers of fancy boxes and toilet articles. The large, fine shells find a market in the United States, being polished and sold for ornaments.



BOXING OYSTERS ON THE BEDS IN SAN FRANCISCO BAY.



SORTING OYSTERS FOR MARKET, SAN FRANCISCO BAY.