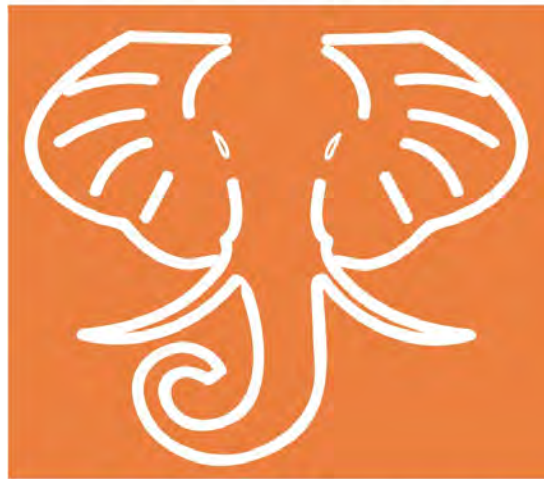


Reports.

Washington (State).
Olympia [etc.]

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STATE OF WASHINGTON
Department of Fisheries and Game
CHARLES R. MAYBURY, Director

Thirty-Sixth and Thirty-Seventh
Annual Reports

OF

State Department of Fisheries
and Game

DIVISION OF FISHERIES

FOR THE

Period From April 1, 1925, to March 31, 1927
Fiscal Years of 1925 and 1926

CHARLES R. POLLOCK
State Supervisor of Fisheries



OLYMPIA
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DEPARTMENT OF FISHERIES AND GAME

DIVISION OF FISHERIES

PERSONNEL AS OF MARCH 31, 1927

State Fisheries Board

Wm. Townsend, ChairmanPt. Townsend
Harry Ramwell, Member.....Everett
P. Blake, Member.....Sequim

Director of Fisheries and Game

R. Maybury.....Olympia

Supervisor of Fisheries

R. Pollock.....Seattle

Hatcheries

Rayhall.....General Superintendent of Hatcheries.....Seattle
S. Elnarsen.....Assistant Superintendent of Hatcheries.....Stanwood
Glenn.....Superintendent Green River Hatchery.....Auburn
Parsons.....Superintendent Kalama Hatchery.....Kalama
Jensen.....Superintendent Samish Hatchery.....Bow
Aldridge.....Superintendent Skykomish Hatchery.....Startup
Rice.....Superintendent Chehalis Hatchery.....Elma
Dedman.....Superintendent Cowlitz River Hatchery.....Lewis
Lytle.....Superintendent Salt Water Feeding Pond.....Brinnon
Jackson.....Superintendent Chinook Hatchery.....Chinook
Sawdey, Jr.....Superintendent Nasel River Hatchery.....Naselle
Cook.....Superintendent Nooksack Hatchery.....Kendall
Deemer.....Superintendent Puyallup River Hatchery.....Orting
Fletcher.....Superintendent Willapa Hatchery.....Lebam
Knapman.....Superintendent Dungeness Hatchery.....Sequim
Lees.....Superintendent Chehalis Hatchery No. 2.....Ceres
Ruthford.....Superintendent Humptulips Hatchery.....Humptulips

Oyster Reserves

Rice.....Superintendent.....Belfair

Patrol

Metson.....Chief Fisheries Inspector.....Shelton
J. Shaw.....Fisheries Inspector.....Seattle
S. B. Wellington.....Inspector and Captain Patrol Boat
"Elisha P. Ferry".....Everett
N. Nelson.....Inspector and Engineer.....Stanwood
Hufford.....Fisheries Inspector.....Stevenson
Mack.....Fisheries Inspector.....Bellevue
Spence.....Fisheries Inspector.....Everett
Lake.....Fisheries Inspector.....Pt. Orchard
McDonough.....Fisheries Inspector.....Cathlamet
Burkeblle.....Fisheries Inspector.....Ocean Park
Lorr.....Fisheries Inspector.....Seattle
Anderson.....Fisheries Inspector.....Vancouver

Office

E. Tanner.....Secretary.....Seattle
R. Snyder.....Assistant Fishery Collector and Inspector.....Seattle



STATE OF WASHINGTON
Department of Fisheries and Game
Division of Fisheries

Thirty-Sixth and Thirty-Seventh
Annual Reports

OF

State Department of Fisheries
and Game

DIVISION OF FISHERIES

FOR THE

Period From April 1, 1925, to March 31, 1927



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Seattle, Washington, April 1, 1927.

To His Excellency,

ROLAND H. HARTLEY, Governor of Washington.

Sir: I have the honor to submit herewith in accordance with law, the Thirty-sixth and Thirty-seventh Annual Reports of the Department of Fisheries and Game, Division of Fisheries, of the State of Washington for the fiscal years ending March 31, 1926, and March 31, 1927, respectively.

Respectfully submitted,

CHARLES R. MAYBURY,

Director of Fisheries and Game.

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THIRTY-SIXTH AND THIRTY-SEVENTH ANNUAL REPORTS

HON. CHARLES R. MAYBURY,
Director of Fisheries and Game,
Olympia, Washington.

In January, 1925, the writer, who had been employed in the Division of Fisheries as Collector for the State Treasurer, was made acting Supervisor, to fill the vacancy left by the sudden death, by accidental drowning, of Ernest A. Seaborg, who had been the Supervisor of Fisheries since January 1, 1922.

The first matter which came under my attention for immediate consideration was to explain to the appropriation committees of the short session of the legislature that year, the budget requirements and to prepare a supplemental budget to cover the needs for one year's work. Although conversant in a general way with the entire work of the department there was not, of course, sufficient time to inspect the entire hatchery and patrol requirements in conformity with the items set out by my predecessor, in his budget for the years 1925 and 1926; however, the appropriation secured was ample to meet the needs in the various segregations of our work. Besides the gradual detaching and planning a program of repairing, rebuilding and extension of the hatchery system and a readjustment of the patrol and inspection service, which will be covered in detail a little farther along in this report, especial studies were made of the available reports of previous administrations bearing on fishing conditions, results of artificial propagation, present and past regulations, recommendations for additional regulations, scientific surveys, etc., to better fortify the department in whatever action it might take or recommendations it might propose, to increase its usefulness to the commercial fishermen who furnish the funds on which the department is operated; and to develop work along the proper lines for the upbuilding of the fish runs, especially salmon, in such a manner that the industry would continue to prosper and its future be more secure.

Probably no one who was ever charged with the executive work of this department, generally speaking, did more to advance the work in artificial propagation of salmon in this state than Mr. Leslie H. Darwin, who was Fish Commissioner from 1913 to 1921, and who in addition to that most important work, introduced modern methods in handling office details, reorganized the entire departmental records of the past, brought these records up to date, and left data, properly segregated and tabulated, that will always be of the utmost value to the fishing industry of the state of Washington. This was accomplished when the funds were limited and the experiences gained provided the changes in legislation in 1921, which furnished and has continued to supply more adequate funds for further enlargements during the past two years.

The needs for stricter regulations and curtailment of excessive over-fishing, which went on during and after the great war, were set out in Mr. Darwin's last two biennial reports and it seems entirely in order to quote briefly from these reports as follows:

WHAT SHOULD BE DONE TO SAVE OUR FISHERY.

(Page 37, Report of March 31, 1919)

No honest person, familiar with the facts, will attempt to deny that the fisheries of the state of Washington are being depleted. In this report I have attempted to show the various causes contributing thereto. What, then, is the remedy?

For six years as Fish Commissioner I have watched the legislative attempts to evolve a remedy. For twelve years before that, as a newspaper representative at Olympia, I saw more or less of the legislative struggles raging around our fishery.

Experience thus gained has forced me to the conclusion the greatest hope lies in the creation of a fishery or conservation commission, patterned after the Public Service Commission, to consist of not less than three persons. This commission can be elective or appointive, but the members should serve for long terms and should only be removed as elective state officers are removed, namely, by impeachment. They should say when, where and how fishing operations shall be conducted. They should have sole authority to prescribe all regulations and to enforce them.

A commission thus constituted and empowered could do that which was necessary at the time it should be done. Every action it would take would result from a personal knowledge of the members of the reason for so doing. In the state of Washington the Public Service Commission has authority to regulate business which must involve an investment of at least \$200,000,000. They fix rates and prescribe regulations for all the railways of the state, electric light companies, gas companies, street car and other public utilities. If three citizens of the state of Washington can be entrusted with this vast responsibility, surely there are three other persons in the state who could be entrusted with the proper conduct and regulation of our fisheries.

We have other precedent for the delegation of a commission with powers similar to this. On our statute books today, there is a law which provides that county game commissions in their respective counties may open, close or shorten the season on upland birds, with the consent of the state game warden. There is no law on our statute books that has worked more satisfactorily than this one. Game conditions of our state have steadily improved under the operation of this statute and the demand now is to extend its scope rather than to restrict it.

Also, it may be pointed out the Federal laws give the U. S. Bureau of Fisheries somewhat similar authority in its control of Alaska fisheries.

In my judgment, it is highly important the members of this commission should be able to discharge their duties with all the freedom of a judge. Under the present system, any attempt to have the legislature pass fishery conservation measures only serves to bring to the state capitol those who oppose the measures through selfish interest. The selfish interests quickly organize and the member of the legislature, busy with the multitudinous affairs which come before him, honest though he be, may have serious doubts raised in his mind as to which is the proper course of action to take.

On the other hand, with such a commission as above outlined, an honest man with an honest cause should have no hesitancy in presenting it to the decision of men who are personally familiar with the subject and who are in position to render honest, unbiased and unprejudiced decisions.

CREATION OF THE FISHERIES BOARD IN LINE WITH THE ABOVE RECOMMENDATIONS.

(Pages 8 and 9, Report of March 31, 1921)

During the war, the demand for salmon was so great and such intensive fishing resulted that a sufficient number were not permitted to escape to the hatchery streams and the natural spawning grounds to anywhere nearly maintain the normal supply.

With a full knowledge of this condition, I prepared a fisheries code, which would have largely curtailed fishing and have regulated fishing operations, to the end that a larger escape of spawning fish would have occurred.

The passage of this code was bitterly opposed in the legislature by a majority of those interested in the taking of the fish. They succeeded in accomplishing its defeat.

In my last biennial report made to you, which was made within a few weeks following the defeat of my proposed code in the legislature, I pointed out to you that my experience led me to the conclusion that it would be impossible to preserve the fisheries of this state through legislative enactment. This for the reason that selfishly interested parties had always theretofore succeeded and would likely thereafter succeed in so confusing the legislature as to prevent the passage of any real conservation measures.

I, therefore, recommended to you the creation by the legislature of a state fish commission, which would be clothed with full authority to say how, when and where fishing operation might be carried on. I pointed out the necessity of the commission being given these broad powers. It was recommended that the commissioners serve for long terms, and be removed only by impeachment, as elective state officers are removed.

The 1921 legislature passed the Civil Administrative Code, which created the State Fisheries Board, clothed with the powers which I suggested. The power for good of a board so constituted, in the hands of honest, capable and impartial men, is almost unlimited. I recognize its equal possibilities for harm in improper hands. Unfortunately, the law does not provide the suggested safeguards as to tenure of office of the members of the board.

SIX YEARS OF FISHERIES BOARD REGULATIONS.

In the report for the biennium ending March 31, 1924, and March 31, 1925, some conclusions were presented, being drawn from four years of fishing under regulations promulgated by the State Fisheries Board. The life of the salmon is generally accepted as being four years, except as concerns the humpback or pink salmon, which completes its life's journey in two, and four years are not, presumably, a fair test for the activities of such a body as the Fisheries Board. Each and every year of their first four years of service brought in the completion of a different salmon cycle and the beginning of a new cycle. The past two years, 1925 and 1926, each completed a four year cycle period following the years 1921 and 1922 respectively. In 1921 the total salmon reported being taken by all classes of gear in all four districts of the state was 7,545,790 fish of all species, while in 1925 the next cycle year, the commercial fishermen reported a total of 10,906,873 fish, an increase of 3,361,083 or 30%.

The total salmon caught in 1922 over the entire state was 2,922,286, while in 1926 the total catch was 3,623,459 salmon of all species, the increase being 701,173 fish or 19.3%.

It must be remembered that in 1921 the industry was still feeling the effects of over-financing, and over-production which caused readjustments or complete failures and some noticeable curtailment of fishing through these causes, but all of the regulations providing reduced fishing areas and shorter seasons, not to overlook increases in size of net meshes, were not in full effect until 1922, thus perhaps 10 to 15% of the increase in 1925 over 1921 might be chargeable to curtailment through adverse business conditions in 1921. The fact remains, however, that the new system of regulation has at least stopped the decline especially noticeable from 1913 to 1919, although it must be borne in mind that the year 1913, especially in the Puget Sound district, showed approximately a 35% excess of fish caught over any peak year before the year 1913 or since.

The conclusions previously mentioned regarding the operations of the Board, are worth repeating, in part at least, because these conclusions to

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some extent form the basis upon which much of the department's expansion program is based.

The first step taken by the Board was to make a comprehensive survey of the whole situation, the result of which survey was to force home the conviction that, notwithstanding the fact that the officials of the Department of Fisheries had been for years expending a large amount of money, time and energy in the effort to build up the salmon runs to something like their oldtime proportions, the decline of the runs had been constant, and had approached the danger point.

An intensive study of the situation resulted in the only possible conclusion, namely, that either artificial propagation was ineffective as then conducted by the state, or, that the magnitude of the operations was inadequate to meet the drain upon the annual runs. There appeared to be but two solutions, one being to enlarge the operations by erecting more hatcheries, and the other to so regulate the taking of fish, as to permit an increased escapement of mature salmon to the natural spawning areas or beds.

Numerous hearings called by the Board only emphasized the fact that the efficiency of both methods was mooted questions and as an increase in the magnitude of operations in artificial propagation necessitated the expenditure of large amounts of money not then available, the method of increased natural propagation was adopted. This method, of course, made necessary certain restrictions as to the taking of fish, and in a way lessened the operations of canneries, notwithstanding which the increased annual pack leads to the incontrovertible conclusion, that the annual runs are increasing in magnitude and while the increase has not been as marked as was the preceding decrease, the situation at the close of the present biennium must convince the most skeptical that the matter of the magnitude of the fisheries of this state lies wholly with the citizens themselves. The pack of * * * * 1925, * * * * is conclusively demonstrating that salmon runs can be rehabilitated.

That the present increased runs can be largely augmented can hardly be contested in the light of present conditions. The process, however, must necessarily be slow owing to the constant destruction of spawning areas by the requirements of civilization, unless the people of the state desire a rapid increase and are willing to equip the Department in a manner to make same possible. Artificial propagation under proper conditions can very greatly hasten the process, and an increase in the facilities of the Department would undoubtedly prove to be a profitable investment, * * * * and * * * * a substantial balance in the Fisheries Fund is now available for a considerable increase in propagation work, such as the building of several additions to present hatcheries and the enlargement of rearing pond facilities.

Biological surveys have been made during the past four years, under the direction of the Board, the purpose being to determine the maximum carrying capacity of the salmon streams of the state. This work is still progressing and eventually the Department will be reasonably well advised as to the possibility of the several streams' being capable of caring for more spawning fish than are now being permitted to enter them.

The quantity that is permitted to enter the streams can only be regulated, in a manner by shortening or lengthening the period during which the fish may be taken from the water and by increasing or decreasing the present preserves or closed areas.

When the writer, as Acting Supervisor, was made Secretary of the State Fisheries Board, it was found that the data accumulated over a period of over four years was very considerable, and not sufficiently indexed and properly cross-referenced to make it quickly accessible. Beginning with April 1, 1921, the Board met almost continuously for several months, either in conferences in the preparation of regulations for fishing, or in holding public hearings in their office or in the various fishing districts over the state. To get all the data, correspondence, minutes and reports of the many hearings properly indexed permission was secured to have the entire accumulated records properly classified and cross-referenced. The chron-

ology of all these records was arranged in the order of consecutive dates and the gist of all matter prior to September 23, 1925, which included the framing of Fisheries Board Order No. 14, was transferred to cards (some 7000 all told) and rewritten for sequence. The high lights of each communication or subject or hearing were set down on the cards, in other words a complete digest of all material is ready for instant use to any one informed, from the cross references in the bound volumes of correspondence, hearings, pamphlets, Attorney General's opinions and other matter.

In checking over this exhaustive supply of information with the regulations, which gradually came to include the many more important phases of our fishery, especially the taking of and the protection and perpetuation of our salmon, it is noted that the commercial fishing areas for this class of fish in the state of Washington through these regulations have been reduced approximately one-third. In like measure the open commercial fishing seasons for salmon have been reduced and the minimum commercial length of salmon has been increased. The 18-inch minimum commercial length for salmon and the setting forward of the spring fishing season to May 1st, in Puget Sound, especially, have probably done as much as anything else to save the dumping of tons of small immature, young salmon on the markets, often glutting it, which caused the wastage of unsold fish not usable in any other avenue than the fresh fish trade. This annual wastage of immature salmon, called salmon trout, is reported to have existed each spring prior to 1921.

In the parts of the upper Puget Sound, southerly and easterly of Admiralty Inlet, where some of the favored feeding grounds of the immature salmon are to be found, the minimum size of the mesh in the spillers of the pound nets, or traps, and all seines has been increased to 5 inches stretch measure during the period from May 1 to July 25 each year, thus allowing the small salmon to escape and to return several years later, matured and enhanced in value many times when finally sold in the fresh markets or to the canneries and processors. Likewise the commercial fishing for salmon with set nets, gill nets and dip nets has been prohibited in all but two of the rivers entering Puget Sound, and in addition to this, three mile limits or preserves have been established off the mouths of the many tributaries of this body of water, as well as along the coast of Washington. In only two river mouths has any fishing been permitted to continue, the Skagit and the Snohomish, and although large mesh nets only are permitted, and weekly closed seasons maintained, it is still doubtful if fishing in these rivers is allowed to continue whether it will not eventually work a hardship on the parent stocks in these wonderful salmon streams. During the late summer and early fall in both the upper and lower Sound, ten day closed periods are maintained, which allow large escapements of sockeyes and pinks or humpback salmon to the Fraser River in British Columbia and its tributaries, as well as the return of spawning Chinooks, silvers, dogs or chums, and steelhead trout to their parent streams in Washington waters. The upper Columbia and Snake River fishing has been reduced and no commercial salmon fishing is allowed at all in any of the other Washington tributaries of the Columbia River, excepting a short distance up the Cowlitz during limited periods and with larger mesh nets. In Grays and Willapa Harbors salmon fishing has been restricted and seasons shortened so as to permit a more adequate escapement and it can

be said that as a whole all over the commercial fishing areas of the state a gradual increase in escapement is very apparent. This noticeable increase in the numbers of spawning salmon, while small, is indicative of right principles, based on sound conclusions made after careful study of local conditions, which, in some instances may, in time, need additional restrictions whereas in others, small reductions may be in order. No very great reductions of the restrictions should be attempted, however, until at least another four year cycle has been accomplished.

As regards the fishes which now attract a lesser demand commercially it might be remarked that they have not been overlooked, even though salmon have demanded a major consideration. Several constructive regulations are already in the Board's orders to conserve and perpetuate the present supply of these fishes, both of the bottom and surface swimming varieties, until such time as their commercial value will be increased. Even before the activities of the State Fisheries Board several extensive herring preserves were established and the regulation which now prohibits the use of nets under 5 inches stretch measure in the upper Puget Sound from May 1 to July 25, automatically provides a like closed season for smelt, herring, perch and other small surface swimming fishes. The minimum mesh of smelt and herring nets has been increased and a weekly closed season throughout the open fishing season for these varieties is now enforced, thus providing additional protection.

CONTINUED UPGRADE IN WASHINGTON'S FISHING INDUSTRY APPARENT.

The reports for the biennial periods ending with the years 1920 and 1922 respectively called attention to the sharp falling off in the fishing industry at the close of the fiscal year of 1919 and also the lessened production in 1920 and 1921, due in part to overfishing, and also to the readjustments caused by the post-war period, which were still very apparent in the fiscal year of 1922.

To follow up the brief comparisons shown in the 1921 and 1922 survey of conditions it was noted that the combined values of the various fishery products marketed during 1921 amounted to \$9,806,931.02 and in 1922 to \$9,014,486.10, a total of \$18,821,417.12 for the biennium, and these values were based upon the average wholesale prices received. It was agreeable to note that in 1923 the total was \$12,897,208.33 and in 1924, \$10,381,204.64, a total of \$23,278,412.97, an increase for that biennium of \$4,456,995.85. In 1925 the yearly comparative tables of all fisheries products processed or handled in Washington show a total value of \$15,311,822.36 and in 1926, \$10,684,187.65. The total for the biennium being \$25,996,010.01, an increase over the biennium ending in 1924 of \$2,717,597.04, notwithstanding a considerable reduction in the average prices of some of the commodities handled.

Continuing comparisons outlined in the biennium mentioned above, we are reminded that in 1919 the total value of canneries operated in the state and their fishing appliances and capital invested amounted to \$19,565,261.73; in 1920 this figure had dropped to \$11,628,080.48; in 1921 to \$14,505,320.99; and in 1922 to \$9,718,321.06. The year 1923 showed an increase to \$12,036,453.30, while 1924, being the off year for humpback fishing on Puget Sound, showed \$8,076,215.65. In 1925 this composite

figure had again risen to \$20,116,577.81, while 1926 was \$13,893,306.23, an advance over 1924 of \$5,817,090.58.

In the preparing of the above totals, year by year, they have never included the values of independently owned and operated traps, purse seines, gill net boats and other gear including trolling boats, which would add several millions to the above valuations. It cannot help but impress the general public with the fact that the fishing industry of Washington is slowly recuperating from the low ebb of 1920, and this with less commercial gear operating and smaller areas open to commercial fishing than was the case in 1919, and 1920, and the years previous.

Although this summary of conditions prevailing during the past biennium and its comparison with previous years is necessarily brief, it would be out of order not to call attention to the gradual growth and value of the business which is done in fresh food and shell fish and the many activities in processed (other than canned) fish of all kinds. Salmon again predominates in the tonnage salted, mild cured and kippered, and the use of large quantities in this manner cut down the total salmon canned, which results in misleading comparisons by those who use pack totals only when discussing commercial fishing conditions, thus innocently advancing conclusions which are entirely unfair to the industry, and misleading to the people of the state.

FOOD AND SHELL FISH, FRESH AND PRESERVED (OTHER THAN CANNED) AND VALUE.

YEAR	Number of Pounds	Value	YEAR	Number of Pounds	Value
1919.....	16,200,864	\$1,670,756 11	1923.....	31,864,250	\$3,654,512 38
1920.....	16,840,104	2,153,736 49	1924.....	31,494,315	3,434,032 31
1921.....	23,210,034	2,249,829 67	1925.....	33,504,069	3,449,075 45
1922.....	19,413,023	2,104,673 52	1926.....	34,378,823	3,510,846 64

You will note that the biennium total for 1919 and 1920 was 33,100,468 pounds valued at \$3,824,491.60; for 1921 and 1922, 42,623,057 pounds, valued at \$4,354,497.19; 1923 and 1924, 63,348,574 pounds, valued at \$7,088,544.69, an increase in values over the preceding biennium of \$2,734,047.50, and in tonnage 20,725,517 pounds. The total tonnage of the 1925-1926 biennium just ended is 67,882,882 pounds exceeding 1923-1924 by 4,524,308 pounds, while the value decreased \$128,622.60. Average prices reported were somewhat lower than in 1923-1924, which accounts for this value reduction, and the renewed activity in salmon canning in 1925-1926 may account for the lessened increase of the 1925-1926 biennium over 1923-1924 as compared to the increase of 1923-1924 over 1921-1922. From the above tables the year 1920 shows the peak in value as compared to tonnage.

In reviewing the activities in the canning of food and shell fish it would be useless to draw comparisons by including figures from the war period, where the demand for increased food stores and excessive values of some disturbed natural conditions. Although a distinct downward trend in market values is noticeable in the period from 1919 to 1926, present conditions are still not comparable with the prewar period. The canning of

salmon and razor clams forms the bulk of Washington's fish and shell fish canning. The past four biennium packs and values show as follows:

BIENNIUM	Cases	Value	BIENNIUM	Cases	Value
1919-1920.....	2,014,676	\$17,487,597 52	1923-1924.....	1,615,661	\$12,596,341 45
1921-1922.....	1,368,674	10,596,341 45	1925-1926.....	1,801,410	15,416,912 01

The present indications for 1927-1928 based on pack returns now on hand (1927) when this report is being prepared would seem to indicate the prospects of a decided increase in pack and value over the period this report covers.

Details of the present biennium pack may be found in the detailed statistics following page 94, but for quick reference totals for 1925-1926 are set out and compared with 1923-1924.

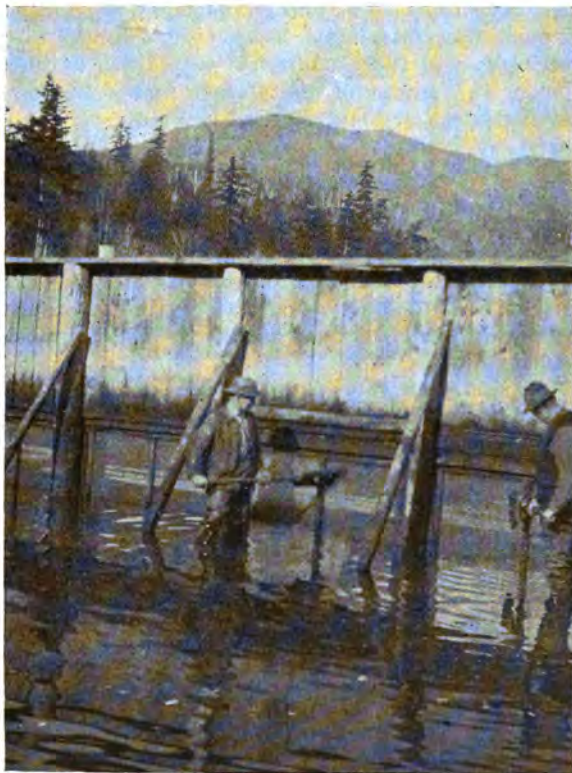
	1923-1924		1925-1926	
	Cases	Value	Cases	Value
Chinook salmon.....	242,508	\$3,402,481 72	352,504	\$4,597,258 70
Dog or chum salmon.....	357,559	1,610,095 44	251,543	1,084,657 69
Humpback or pink salmon.....	478,264	2,354,149 31	559,573	2,907,538 45
Silver salmon.....	267,257	1,773,156 60	340,609	3,091,062 94
Sockeye salmon.....	165,645	2,492,845 35	166,874	2,628,209 79
Steelhead salmon.....	25,023	243,067 10	11,326	130,119 34
Clams and mussels.....	74,755	689,483 61	109,897	973,872 51
Clam nectar.....	3,227	12,418 49	3,293	9,716 77
Crabs (1923 only).....	431	8,331 90	.....	.....
Shad.....	983	10,131 93	5,683	22,745 21
Other food and shellfish.....	9	180 00	108	1,730 61
Totals.....	1,615,661	\$12,596,341 45	1,801,410	\$15,416,912 01



Salt Water Rearing Pond, Quilcene Bay.

EXPERIMENTS IN TRANSPLANTING PINK OR HUMPBACK SALMON.

Because of the success which has generally followed the transplanting of silver and Chinook salmon to new environments, such as the augmenting of the runs of Chinook salmon in Puget Sound waters, it was decided to secure humpback eggs from fisheries authorities in Alaska in exchange for Chinook eggs from this state. Eggs were secured in 1922 and 1924 and placed in hatcheries adjacent to the streams flowing into Puget Sound. The fry hatched from the 1922 pink eggs brought from southwestern Alaska



Salt Water Rearing Pond. Cleaning Dyke Screens.

were planted early in 1923, and being a two-year fish, completing the life cycle in two years, some indications of results were expected in the 1924 fishing season. In this the department was not disappointed, for in 1924 the pink run came in considerably in advance of their usual time of arrival and fishermen reported a considerable majority of their catches of pinks being of the Alaska variety. It was later learned that in 1924 the traps along the west coast of Vancouver Island, which had never caught pink salmon in the even numbered, or off years for this variety, reported total catches of more than 20,000 small pinks, resembling the Alaska variety which had been transplanted.

The Washington catch of pinks reported in 1924 was a little over 100,000 which exceeded considerably the 1922 total of 32,315 and 1920 with a total pink catch of 19,716, however, from a double amount of eggs secured in 1924 it was anticipated that in 1926 results should be more apparent, especially as the return of pinks in 1924 came so early in the fishing season that a considerable quantity should have escaped to spawn. Excess of pinks returning to spawn in the Puget Sound streams where the transplants were placed after hatching late in 1922, were not noticeable, however, and the fishermen's reports of pink salmon taken in 1926 showed a total of only 24,489 fish.

Some of the fry of the 1924 pink transplants were placed in the salt water feeding pond, described in the last report, and several thousand were marked, but no returns of these salt water reared fish developed.

In 1926, upon the advice of the United States Bureau of Fisheries, it was thought that a larger pink could be secured from the Karluck River on Kodiak Island, where the excess of these fish in 1924 seriously impaired the sockeye run in this stream. A party was sent north to secure eggs there but very few pinks showed up and the only eggs secured for hatching and planting in Puget Sound streams came from the government. These were hatched the past winter on Hoods Canal and some of them placed in the salt water rearing pond on Quilcene Bay from which they will be liberated late in June of the next biennium. As many of these as possible will be marked and in 1928 fishermen will be notified of these markings and rewards offered on same.

The great runs of pink salmon appear in the odd numbered years in the Puget Sound District, which comprises all the tide waters of the Straits of Juan de Fuca, Georgia Straits, Washington Sound and Puget Sound, while the even numbered years, as noted above, are comparatively lean of these fishes, and if a pink run of any magnitude whatever could be developed in the even numbered years, a corresponding stabilizing of the salmon canning in Puget Sound might eventuate, but successful results of these experiments are exceedingly doubtful; in any event, this undoubtedly would take years in developing and should not be condemned after such a short period of experiment.

COMMENTS ON CHARTS.

The following diagrammatic charts are designed, to give at a glance the take of salmon by gear. It is interesting to note relatively uniform heights of the columns indicating that the catch by gear is somewhat constant when taken over a period of years.

This is a vital point since any stable business must have a satisfactory, uniform supply of raw material. The diagrams also suggest that certain types of gear are particularly effective in taking certain species of salmon; but are practically useless in taking other species. A notable example is the Columbia River fish wheel; although the records show that wheels take about 35% of the sockeyes on the river, they only take about 3% of the Chinooks and $\frac{1}{2}$ of 1% of the chums.

Public opinion has been molded to receive the impression that this type of gear is particularly deadly, which the records do not seem to bear out, since in the 12-year period, 1915-1926, fish wheels have taken but 6.4% of all salmon caught on the Columbia River.

TAKE OF PUGET SOUND SALMON AND PERCENTAGES BY GEAR													
STATE OF WASHINGTON 1915-1926 COMPILED BY DIVISION OF FISHERIES													
Years	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	
Chinooks	No. 301,192	301,170	440,864	472,246	341,766	271,924	268,982	208,359	229,624	245,501	294,496	251,129	316,536
Percentage	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00	PN 0.81 SA 0.19 OG 0.00
Chums	No. 189,448	188,447	109,515	118,571	175,091	68,100	270,193	502,230	632,882	859,789	534,812	103,695	104,883
Percentage	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00
Humpbacks	No. 736,713	618,098	634,260	710,449	1,661,600	75,566	440,516	32,789	5,579,006	1,000,046	666,595	24,489	42,300,997
Percentage	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00
Silvers	No. 1,082,996	1,082,998	730,442	1,637,525	1,362,153	589,505	762,221	872,360	887,469	946,720	869,013	703,292	1,765,199
Percentage	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00
Sockeyes	No. 804,365	804,367	436,933	581,431	744,694	652,603	1,125,475	505,551	481,387	746,839	1,242,200	111,767	1,010,180
Percentage	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00	PN 0.15 SA 0.85 OG 0.00
Steelheads	No. 38,452	39,655	28,133	34,650	24,698	18,114	5,914	6,696	7,691	11,352	8,944	10,199	232,453
Percentage	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00
ALL SPECIES COMBINED	Total No. Salmon 1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578	1,170,578
Percentage	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00	PN 0.05 SA 0.95 OG 0.00

Average weights- Chinook-22lbs, Chum-10lbs, Humpback-48lbs, Silver-8lbs, Sockeye-7lbs, Steelheads-9 1/3
 Total take all species combined, during 12 years, per 12 year period - PN - Traps or Pound Nets - 42.3 %
 G.N.- Gill Nets 3.5%, P.S.- Purse Seines 51.9%, H-L-Troll or Hook-Lines 0.6%, O.G. - all other gear 1.7 %

TAKE OF COLUMBIA RIVER SALMON AND PERCENTAGES BY GEAR														
STATE OF WASHINGTON 1915-1926 COMPILED BY DIVISION OF FISHERIES														
Species of Salmon		Year												12 Year Totals
Year	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926		
Chinook No.	367,361	367,371	690,462	450,783	414,666	320,393	200,048	148,667	274,706	319,993	393,940	342,037	4,112,899	
	Percentage	47.5	47.5	58.9	39.8	36.7	23.9	16.8	34.8	40.5	49.5	41.4	39.8	
Chum No.	59,716	59,717	100,615	46,817	108,579	42,791	20,995	20,777	71,913	136,719	123,983	62,471	851,239	
	Percentage	16.0	16.0	14.1	10.3	12.6	2.4	1.4	21.4	19.1	15.7	18.2	10.0	
Humpyhead No.	11,729	2,472	5,276	10,362	1,700			2,083					48,518	
	Percentage	3.2	0.7	0.8	2.2	0.2		0.2					0.5	
Steelhead No.	113,179	113,581	42,700	243,970	192,253	64,297	118,643	76,643	221,601	232,736	115,761	146,104	1,715,418	
	Percentage	30.0	30.2	6.2	23.1	22.3	13.6	52.1	30.3	15.8	12.8	18.5	29.2	
Sockeye No.	57,840	57,841	78,181	762,777	51,771	26,426	36,353	19,229	204,351	31,293	3,110	105,476	1,093,999	
	Percentage	15.6	15.6	11.2	57.9	12.2	3.2	2.6	29.0	2.2	0.1	14.9	10.5	
Salmon No.	178,614	178,614	143,684	14,664	9,683	618,71	63,900	51,697	166,858	142,777	19,015	212,104	1,447,250	
	Percentage	48.0	48.0	20.7	1.4	0.2	74.4	34.8	58.4	4.4	0.5	29.3	13.0	
All Species Combined	791,507	791,507	1,515,222	1,156,403	876,678	565,778	425,088	541,959	745,377	906,379	833,477	670,298	9,758,983	
	Percentage	100	100	100	100	100	100	100	100	100	100	100	100	
Gear		Gear												
Trap														
G.N. Gill Net														
D.S. Drag Seine														
S.N. Set Net														
H.L. Troll or Hook + Lines														
P.S. - Purse Seines														

Average weights - Chinook-23lbs. Chum-9lbs. Silver-10lbs. Sockeye-5lbs. Steelheads-10lbs.
 Total take all species combined, during 12 years, by all gear. 9,758,983 salmon
 Gears used and percentages taken by each gear, 12 year period
 Tr. - Traps 37.9% G.N. Gill Nets 36.6%
 F.W. Fish Wheels 6.4% D.S. Drag Seines 7.1%
 S.N. Set Nets 2.1% H.L. Troll or Hook + Lines 5.8%
 P.S. - Purse Seines (not operated since 1921) 4.1%

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TAKE OF GRAYS HARBOR SALMON AND PERCENTAGES BY GEAR 1915-1926

STATE OF WASHINGTON COMPILED BY DIVISION OF FISHERIES

Years		1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	Total for Period
Chinooks	No.	41885	43884	44460	29326	26946	21757	31725	30299	32508	44880	22672	13028	363132
	Percentages													
	Gear	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000
Chums	No.	8449	8448	4378	2150	18124	18722	18668	7147	14528	14306	27529	3587	156282
	Percentages													
	Gear	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000
Humpbacks	No.	73	1388	8	161	4205	150	374						6359
	Percentages													
	Gear	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000					
Silvers	No.	7615	7613	9024	14032	9535	74353	7135	10236	14468	8449	57657	6559	108206
	Percentages													
	Gear	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000
Sockeyes	No.	131	132	723	1151	662	1035	1566	177					4441
	Percentages													
	Gear	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000				
Steelheads	No.	3992	3441	6347	3876	6607	4899	2346	1734	1160	1041	1401	110	38940
	Percentages													
	Gear	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000
ALL SPECIES COMBINED	Total No. Salmon	201240	210601	189340	207454	318047	269100	40414	205235	315551	220176	201734	16349	2164226
	Percentages													
	Gear	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000	P.N. 0.000 S.N. 0.000 H.L. 0.000

Average weights - Chinook-23 lbs., Chum-12 lbs., Humpback 4 lbs., Silver-10 lbs. Sockeye-6 lbs., Steelheads-10 lbs.
 Total take all species combined during 12 years, by all gear 2464226 salmon
 Gear used and percentages taken by each gear, 12 year period
 P.N. - Traps or Pound Nets 43.6 %
 H.L. - Troll or Hook-Lines 1.1 %
 S.N. - Gill Nets 31.0 %
 S.N. - Set Nets 24.3 %

TAKE OF WILLAPA HARBOR SALMON AND PERCENTAGES BY GEAR 1915-1926
STATE OF WASHINGTON COMPILED BY DIVISION OF FISHERIES

Years	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	Light Gear (1915-1917)		
Chinook	No. 28,256 Percentage 49.2% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 20,255 Percentage 48.8% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 25,496 Percentage 50.8% Gear P.N. 0.025 S.W. 0.012 H.L. 0.002	No. 15,657 Percentage 45.3% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 52,292 Percentage 51.8% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 12,300 Percentage 48.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 9,958 Percentage 49.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 7,446 Percentage 48.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 2,941 Percentage 48.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 8,497 Percentage 49.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 11,641 Percentage 49.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 19,191 Percentage 49.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 910,455 Percentage 49.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002		
Chum	No. 66,028 Percentage 70.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 66,129 Percentage 70.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 81,765 Percentage 75.4% Gear P.N. 0.025 S.W. 0.012 H.L. 0.002	No. 43,507 Percentage 69.7% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 64,327 Percentage 69.7% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 14,042 Percentage 56.5% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 13,863 Percentage 57.4% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 12,267 Percentage 57.4% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 52,769 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 125,201 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 213,368 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 94,232 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 151,448 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002		
Humpback	No. 531 Percentage 100% Gear P.N. 1.000	No. 2,228 Percentage 100% Gear P.N. 0.042 S.N. 0.879	No. 42 Percentage 100% Gear P.N. 1.000	No. 20 Percentage 100% Gear P.N. 1.000	No. 6,739 Percentage 100% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002								No. 7,560 Percentage 100% Gear P.N. 0.041 S.N. 0.911 P.S. 0.048		
Salmon	No. 38,491 Percentage 53.4% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 31,493 Percentage 52.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 42,368 Percentage 53.4% Gear P.N. 0.025 S.W. 0.012 H.L. 0.002	No. 87,185 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 43,776 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 12,572 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 9,604 Percentage 53.4% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	No. 5,177 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 2,833 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 7,794 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 21,006 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 30,425 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 383,854 Percentage 53.4% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002		
Sockeye	No. 495 Percentage 100% Gear P.N. 1.000	No. 416 Percentage 100% Gear P.N. 1.000	No. 85 Percentage 100% Gear P.N. 1.000	No. 97 Percentage 100% Gear P.N. 1.000	No. 526 Percentage 100% Gear P.N. 1.000		No. 465 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002							No. 1,501 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	
Steelhead	No. 682 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 681 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 2,037 Percentage 100% Gear P.N. 0.025 S.W. 0.012 H.L. 0.002	No. 626 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 1,664 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 4,545 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 2,860 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 114 Percentage 100% Gear P.N. 1.000	No. 271 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 1,742 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 840 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 573 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	No. 1,615 Percentage 100% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002		
ALL SPECIES COMBINED	Total No. Salmon 114,350 Percentage 49.2% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	Total No. Salmon 136,202 Percentage 48.8% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 151,193 Percentage 50.8% Gear P.N. 0.025 S.W. 0.012 H.L. 0.002	Total No. Salmon 142,171 Percentage 45.3% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 162,670 Percentage 51.8% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 150,462 Percentage 48.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 135,989 Percentage 49.7% Gear P.N. 0.027 S.W. 0.012 H.L. 0.002	Total No. Salmon 120,148 Percentage 48.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 588,144 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 1,174,194 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 2,463,315 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 1,802,241 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002	Total No. Salmon 1,184,469 Percentage 60.9% Gear P.N. 0.028 S.W. 0.012 H.L. 0.002		

Average weights - Chinook-23 lbs., Chum-12 lbs., Humpback-9 lbs., Silver-10 lbs., Sockeye-6 lbs. Steelhead-10 lbs.
 Total take all species combined, during 12 years, by all gear 1,184,469 salmon
 Gear used and percentages taken by each gear, 12 year per iod.
 P.N. - Traps or Pound Nets 50.9% G.N. - Gill Nets 18.7%
 H.L. Trawl or Hook-Lines 0.2% S.N. - Set Nets 18.7%
 P.S. - Purse Seine (not operated since 1921) 11.5%

Unfortunately the fisheries industry feels the effect of the narrowed views of the laity from time to time since very few remedial measures suggested are broad in scope but usually concern a limited situation and with countless problems looming up, were these suggestions followed, chaos would inevitably result.

The establishment of closed areas and the curtailment of the fishing season is the most impartial solution. The wonderful increase of salmon on Puget Sound during the past 5 years is directly traceable to this policy which was inaugurated in 1921.

The maintenance of preserves, where all types of gear are prohibited from fishing, is a simple matter, and does not result in the continuous bickering between operators of various types of gear. Further than this it permits the fish to get to their spawning grounds unmolested, which is the vital point.

From a standpoint of sensible conservation it matters not how fish are taken, but the fact that they are dead certainly ends their usefulness for perpetuating their kind.

Passing from brief consideration of the commercial side of the department's work, your attention is drawn to the brief report on fish cultural operations prepared by Mr. L. E. Mayhall, General Superintendent of Hatcheries.

In checking up the fish cultural operations of the Division of Fisheries at about the time of the close of the last biennium, I had Mr. Mayhall prepare a brief historical review of salmon hatchery operations since the inception of this most important part of the activities of this department, and this review was printed on page 17 of the 34th and 35th Annual Report for the period ending March 31, 1925.

During the first two years of the previous biennium no particular expansion work was entered into by the department, due principally, it is supposed, to a limited amount of funds. In fact some necessary repairs and upkeep were neglected. Operations were conducted at a minimum of cost for that period, but the neglect of necessary repairs and upkeep made additional expense in this line necessary during the past biennium.

FISH CULTURAL OPERATIONS.

One of the early conclusions of the State Fisheries Board was to the effect that the dumping of millions of young salmon fry in our streams without first increasing their size to some extent through rearing, was not giving these young fry a fair chance considering the number which were consumed by other fishes, noticeably the cutthroat and steelhead trout in the spawning streams. Experiments having been conducted at various times in different hatcheries with the common dirt bank rearing ponds of varying shapes and sizes with only partial success, it was decided that the building of standard concrete walled rearing ponds, similar in design to a rearing pond proposed by the writer as early as 1903, would be the most economical for our needs over a long period of time and the easiest to maintain if same were constructed of concrete; built in series so that the wall of one pond would form the wall of another; that each one be provided with a separate water supply and a separate discharge; and rounding them at the ends with a center wall so that a continuous movement of the water in one direction could be had. Cuts of this type of pond

appeared in the last biennial report and are reprinted in this issue for the information of those who might be interested.

Three ponds of this type were built at the Auburn Hatchery in 1923 and in 1924 six more were constructed making a series of nine in all at this hatchery. Also, four of these ponds were under construction at the close of the biennium ending March 31, 1925, in the Kalama Hatchery.

The only other improvement undertaken was the rebuilding of the Auburn water supply system undertaken in 1924 which brings the waters of Soos Creek, in an eighteen inch main, one and one-quarter miles to the hatchery, thus providing an ample supply of water for the old hatchery then in operation and for considerable additions in hatchery equipment and rearing pond expansion.

Basing the activities of this past biennium on the recommendations of the Fisheries Board for expansion work especially along the lines of increased rearing capacity for rearing young salmon, an active construction program for this administrative period was outlined. With the increase in the annual receipts in sight for the Fisheries fund, it was possible to start construction work early in 1925.

GREEN RIVER HATCHERY.

Six more of the standard circulating concrete rearing ponds have been completed at the Green River Hatchery making a total of fifteen and a rearing capacity of ten million, in addition to what rearing could be done in the old dirt ponds which had been in operation at this hatchery for several years.

The feeding problem at the various hatcheries has been met up to the present writing in a very convenient manner, as the department was able to secure from the United States Government upwards of 20,000 cases of war canned salmon which were purchased for war purposes and were not permitted to be used in commercial lines on account of being around in



Green River Hatchery, near Auburn, showing warehouse (1925) and new hatchery (1926) and arrangement of standard rearing ponds.

quartermasters' warehouses under adverse conditions in some instances for a considerable period following the war. This canned salmon had been stored in warehouses in Seattle for two or three years at a cost of approximately \$200.00 per month, and it was decided that the warehousing expense for holding this fish food for this past biennium would be a sum equal to what it would cost to build a permanent warehouse at the Green River Hatchery, which hatchery is more nearly centrally located than any other in the state, as well as being the nearest to the office of the department in Seattle. Permission was secured to build a warehouse 60 x 100 feet which not only houses the remaining canned salmon, but provides storage and clearance for tools and equipment needed at various times in different parts of the state and for any other necessary storage.

During the summer of 1926 a new modern hatchery, 72 x 152 feet in size was built containing space sufficient to handle 160 hatching troughs and 72 tray troughs which makes a fry capacity of 27,000,000 and an egg capacity of considerably over 40,000,000 eggs. In building this hatchery, it was considered economy to build all permanent construction from the ground up to the window sills and up to the troughs themselves of concrete, thus placing all wood construction and framing above the, moisture constantly caused by the circulating water used in the hatchery operations. The old hatchery was entirely wrecked and use of any salvage material was made in the erection of the new hatchery.

The egg take for the past two years at this hatchery has been in excess of 54,500,000, which undoubtedly makes this the most important hatchery station in the state.

KALAMA HATCHERY.

Four more standard rearing ponds were built in 1925 at the Kalama Hatchery, which now has a fry capacity of 14,000,000, and a rearing capacity of 7,300,000, consisting of 20 rearing ponds, 8 of which are of the modern circulating type. As this hatchery has an average egg take of 23,554,000 per year for the past ten years, additional hatchery capacity should be provided as it is necessary to transfer 9,500,000 eyed eggs per year to other hatcheries.

SAMISH HATCHERY.

The sills, joist and floor of the Samish Hatchery were removed, concrete footing put in and all hatchery trough supports placed directly on these concrete footings, thus dispensing with wooden floor construction and enormous replacement expense attendant thereto every few years.

CHINOOK HATCHERY.

During the summer of 1925 four standard rearing ponds were constructed at the Chinook Hatchery and a part of the new flume line reconstructed. In 1926 four more standard ponds were added and the flume line, 14 inches by 12 inches inside and 1950 feet long was completed. This flume furnishes an ample supply of water for operating the eight ponds and an old rearing pond previously experimented with with doubtful results was entirely abandoned. This hatchery now has a fry capacity of 2,300,000 and a rearing capacity of 4,800,000.

Taking Spawning Salmon at Kalama River Hatchery

Selecting ripe spawn fish



Spawning fish on table ready to take spawn



Temporary impounding racks



Hauling and landing seine



Photos by Geo. Halpin, 1910

Taking Salmon Eggs From Spawning Salmon at the Kalama River Hatchery, near Kalama, Wash.

WILLAPA HATCHERY.

A new hatchery building was completed at the Willapa Hatchery with a fry capacity of 7,500,000. The building is 54 feet by 140 feet and contains 210 hatching troughs with concrete walls up to the window sills, as well as concrete supports for the hatchery troughs.

CHEHALIS HATCHERY.

The old residence at this hatchery was wrecked, the lumber salvaged and a new modern seven room cottage built. The hatchery floor was removed and the supports of all hatching troughs placed directly on concrete footings doing away with wooden floor construction.

NOOKSACK HATCHERY.

The residence at this hatchery, similar in construction to the one at the Chehalis Hatchery was not so badly in need of repair and was raised and a concrete foundation put under it. New floors were laid level, the inside of the house plastered and plumbing and electric wiring were added. Cedar siding was put on over the old barn siding and painted, thus making a permanent and modern hatchery residence of good appearance.

WIND RIVER HATCHERY.

As previously noted, in the historical data on Washington Salmon Hatcheries, seining operations in the Columbia River below the mouth of the Wind River, as well as logging operations which floated thousands of logs down this stream, almost destroyed the run of Chinook salmon in



Salmon Fry Shortly After Hatching.

the Wind River, and for a time cut down the take of eggs to such a point, that maintaining a superintendent at the Wind River Hatchery made the cost of taking eggs almost prohibitive. In the past administration operations were discontinued for a time. However, being close to the Federal Hatcheries at Cook and Underwood, the Wind River Hatchery has been operated the past two seasons by the United States Bureau of Fisheries.

It is reported at this writing that the splash logging operations are practically completed on the Wind River and if such is the case, with the present regulations tempering the fishing operations in the Columbia, it would no doubt be practical to replace the old hatchery at this location with a modern structure, take all eggs possible and use the balance of the hatchery space to take care of the constant overage of Chinook eggs at the Kalama Hatchery. There is no doubt that if this is done the Wind River spawning area for Chinook salmon can be built up and eventually brought back to past production records.

COWLITZ RIVER HATCHERY.

The department has known for many years of the fine run of early Columbia River Chinook salmon which go up the Cowlitz River and spawn in its headwaters and tributaries. Early investigations of conditions, however, have shown that transportation conditions would hamper development work.

With the new state highway completed to within seven miles of Lewis, it was decided to take in temporary equipment and conduct experimental operations in the late spring and summer of this past year (1926). Considerably over two and one-half million eggs were secured in the Clear Fork branch, a little above its junction with the Ohanapecosh River where these streams join to form the Cowlitz River. The results obtained and the promise of early completion of a good road to within a short distance of the site chosen, prompted the immediate construction of a complete hatchery equipment; 7 room modern residence, hatchery building and water system; with monies appropriated from the Fisheries Fund by the second session of the 1925 legislature, and at this time the construction work is practically completed. Being in the Rainier National Forest Reserve, it might not be out of order to mention the cooperation extended by the United States Forest Reserve officers in our work of establishing this station.

Other possible locations are being investigated on the Cispus River, another tributary of the Cowlitz where salmon are reported spawning in large numbers, and it is possible that with the completion of the new highway to within a mile of the present hatchery at Clear Fork, other adjacent streams may be fished and the eggs handled at this station.

LEWIS RIVER—EXPERIMENTAL OPERATIONS.

The 1925 budget appropriations for new hatchery construction called for the building of one in the Lewis River water shed. The South Fork has never been considered much of a salmon spawning stream, and the earlier and disastrous attempts in the lower waters of the North Fork of the Lewis, prompted the Fisheries Board to approve an experimental operation along the upper reaches of this stream.

Early in April of last year (1926), the writer, accompanied by Mr. Pollock, Supervisor of Fisheries, Mr. Hugh C. Mitchell of Oregon and a

guide, drove in by car about three miles beyond Cougar, then went by trail nineteen miles up the North Fork of the Lewis to its junction with the Big Muddy Creek, where it was reported spawning beds were located and to where large quantities of the early royal Chinook migrated every year.

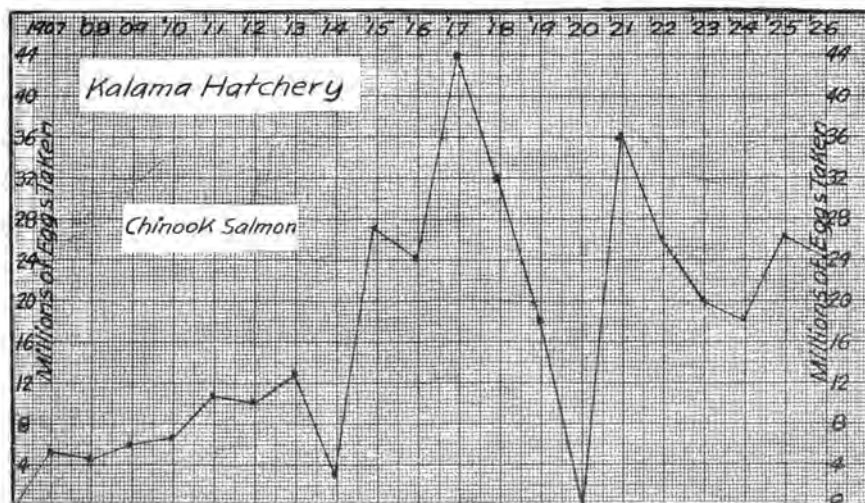
At that time of the year we observed in the waters of the Big Muddy a goodly number of large steelheads spawning, and it was decided to carry on operations in this neighborhood. A crew went in shortly afterwards and during the summer's work it was necessary to maintain a pack train, and to go to considerable expense to get supplies up by automobile to the end of the none too good county highway, about 40 miles from Woodland, Washington.

As it was possible to secure only 273,000 Chinook eggs after all this effort, the idea of permanent hatchery construction so far from transportation, is of course impossible, but our plan is to try out another location down the river about one-half the distance from Cougar this present summer (1927).

COMMENTS ON GRAPHS SHOWING SALMON EGG TAKE AT VARIOUS HATCHERIES.

The preceding brief survey of our salmon propagation work as outlined by the Superintendent of Hatcheries, reminded the writer of the many communications and verbal questions regarding the reasons for extending operations in some localities and the abandonment or curtailing operations in others, briefly discussed in the preceding biennial report.

Pictures tell stories quickly and more graphically than volumes of explanation and to show the growth of operations in some of our hatcheries, the following pages are devoted to graphs which roughly depict the history of the hatcheries which they represent. Graphs are not entirely satisfactory,



yet they will prove an economy for drawing comparisons and the statistics can then be consulted for details. It is well to keep in mind when scrutinizing these graphs that, since records prior to 1907 are entirely lacking or inadequate, the curves are started at the zero point at the left of the column for 1907, to establish this point, and gradually progress to the right of the column to the highest point for that year. DO NOT ASSUME THAT HATCHERY OPERATIONS BEGAN IN 1907.

Wide ranges in the curves are common and are readily explainable in most instances by one who has followed developments. The factors which tend toward radical changes are weather, stream conditions, commercial and illegal fishing, and many more minor factors which in the aggregate have very noticeable effects.

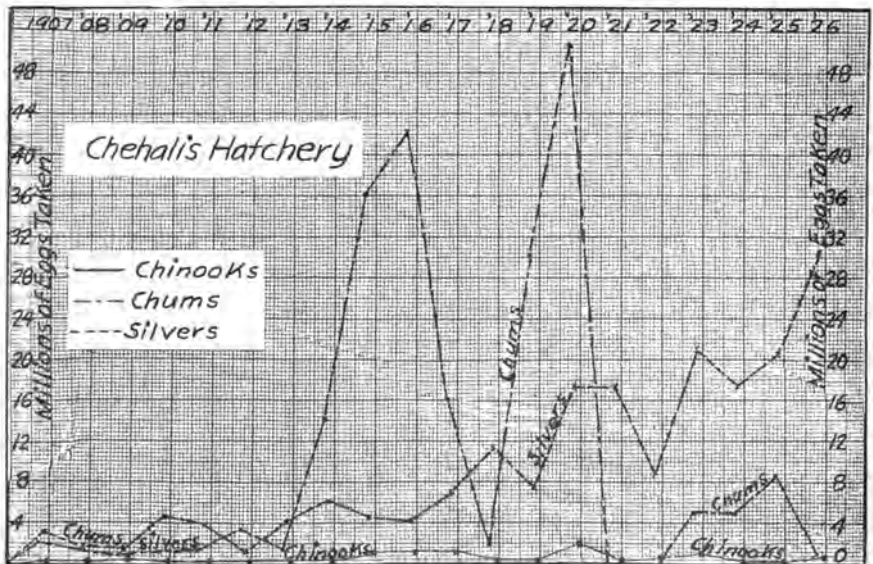
KALAMA HATCHERY.

Chinooks. It will be noticed that the tendency is toward a higher average yearly take as compared to the first years of operation. Each year this hatchery has a consistent supply of fall Chinooks, but high water conditions in the stream interfered with the taking of eggs in the years of 1914 and 1920 and indicated by the depressions on the graph.

CHEHALIS HATCHERY.

Chinooks. This hatchery takes a very negligible quantity of Chinooks since the racks are so high up-stream the Chinooks all spawn below the hatchery except in the case of very early high water.

Silvers. This is an example of the efficiency of hatchery operations in increasing the run of a species. It is to be expected that lean years will



obtain, but in most cases they are due to climatic or commercial fishery conditions.

Chums. The great variation of this curve is due to (1) policy (2) aggressiveness of commercial fishermen. Years ago it was the policy to slight chum eggs since chums were practically valueless. This was true in Grays Harbor for years. The zero depression is due to a policy under which no chum eggs were taken at all and finally a limit of about five million eggs per year was established. Commercial fishing for chums in the meantime had become quite remunerative and at present a rebuilding policy is in force. The succeeding years should show an upward curve on the graph.

NASEL HATCHERY.

During the years that it is possible to hold the temporary racks in the Nasel River the take at the hatchery is good. The yearly take is decidedly on the increase. This stream is fished by gill nets and traps and the last few years their take of Chinooks has been very encouraging.

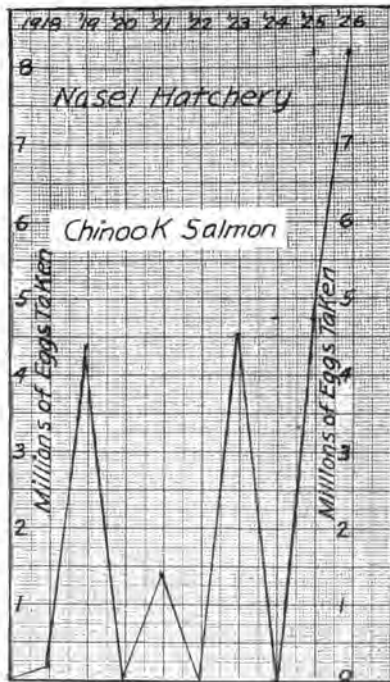
With this increased commercial take the hatchery is steadily increasing also; showing that a judicious use of natural resources can result in the perpetuation of a fine business.

GREEN RIVER HATCHERY.

Chinooks. With increased menaces Green River Hatchery is producing annually a consistent number of eggs. The tendency the past few years is toward a substantial increase. This is especially noticeable in the take on Soos Creek at the hatchery. The bulk of eggs originally were taken from a rack in the Green River, but in recent years with no encouragement the Chinooks are entering Soos Creek indicating that planting in that stream has had its vital effect.

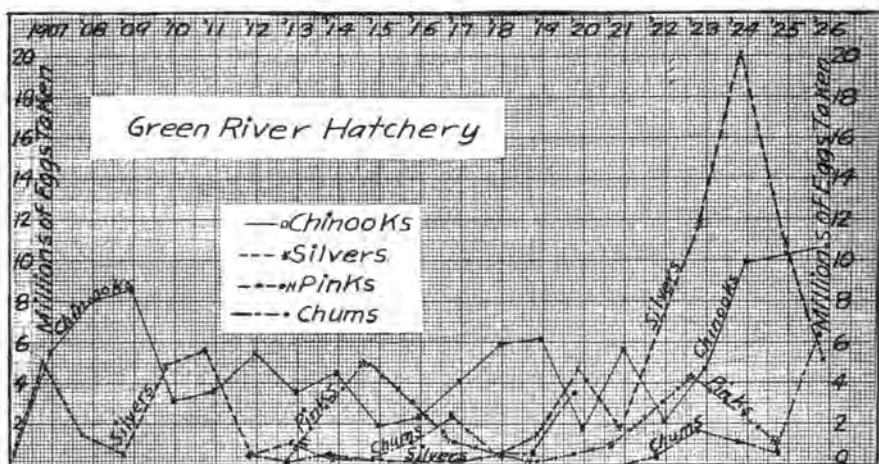
Silvers. Since 1922 the silvers have been greatly on the increase. The 1924 run was phenomenal with ideal conditions for taking. The cyclic return is awaited with interest, the hope being that with similar conditions a further increase will be noted. It would appear that 1924's take was the result of a fair year in 1920.

Chums. Chums appear to be uncertain. The zero depression is due to policy and only the consistent taking of chums for a continued period under similar conditions will give us any true indications.



Humpbacks. Since very few pinks are taken in the temporary racks across the Green River, this graph has little value. Pinks do not "run" in Soos Creek on which the racks are permanent, so only a few of the early pinks are stripped for eggs.

Puyallup Hatchery which is located on a pink stream shows a tremendous cyclic return of pinks.



SAMISH HATCHERY.

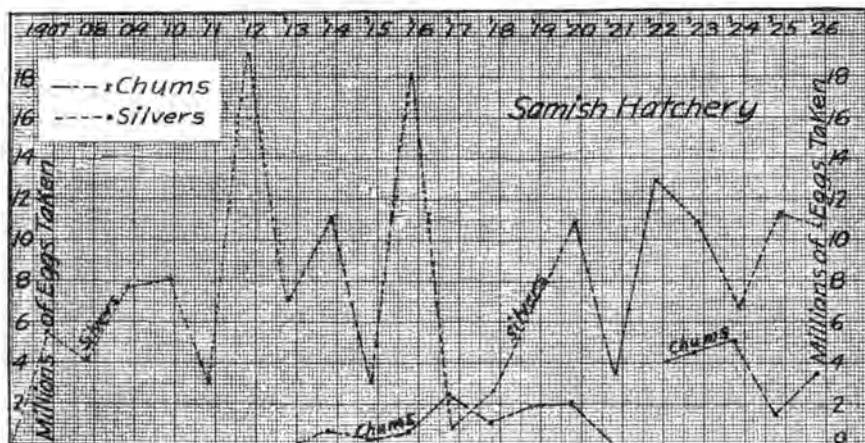
Silvers. This graph depicts clearly cyclic effects. Many conditions work to create considerable variations, such as water conditions, storms, commercial fishing, illegal fishing, etc., yet the indications of cycles obtain to a greater or lesser degree. The run of silvers in Samish River is phenomenal, having kept up through a period of increasing menaces with wonderful regularity.

The permanent racks were dynamited in 1917, letting the spawn fish escape and indicated by the depression on the graph.

Chums. As the graph indicates, the chums in earlier days were taken very spasmodically. Of recent date they are not overlooked, but too short a time has elapsed to prove whether Samish is suitable for their establishment in any number.

ALL DISTRICTS.

Chinooks. The general trend is upward in all districts with the exception of Grays Harbor. The lack of increase in this district is due to the location of all the hatcheries, each being so high upstream that the early Chinooks spawn far below there. This is also true of several hatcheries in other districts but time will undoubtedly see effort expended in making provisions to take Chinooks on these lower reaches also.



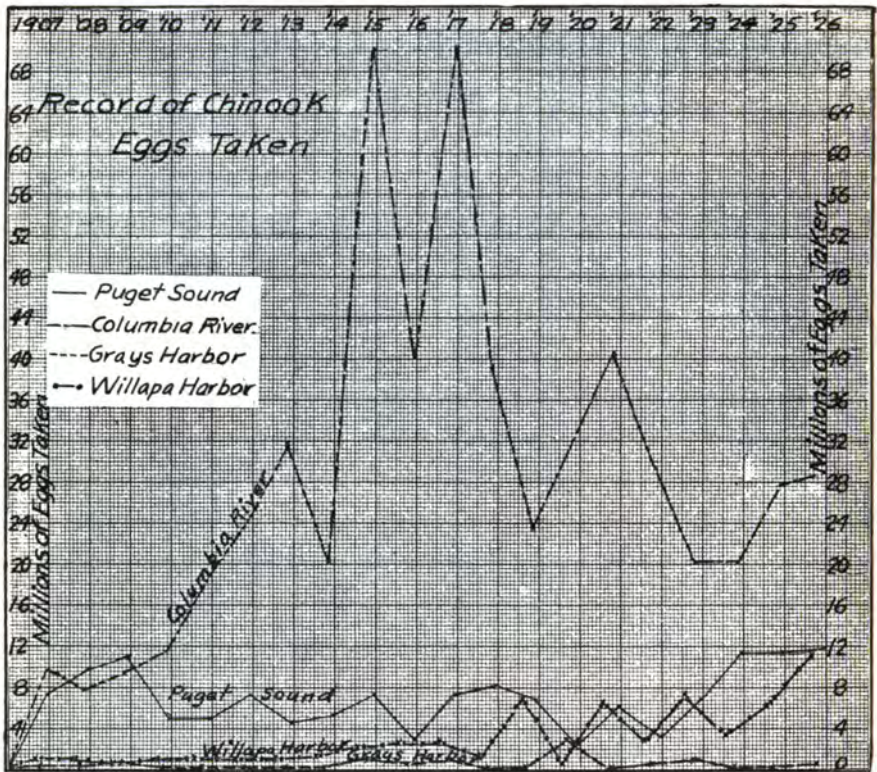
The peak years are the result of the combined takes of Kalama and Wind River. Wind River Hatchery was eventually closed due to excessive seining near by which practically depleted the egg supply.

STEELHEAD MADE GAME FISH BY STATE LEGISLATURE.

The extraordinary legislative session of 1925 in chapter 178, section 4, classified steelhead, (*Salmo gairdneri*) as a game fish above a point established by the director of fisheries as the mouth of any river or stream. In some districts of the state, especially the Columbia River, the steelhead is quite a factor in the commercial fishing. In the Puget Sound area, however, especially after the promulgation of the regulations of the fisheries board since 1921, the commercial value of the steelhead became negligible, due to curtailment of stream fishing in all streams entering Puget Sound, and except for the short winter season allowed in the mouths of the Skagit and Snohomish, further curtailed by the above mentioned section 4, very little fishing for steelheads commercially has been engaged in.

Steelhead eggs have always been taken and hatched in all hatcheries of the state and since 1909 to date the records show that this department hatched a total of considerably over 150,000,000 steelhead trout eggs. This figure does not include any eggs taken since 1921 by hatcheries which were allotted to the Division of Game and Game Fish in that year when the Fisheries Department was divided into two distinct organizations.

This past season salmon hatcheries continued taking steelhead eggs as usual and same are now being allotted by the Division of Game and Game Fish. This division in turn has taken all salmon eggs possible at game fish hatcheries located on streams which salmon frequent in their spawning migrations. I wish to take this opportunity to call to your attention the cheerful and unselfish cooperation shown by Mr. S. F. Rathbun, Supervisor



of the Division of Game and Game Fish, and his subordinates in all of the work where our operations join.

We believe that our hatchery operations including repairs, replacements, and new construction are being conducted very economically. All plans and estimates are developed and made in the department's office and all building work undertaken is under the direct supervision of the general superintendent of hatcheries. A large 2-ton White truck is used in hauling materials, supplies, construction equipment, etc., from one hatchery to another, and the Auburn warehouse, constructed during this biennium, is available for storage of bulky hatchery supplies, concrete mixers, and other construction equipment when not in use. All purchases of hatchery supplies and materials needed in construction are made through the State Supervisor of Purchasing at wholesale rates.

The curtailment of considerable necessary upkeep repairs and replacements, through shortage of funds, in the previous administration, threw a considerable extra burden upon our operating expense the past two years. However, when reviewing the work accomplished, with the necessary re-organization and building up of our field forces, we feel that hatchery

stations, equipment and personnel are now in a position to accomplish even better results during the next biennium.

WASHINGTON'S OYSTER INDUSTRY.

For over a year the department has employed, at full time, a superintendent on the state oyster reserves in the Puget Sound District in place of local watchmen, who were not paid sufficiently to give the work any particular attention, except as concerned one reserve. It would seem that this plan, although it has its limitations, is more successful. Considerable sale of oyster seed is made every year to operators of private beds. The total received from sales of oyster seed for the years 1921-1924 inclusive in the Puget Sound District was \$16,835.87, an average of \$4,208.97 per year. In 1925 the sales were \$7,241.17, in 1926, \$5,323.07 and at this writing the returns show that 1927 will probably exceed \$5,000.00.

The oyster industry of the state of Washington, centering in the upper Puget Sound area near Olympia and in the southerly waters of Willapa Harbor, has experienced many ups and downs. The operations in Puget Sound are decidedly on the up-grade, and seemingly on a firm basis, according to the following values reported on oysters marketed: 1921, \$212,979.00; 1922, \$276,660.00; 1923, \$326,405.58; 1924, \$339,484.80; 1925, \$363,696.50; and 1926, \$379,682.25. In the Willapa Harbor oyster area the yearly sales of oysters reported are: 1921, \$21,217.30; 1922, \$36,539.19; 1923, \$42,599.69; 1924, \$41,010.21; 1925, \$12,087.25; and 1926, \$30,470.75.

In Puget Sound an especial effort has been made to shuck oysters on the beds or in nearby shucking plants so as to return all shells to the beds for cultch. The shipping of oysters in the shell and failing to return the shells to the beds has been one cause of depletion. It is hoped that a remedy may be found to reestablish, in part at least, the conditions of the Willapa Harbor beds, where the most serious depletion has occurred.

STUDIES OF WASHINGTON OYSTERS AND TRANSPLANTS.

Professor Trevor Kincaid, of the Biology Department of the University of Washington, has for several years been studying the oyster resources of Washington, and following this report will be found some brief observations which he has prepared on these studies. His complete report on his research work on Washington oysters is about ready for publication, and should be published by this department.

TRADE WASTE INVESTIGATIONS.

At the annual meeting of the Olympia Oyster Growers' Association, held in Olympia, July 19, 1926, the attention of the Association was called to the necessity of protecting the fish and shellfish in the waters of the state from deleterious industrial wastes.

With the advent of pulp and paper mills in Washington, it was pointed out that scientific investigations, as well as changes in statutes, were needed in order to check such pollution from the start.

In session August 30, 1926, the State Fisheries Board met with representatives of the Oyster Growers' Association of Pacific Fisheries, the State Health Department and the College of Fisheries, for considering ways and



View Showing a State Oyster Reserve, Puget Sound.



Gathering Oysters for Sale From a State Oyster Reserve Seed Bed.



Oyster Seed Buyers' Scows Loaded and Waiting for High Tide to Tow Away to Private Beds.

means to properly investigate the situation concerning the deleterious effects of trade wastes. Preliminary investigations of plants already established were ordered made and the preliminary work of getting samples and determining water contents from these plants was carried out by Mr. D. R. Crawford of the College of Fisheries and the results reported to the State Department of Health, Mr. H. W. Nightingale, State Sanitary Engineer, who continued more detailed investigations during the fall of 1926, assisted by Mr. Frank R. Shaw, Associate Sanitary Engineer of the United States Public Health Service, in considerable of the field work.

The first investigation concerning pulp mill wastes, was completed about the middle of January, 1927, and was reported upon at a meeting in the Chamber of Commerce, Olympia, January 21, 1927. This meeting was attended by legislators, oyster growers and representatives of the fisheries interests, and a brief report of this first investigation, by Mr. Nightingale, appears in this issue.

THE CLAM INDUSTRY OF WASHINGTON.

Pacific Ocean Beaches.

The canning of razor clams (*Siliqua patula*) on the Pacific Ocean beaches of this state has developed into a well established seasonal industry, employing considerable transient labor besides local diggers, during the months when commercial clam digging is permitted by the state laws, namely, March, April and May. Advertising and the taste developed for this product have resulted in apparent over-fishing at times, not to mention inroads made in the parent stock by the persistent out of season clam digging by tourists and local residents and the apparent wastage attendant thereto, due to the fact that the present law contains no restrictions on what a person may dig for his own use.

Legislative attempts to limit the daily amount of clams one may take for personal use, as well as the minimum size permitted for commercial use, have so far failed of passage, but some such regulatory measures must be secured or this valuable industry in its present magnitude is liable to be seriously reduced.

Studies of the life-history and growth of the razor clams on the Pacific Ocean beaches have been conducted by Mr. Harvey C. McMillin since 1923, and in another part of this report appears a brief memorandum of his observations brought up to and including the clam season just closing, May 31, 1927. Data concerning the packs of the past two years will be found in the statistics for 1925 and 1926 which close this report.

Puget Sound Clams.

Although the canning of clams in the Puget Sound area does not compare in magnitude with that of the Pacific Ocean beaches, a considerably larger tonnage of clams is marketed fresh each year. The yearly season extends from September 1 each year to March 31 of the following year; several varieties of clams are obtainable, and the clam beds over the Puget Sound area are quite extensive. Up to the summer of 1925 no very special study of the clam beds of Puget Sound had ever been made and a comprehensive study would necessarily cover a considerable period of time and require the services of several investigators; however, during the vacation season of 1925, Mr. H. W. Nightingale, then an instructor in the

College of Fisheries of the University of Washington, made a launch trip covering hurriedly the better known clam areas of the Sound, and his report is contained in another section of this report.

BIOLOGICAL STUDIES AND INVESTIGATIONS.

The biological elements which pertain to the life history, habits, growth and supply of the fish and shell fish with which this department has to deal require a considerable scientific and semi-scientific knowledge of conditions which augment or deplete the marine life of the state. Some very valuable reports have been made. One which deserves mention is "The Taking of Immature Salmon in the Waters of the State of Washington" by E. Victor Smith of the University of Washington. Mention has already been made of studies by Professor Kincaid, Mr. McMillin and others. Brief mention was made in the last two biennial reports of some investigations in progress under the direction of the College of Fisheries. Except for the limited survey of Puget Sound clam beds made in the summer of 1925, reported in another part of this biennial, the following is the only additional memoranda brought to my attention:

REPORT ON STREAM INVESTIGATION.

D. R. Crawford, Sept. 25, 1925

The outstanding feature of this summer's work has been the investigation of the Cowlitz water shed. Young Chinook salmon were found in abundance in the Cowlitz river and its upper tributaries in August. Examination of the tributaries showed that the spawning grounds cover large areas, thus indicating that future development of the summer run of Chinook salmon may proceed on a larger scale. Good roads make all possible hatchery sites in the Cowlitz Valley easily accessible by automobile. Undoubtedly, development of the summer run in the Cowlitz will contribute greatly to the supply of early Chinook salmon in the Columbia river.

Other rivers investigated include the Nooksack, Skagit and Stillaguamish. These rivers and their tributaries contain very extensive spawning grounds for all species of salmon except the sockeye, this salmon spawning only in Baker Lake. Swarms of young Silver and young Chinook salmon, have been seen in all the rivers mentioned. These little fish make up the future supply of salmon in Puget Sound and constant vigilance is necessary to protect them.

A very good run of large humpbacks in the Skagit is taking place now and mature fish have been found in the streams above Marblemount. This is rather an unusual distance from salt water for humpbacks to run. Young coho or silver salmon and steelheads were abundant in the Stillaguamish river, and no great extension of intensive fishing off the mouths of these rivers should be permitted.

The following is a condensed memorandum on general scientific investigations of the North Pacific:

INTERNATIONAL PACIFIC SALMON INVESTIGATION FEDERATION.

One of the outstanding developments in fisheries conservation work during the past biennium was the movement started early in 1925 when the fisheries officials of Canada and the United States met in joint session with those of Alaska, California, Oregon and Washington and formed the "International Pacific Salmon Investigation Federation," their first meeting being held in Seattle with the State Fisheries Board of Washington on March 16 and 17, 1925.

The second meeting of this body was held in the office of the U. S. Bureau of Fisheries, L. C. Smith Building, Seattle, on November 24, 1925,

with Hon. Henry O'Malley, United States Commissioner of Fisheries, presiding. Reports from all districts were made on tagging experiments and other salmon investigations conducted during the summer of 1925, undertaken through the preliminary plans formulated and discussed at the previous session in March, as set out in detail in the last biennial report, (pages 6, 7 and 8). Space does not permit of the detailing of the various discussions and reports, but the apparent results of starting this cooperative effort of all Pacific Coast fisheries officials with the national fisheries officials of both Canada and the United States show that work of this character is greatly needed and in the right direction.

On December 2, 1926, the third meeting of the Federation took place in Seattle at the office of the United States Bureau of Fisheries, Mr. O'Malley again presided and each state, as well as Canada, British Columbia and Alaska were all represented. The chairman of the program committee, Dr. Rich, presented an outline based on suggestions made at the previous meetings, as well as the field work experiences of those present, and a full discussion of the various points set out below, followed. The meeting adjourned, subject to the call of the chairman, and it was suggested that the various subcommittees continue their study of various phases of the work outlined and be prepared to make reports whenever another meeting might be called.

**REPORT OF THE SUBCOMMITTEE ON PROGRAM OF THE EXECUTIVE
COMMITTEE INTERNATIONAL PACIFIC SALMON INVESTIGATION
FEDERATION.**

Dr. Willis H. Rich, Director of U. S. Bureau of Fisheries Laboratory,
Seattle

The subcommittee wishes first to express its belief that the primary purpose of any program of research should be to produce the essential knowledge needed for the proper and scientific administration of the salmon fisheries. Our desire is to effectively conserve the great salmon resources of the North Pacific, and our conception of such conservation involves the utilization of the resources to the fullest extent compatible with their perpetuation. We would like to be able to say definitely how many salmon it would be possible to take from a given region and still leave sufficient for spawning purposes so that the supply will continue year after year at a high level. It has been repeatedly brought out at both of the previous meetings of this committee that the central idea about which we should build our program is the production of the maximum yield obtainable from this fishery, and by the maximum yield is meant the greatest production of fish which may be taken for commercial purposes without affecting the future supply. To provide adequately for this we must know: (1) what natural fluctuations in the abundance of salmon occur; (2) the causes of these fluctuations, particularly the immediate causes though the ultimate causes should finally be known; (3) the intensity with which the commercial fishery is conducted and its effect on the future supply; and (4) the relative value of various measures which may be used to prevent depletion and to build up runs already depleted. With these fundamental requirements in mind the following program is presented:

1. Collection of adequate and uniform statistics.
2. Tagging experiments.
3. Scale analysis of the adult runs.
4. Study of the adult returns from known escapements to the spawning grounds.
5. Stream surveys of the spawning grounds.
6. Study of the production of seaward migrants from known escapements of parent fish.

7. Efficiency of various methods of artificial propagation as compared with natural propagation.
8. Effect of transplantation.
9. Improvement of spawning areas and overcoming of obstacles, natural and artificial, to the ascent of spawning salmon and to the descent of the seaward migrants.
10. The life history in fresh water with particular attention to the factors affecting survival during this period of the salmon's life.
11. Life history in the ocean.
12. Study of the effect of sea fishing.

This state with Oregon and California, following the suggestion of Dr. C. H. Gilbert, jointly leased a purse seine boat and net, and employed a crew to conduct salmon tagging operations along the coast from Cape Flattery to Monterey. Although an expensive undertaking, no results were obtained worth reporting, except that it is very doubtful if wholesale tagging, even under most favorable conditions, would be productive of very valuable information, unless perhaps some data on the percentage of immature salmon taken by this method.

During the summer of 1926, the three states mentioned above did some off-shore tagging individually and as reported in the meeting of December 2, 1926.

Studies and investigations of more or less importance are constantly under way by men in the department covering not only the salmon, but many of the other less valuable and less known fishes abounding in waters of the state of Washington, and the department is fortunate in having, as assistant superintendent of hatcheries, Mr. Arthur S. Einarsen, who besides being a science graduate of the University of Washington, has had a considerable experience in practical fishing both in Alaska and Puget Sound waters, and he has summarized briefly a memorandum on investigations conducted during the 1925-1926 biennium for this report which reads as follows:

INVESTIGATIONS CONDUCTED DURING THE 1925-1926 BIENNIUM.

The State Fisheries Board and the State Supervisor of Fisheries were very active during this period in searching out facts relative to our less known fishery resources and studies were made of such fisheries as the Columbia River smelt (*Thaleichthys pacificus*), Puget Sound smelt (*Hypomesus pretiosus*), the Dungeness or edible crab (*Cancer magister*), the various representatives of the flat fishes (*Pleuronectidae*) such as the flounders, sole and plaice, and considerable attention was given also to the herring native to this district (*Clupea pallasii*).

The investigations were conducted with one chief purpose in view; namely, the establishment of real conservation policies. Incidentally, a wealth of useful knowledge was gained and resulted in changes which may be listed as follows:

1. The shortening of the weekly fishing season for Columbia River smelt and restricting the fishing area which tend toward (a) the establishment of a better working condition for fishermen and shippers, (b) give the smelt a better opportunity to perpetuate themselves, (c) provide for a better grade of fish reaching the market by eliminating spawners in poor condition.

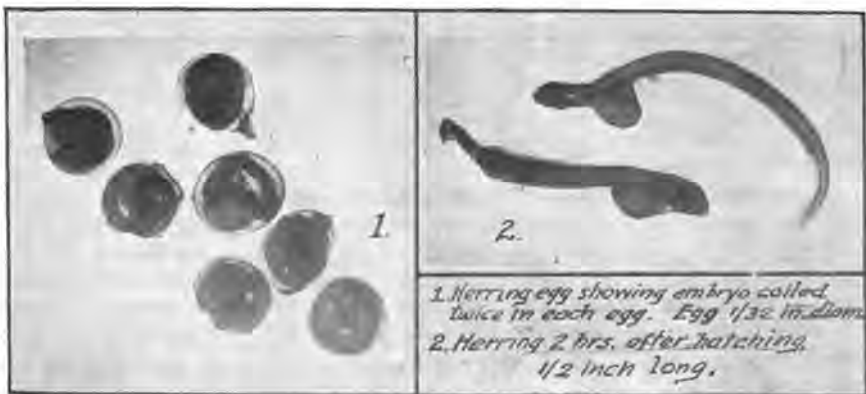
2. The establishment of a shorter weekly season on Puget Sound smelt and the placing of an individual fishing for sport for his own use, on an

equal basis with a commercial fisherman; that is, the same seasons must be observed which tends toward (a) greater period of protection to the spawning smelt, (b) and makes this protection effective by denying everyone the privilege of fishing during the closed season. Whereas, formerly sport fishermen had fished the beaches indiscriminately during the weekly closed season and wantonly undid any benefits that might have accrued, by taking the spawning fish or tramping their spawn into the beach sand.

3. An amendment to the previous regulations for the protection of the crab, was made by the 1927 session of the legislature, which gives crabs greater protection by (a) permitting only the taking of male crabs of at least 6¼ inches across the back immediately in front of the points, (b) and limits the number of crabs that an individual (not a commercial fisherman) may take in any one day for personal use, thereby limiting the wastage that so often occurs when the opportunity to take an unreasonable number of crabs presents itself even though no proper outlet for their disposal is apparent.

4. Establishment of new orders regulating the taking of bottom fish by closing certain spawning areas indefinitely, closing other areas to commercial gear but allowing individual sport fishermen to enjoy these areas unmolested, by closing certain areas seasonally and by regulating the size of mesh used to take the bottom fishes. These regulations tend toward bottom fish protection since (a) spawning fish are allowed to go unmolested, (b) the limiting of the mesh halts the destruction of immature fish, (c) the seasonal closed areas give an impetus to prospecting new grounds, thereby discouraging overfishing of one area, (d) the open season on the most frequented fishing banks is chosen to fall at a time when outside flat fish such as the halibut from off shore and Alaska is not in such direct competition, since halibut fishing closes November 15th, each year, and continues closed till February 15th of the next year. This has done more to stabilize a weak market than any amount of advertising.

5. The creation of new orders regulating the taking of herring by dividing the Puget Sound District into two areas, each area being fished alternate years. This should be a good step toward conservation since it



Herring Eggs and Fry (from Incomplete Report on Puget Sound Herring Fishery).

would be impossible to over-fish an area and, should it be found to be unnecessary after being in effect for a time, it can readily be changed, although for the present it looks to be a particularly wise move to conserve a natural resource until a time arrives when its value is more appreciated.

Further investigations are under way and a continual vigilance is exercised in the fishing field with the idea of sane conservation in mind. The rights of individuals are always safeguarded, the state demanding no licenses for sport fishing or fishing for one's own use with certain types of gear and allowing continuous fishing all the year around, except in a few cases when it has been found necessary to compel everyone to observe closed periods to prevent annihilation of runs. It will be observed that all closed periods open either on Saturday or Sunday. This has been arranged so that people whose only leisure comes over the week-end will not be deprived of the opportunity to fish.

Fishermen as a class are prone to anticipate disastrous effects of any new regulations. The following excerpt from a smelt fisherman's letter at the issuance of a new Board Order in 1926 prior to the opening of the season, is interesting:

"* * * The latest ruling of the Board of Fisheries is going to put us smelt fishermen in this district completely out of business. We cannot make a living * * *, etc."

There is seldom a case where the fishermen will wait for effects or study the regulations over a season. In following through the complaint above, we find that the take of smelt in his district in 1925 was 80,359 pounds. In 1926, the year of the new regulation, the district's take was 167,613 pounds or an increase of 87,254 or more than 100% with a longer weekly closed season, thereby insuring future runs by permitting the smelt to reach the beaches to spawn.

The records of the complainant are likewise very enlightening.

During 1925 he took 7,815 pounds of smelt.

During 1926 he took 10,969 pounds of smelt.

It might be mentioned that his first complaint has not been repeated.

Among the numerous surveys and investigations carried on by the department during the biennium, we find the following:

1. A report on the Pend Oreille river and Z Canyon.
2. Introducing work on the life and habits of the Columbia river smelt (*Thaleichthys pacificus*).
3. Investigation of the hair seal herds as a menace to the salmon industry.
4. A study of salmon runs on Grays river, a tributary of the lower Columbia.
5. Numerous studies of reported polluted areas, trade waste effects, and stream obstructions.

In addition to the biological studies mentioned in the foregoing by Mr. Einarsen, the department received several reports on investigations in the Columbia River water shed conducted by Mr. Hugh C. Mitchell, of the United States Bureau of Fisheries, in the employ of the Columbia River Salmon Protective Association. In this work, by the direction of the Fisheries Board, this department furnished Mr. Mitchell an assistant for several weeks, Mr. J. B. Phillips, who graduated from the College of Fisheries in 1926.

The patrol inspection force of our department is under instructions to constantly report on all salmon streams visited, as to conditions of water,

value and extent of spawning beds, as well as conditions and extent of the fishing operations.

POLLUTION PROBLEMS.

The investigations on pollution or possible pollution through industrial wastes have already been mentioned under the section of the report on the oyster industry. It is a satisfaction to report some progress, and that, in the legislative session just completed (March 1927), the department secured an amendment to section 5734 of the Fisheries Code, which requires the submittal of plans and specifications for the disposal of industrial wastes of any new projected plants in the state of Washington to the State Director of Health and the Supervisor of Fisheries for approval before such plants may be constructed. The amended section 5734 is given below.

Sec. 85. Polluting Waters Prohibited.

It shall be unlawful to cast or pass, to suffer or permit to be cast or passed into any waters of this state, either fresh or salt, any sawdust, planer shavings, wood pulp or other waste, lime, gas, oil, oil products, grease, coculus (cocculuc) indicus, or any chemical substance, except coal mine waste or drainage, in quantities sufficient in the judgment of the state fisheries board and the state board of health to injuriously affect, destroy or diminish the growth of the plankton, benthos, or algae or the fish and shellfish inhabiting such waters or impair the supply thereof. It shall also be unlawful to cast or pass, to suffer or permit to be cast or passed into any waters of this state, either fresh or salt, any refuse or waste material, substance or matter at any time whatsoever which may be determined by the state board of fisheries to be deleterious to fish or shellfish. The state board of health shall co-operate with the state fisheries board in the making of its said determination. The state fisheries board shall have the right to call upon the department of health for such investigation and report as may be necessary from time to time concerning the effect upon aquatic life of various kinds of refuse and waste materials, substances or matters to the end that it may from time to time, as warranted by conditions, promulgate rules and regulations prohibiting the deposit in the waters of the state, either fresh or salt, of such refuse or waste materials, substances or matters as may be deleterious in their effect upon fish and shellfish. The rules and regulations shall be promulgated and published in the manner now or hereafter prescribed for the promulgation and publication of its rules and regulations relating to the taking of food fish and they shall constitute prima facie evidence that the refuse or waste materials, substances, or materials therein declared to be deleterious are in fact deleterious to fish and shellfish inhabiting the waters. In any action or proceeding involving the validity or construction of any such rule or regulation it shall be competent to plead the same by title and number and to prove the same by the introduction of a true and correct copy thereof, duly certified by the secretary of the State Fisheries Board. The Director of Fisheries and Game, through the Supervisor of Fisheries, with the approval of the State Fisheries Board, shall have the power to grant permits for the sawing of logs in such waters as in his judgment can be used for that purpose without injury to fish and shellfish. Before any industrial or manufacturing concern, the construction and operation of whose plant will necessitate the dumping of refuse or waste materials, substances or matters into any waters of this state, either fresh or salt, shall proceed with construction and operation, it shall submit for the approval of the Director of Fisheries and Game, through the Supervisor of Fisheries, and the Director of Health, detailed plans for the disposal of its refuse or waste materials, substances or matters, and if such plans do not in the judgment of the Supervisor of Fisheries and Director of Health make adequate and effective provision for safeguarding fish and shellfish in such waters, the said Supervisor of Fisheries and Director of Health shall disapprove the same and it shall be unlawful for the person, firm or corporation to proceed with the operation of its said plant until the plans are revised in such manner as to meet the objections of the Supervisor of Fisheries and Director of Health. Any person, firm or corporation feeling himself or itself aggrieved by any order or ruling of the Supervisor of Fisheries and the Director of Health disapproving

the detailed plans for disposal of refuse or waste materials, substances or matters submitted by an industrial or manufacturing concern as above provided, shall have the right of appeal from such order or ruling to the superior court of the county in which the plant of such industrial or manufacturing concern is situated, in the manner provided by law for taking appeals from justices' courts, and upon such appeal being taken and perfected, the same shall be set for hearing and heard by the judge of said court, de novo without a jury and at the conclusion of the hearing the judge shall enter an order approving the plans submitted, or modifying and approving such plans, or disapproving the same, as may to the judge seem necessary for the protection of the public health and the fish and shellfish inhabiting the waters of this state. (Sec. 1, Chap. 299, Laws of 1927.)

Old statute prohibited the owner of a sawmill or employe from casting sawdust, etc. Held that any mill that makes sawdust is contemplated by the statute, as the primary object is the protection of fish: *State v. Kroenert*, 13 Wash. 644; *State v. Botchford*, 71 Wash. 114.

In compliance with the provisions of this section, the following skeleton form of rules and regulations prepared by the State Department of Health were read and approved by the State Fisheries Board under date of April 15, 1927:

"All manufacturing and industrial plants proposed for establishment on or adjacent to the waters of the state shall submit plans and specifications to the State Department of Fisheries showing:

"1. The character and quantities of materials used in the manufacturing or industrial processes.

"2. The character and quantities of waste materials arising therefrom which might enter the waters of the state.

"3. If recovery processes, patented or otherwise, are proposed for use in connection with the wastes arising from such plants, a statement regarding the name of the process if it has any, and the character and probable percentage recovery of the wastes should likewise be submitted.

"4. If such plants are operated only during certain seasons of the year, mention should be made thereof."

PROBLEMS IN MAN-MADE MENACES TO FISH LIFE.

1. Irrigation and Reclamation Projects.

The screening of the irrigation ditches is still an unsolved problem, and the destruction of young salmon and trout is enormous, and it seems at this time proper to call attention to the reports that have been made on the subject from time to time in the past, and during the past year, especially as concerns the Yakima River, a tributary of the Columbia.

John L. Riceland, State Fish Commissioner, in a biennial report of 1911 and 1912, page 110, shows a photograph with the following caption:

"Seven hundred salmon fry taken from one lateral irrigation ditch within a distance of 200 feet."

Dennis Winn, Field Superintendent, U. S. Bureau of Fisheries, in an article reporting a visit to the Yakima River ditches and printed in the "Pacific Fisherman" of February 1920, says in part as follows:

Enough was observed to state positively that the loss of food fishes, principally salmon, is appalling. The farmers in the vicinity gather the best of the fish by the washtubful. The same condition is also true of all such drops of which there are several hundred in the different ditches.

The fall season does not represent the most serious losses in regard to the salmon. Through July when they are migrating, it is estimated that from 90 to 97 per cent of the Yakima River passes into the irrigation ditches, through which the down-stream migrating salmon also pass, only to be washed out on some farm where they must of necessity perish. The economic waste is stupendous as many tons of migrating salmon, trout and whitefish are destroyed each year.

The Yakima Valley Fish and Game Protective Association, under date of March 4, 1922, passed a resolution asking for relief and quoted in part as follows:

WHEREAS: The Wapato Irrigation Canal, of the Yakima Indian Service and the Sunnyside Irrigation Canal of the Reclamation Service, both located in the Yakima County, being the largest of their kind in the county, if not in the state of Washington, the former using 15,000 second feet of water and the latter 20,000 second feet of water, and

WHEREAS: Said ditches or canals, operating to capacity for seven months of each year, and during parts of said period, taking fully 90% of the water out of the Yakima River.

WHEREAS: Said ditches or canals, taking said amount of water out of the Yakima River and being protected in no way whatsoever, are taking, during their operating period, a large amount of the food fish as well as the game fish from said Yakima River.

WHEREAS: The Yakima River, with its tributaries, is positively known to be one of the best natural salmon streams in the Pacific Northwest.

WHEREAS: This loss of salmon each year amounts to millions of dollars in food to the people of the states of Washington and Oregon.

Extract from L. E. Mayhall's report dated June 8, 1922:

The destruction of spring Chinook salmon in these two irrigation systems is enormous. As a result of the large percentage of the Yakima River flow being diverted, there is very little opportunity for the small salmon migrating down stream to avoid passing into these canals.

Extract from report made by J. B. Phillips, dated September 11, 1926. Mr. Phillips was working under Hugh C. Mitchell, Field Representative for the Columbia River Salmon Protective Association:

The larger irrigation canals of the Yakima District tend to divert the main current of the river into the canal, they might be called down stream fish traps. The Sunnyside Canal leaves no alternative whatever but for the young fish to go down the canal.

Briefly stating the conditions on the Yakima River where the greatest loss is occurring: The Sunnyside Canal, a Reclamation project and the Wapato Canal, an Indian Service project, are diverting at times, and especially at a time when the young salmon and trout are migrating down stream, practically the entire flow of the Yakima River.

It is inconsistent to screen the privately owned irrigation canals above these projects for the reason that the salmon would be diverted, by these two canals, to the fields to die.

It is also impractical to insist on screens in the canals below these projects for the reason that the young salmon have already been diverted from the river and killed by the Federal owned and operated canals.

The larger responsibility for this waste and loss to the sportsmen, commercial fishermen and the state in general, rests with the Federal Government; on the other hand this department is also at fault, for in the past it should have attempted in some way to bring about corrective measures.

It is one of the dark spots in National Government that one department spends enormous sums of money to build up a natural resource, in this instance the propagation and protection of fish life, while another department of the Federal Government, through its activities in another field just as important economically, unnecessarily destroys fish life by the millions.

2. Construction of Power and Storage Dams.

The building of any dam in a stream, whatever the height of same, at once changes the natural conditions of the stream, and as a general thing,

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dries up spawning beds below a canyon where the dam is usually built, and likewise above the dam covers up by flooding the spawning beds above the dam site.

Salmon or trout in their natural upstream movement, for the purpose of spawning on beds farther upstream than the dam location, and, stopped when green or unready to spawn, must be taken over the obstruction or their economic value for reproducing the species is lost. Salmon of the early runs, in some instances travel hundreds of miles upstream before they are ready to spawn. Detention by impounding in limited spaces has not proven satisfactory for reproduction purposes, as is witnessed by the memorandum on the Elwha Hatchery in the last biennial report.

The North Fork of the Skokomish River which enters Puget Sound at the head of Hoods Canal, is also a good example of the destruction of spawning beds. In this case the power and storage dam for the city of Tacoma, Lake Cushman Project, is more than 200 ft. high. It has no fish ladder. The storage is large and the generating installation is greater than the water flow and is operated in a hook-up with other power plants. During periods of the day when demand for power is low this plant is shut down and the water is conserved which leaves the river dry for miles below the power house. As the entire water flow is conserved, there is no overflow to enable the young migrating fish to pass down over the dam or to furnish water for the constant operation of a fishway. Besides the above mechanical difficulties the owners of the power development secured a supreme court decision reversing the decision of the lower court, to the effect that the power is of more importance to society than the salmon. Thus we see a very important salmon stream going down before the advance of commercial development.

It is hoped, in this instance, to eventually secure aid under the provisions of section 6, chapter 90, Laws of 1923, which provides for the erection of a hatchery where a fishway is impracticable. The mouth of the North Fork of the Skokomish may possibly be racked in such a manner as to direct the upstream migrants into the other forks of this stream, but a practical hatchery location with ample water supply enters into the problem, and so far owners of the only location, seemingly feasible for hatchery operations, did not receive the advances of a representative of the department very cordially.

Mention was made in the last biennial report concerning the proposed power project at Priest Rapids on the Columbia River, wherein the Federal Power Commission granted a permit without, seemingly, any special consideration of the reports of a hearing held by Col. W. J. Barden of the United States Engineers in January, 1924, and the brief submitted by representatives of the fisheries interests, the United States Bureau of Fisheries and the Fisheries Department of Oregon and Washington, entitled, "Save the Columbia River Salmon."

Article 18, of the Federal license, or permit to the Washington Irrigation and Development Company reads as follows:

Article 18. The Licensee shall, without cost to the United States, construct, in connection with said dam, a *fishway, fish hatchery, or such other structure or structures as may be determined by the Secretary of Commerce* and in accordance with *plans which shall be prescribed or approved by said Secretary: Provided, that the financial responsibility herein imposed on the Licensee for the construction of*

such structure or structures shall not exceed an aggregate of three hundred thousand dollars (\$300,000).

Early in 1926 the proposed site of the Priest Rapids dam was visited by a committee composed of representatives of the United States Bureau of Fisheries, Oregon and Washington Fisheries Departments and the Priest Rapids power permit holders' engineer. Tentative plans of the proposed development were shown to the committee and the area where the proposed dam is to be built was looked over.

It would seem from the magnitude of this proposed development that construction would cover a period of from four to six years and in turn menace the runs of salmon over the corresponding number of cycle periods. The great fluctuation in water levels at varying periods of the year adds another matter for serious consideration.

From the standpoint of the fishing industry this immense construction project, if and when it is consummated, will seriously deplete the salmon run in the Columbia River, which goes above the Priest Rapids to spawn, even though some fishway may be developed that will pass fish over this proposed obstruction. Whatever plan is made must not only handle the upstream and downstream migrations after completion, but must provide each year an unobstructed passage of each year's run of salmon during construction.

Out of the hearings on the Priest Rapids fishway problem in 1924, came the formation of a general committee on fishways formed by fisheries and power interests.

At the session of the committee in May, 1924, an executive committee was chosen to have immediate charge of the work for the general committee, consisting of J. E. Yates of Portland and W. D. Shannon of Seattle, representing the hydro-electric interests, and Professor John N. Cobb, and on June 12th this committee directed that the research work undertaken should be under the direct supervision of Professor Cobb.

Funds to the amount of \$5,000.00 were provided on the following basis: one-fourth each from the Oregon and Washington Departments of Fisheries and one-half by the power interests.

The permit for the Baker River Power dam near Concrete was granted by the State Hydraulics Department during the previous administration, (1921-1924) and in the late spring of 1925 construction was well under way. Upon investigation it was learned that at the time the permit was up for consideration, protests had been filed by both the Federal Bureau of Fisheries and the State Department of Fisheries, but upon a promise to comply with certain conditions, set out in a letter from the U. S. Bureau to the State Department of Hydraulics, permit was granted. It could not be found, however, where any mention of these conditions had been stipulated in the granted permit.

With the Baker River dam fifty per cent completed in 1925 and the practical destruction of the sockeye run for that year in sight, this department proceeded as best it could under the above mentioned permit conditions. Investigations of the dam under construction and a survey of proposed fishway plans of the project engineers by the representatives of this department, were made. Tentative changes and concessions were agreed upon by both interests, and tentative plans developed for a fishway

in the limited area permitted along side of the power house site, a considerable distance below the dam.

The chairman of the State Fisheries Board then called a meeting of the fishway executive committee previously mentioned for a report on their investigations during the preceding year. It was found that experiments costing a considerable sum had been made with hoists, but that no particularly pertinent knowledge had been gained except that it would first be necessary to corral the fish to operate a hoisting device with any degree of success.

In view of the necessity of immediate action on the Baker River project, the tentative plans prepared by the Stone & Webster engineers, including certain requirements asked by this department, were presented to the committee, and under the circumstances approved as being probably the most feasible in this emergency.

With minor changes and adjustments, made necessary to fit conditions which arose as construction developed, the fishway was built, but too late to save the sockeye run of 1925 to Baker Lake. When completed the fishway consisted of pools 6 feet by 10 feet with a rise of 2 feet from pool to pool to an elevation of 42 feet. Next came 700 feet of flume that reached to an upper pool at which point a submerged tank car was so arranged that the salmon entered it voluntarily. The car was hauled up an inclined track by an electric hoist to the crest of the dam, where the salmon were dumped into a receiving tank and passed through a flume to the water above the dam. Of the 1926 sockeye run 3,500 fish were put over the dam with a loss of 25%. Of the silver salmon run 8,219 fish were put over, and 175 Chinook salmon.

An arrangement at the entrance to each pool, required by this department, which would not obstruct salmon from entering the fishway or from passing up from one pool to the other, but which would prevent fish from retreating down the fishway or out of it once they had entered, was installed, but we failed to get an arrangement of an adjustable gate at the foot of the fishway properly provided to cause a waterfall to attract fish, no matter what the stage of water. These two items, it is believed, are most important items in fishways of any considerable height.

The results obtained in 1926 although not sufficient to warrant the department giving the Baker River fishway complete approval, contained considerable promise of better results this present season (1927).

Downstream migrants during the 1926 season were passed through the spillways with very little apparent loss, as observed by representatives of this department and the U. S. Bureau of Fisheries.

During the recent freshets considerable movement of debris in the canyon below the dam and above the power house has moved or been washed downstream, which constantly changes stream bed conditions and to prevent upstream migrants going past the entrance to the fishway a permanent rack is now being constructed, to divert these upstream spawning salmon to the entrance of the fish ladder.

At the close of this biennium (1925-1926), the 700 feet of flume and incline hoist are being dispensed with this season. A standing cable is being used which reaches from a tower on the crest of the dam to the upper end of the fishway which is about 700 feet distant. A travelling tank is swung on this standing cable which is operated by an electric

hoist. The fish enter the tank as before mentioned at the head of the ladder and are disposed of on the crest of the dam as before. The destructive action of the freshet water passing over the dam, the rock slides down the walls of the canyon and the ice forming from the spray of the dam made successful operation and maintenance of the flume and incline hoist impossible in this 700 feet of canyon.

With the transferring of the responsibility on this operation from the construction company to the power plant operating company, it is hoped that further progress will result, and that any new developments, requiring radical changes, will have very serious consideration before being put into operation, and such matters should of course be submitted to this department as they were during the construction period.

The safeguarding of the salmon spawning streams is most important, and as far as the provisions of the Fisheries Code permit, the department will attempt to see that proper safeguards for unrestricted migration are provided.

The laws under which applications for water diversions, or the erection of obstructions of any nature in streams, are made should of necessity require first consideration for the protection of all fish life contained therein.

Several new power projects have been mentioned in press dispatches during the past year and nearly every one requires the building of dams in many of our best salmon streams. The department does not desire to unnecessarily obstruct state development, but suggests cooperation of all interests involved in solving these problems so that all may live and prosper.

EDUCATIONAL.

At several of the meetings of the Fisheries Board, and in conversation with those intimately connected with this state's fishery in its many ramifications, the information was brought to light that the people of the state generally know but very little concerning the value and extent of the fisheries and the work which the Division of Fisheries is constantly undertaking to perpetuate and, if possible, increase the value of this most important food resource of Washington.

During the biennium at various times talks have been given to school children and chambers of commerce, bearing especially upon the need of protecting the salmon on the spawning beds, discouraging gaffing, shooting and snagging; also calling attention to the value of one pair of salmon to the state if allowed to complete their natural functions. It was found that talks, no matter how well delivered, were not productive of results unless accompanied by pictures or models to bring home the points desired and at the direction of the Fisheries Board a little case showing the development of the young salmon fry from the egg through about a dozen stages was prepared. This actual partial life-history told the story quickly and brought home the need of conservation at once, and at this writing permission has been received from the Director of Fisheries and Game to have a large number of these cases prepared next year for the schools and with the cases will be included brief, pertinent facts and general information pertaining to Washington's fishery.

During the summers of 1925 and 1926 this department was afforded the opportunity to participate with exhibits at the annual Sportsmen's shows

which were conducted at the Green Lake playfield. Each year arrangements were made for refrigeration, and displays of frozen food fish were put on display. Besides the several types of salmon, specimens of other lesser known food and shell fish were exhibited, together with fishing gear and an exhibit of the day to day growth of the salmon egg from the time it is taken into the hatchery until it becomes a free swimming fry and ready for the rearing pond. Each year little folders were prepared by this office to distribute telling of the fishing industry and the work in which this office is engaged, through funds furnished entirely by the fishing industry in the nature of license fees and taxes on fish caught.

FISHERIES PATROL SERVICE.

The work of the Division of Fisheries has two main lines of endeavor, propagation and protection. The protection, or patrol service, consists of the apprehension and arrest of poachers, fishermen operating without licenses and in areas closed to fishing, and the inspection of gear and equipment used in fishing for taking various classes of fish. In addition to these activities, which require the necessary moving of our small force of inspectors from one part of the state to another, depending upon local fishing conditions, we have required a constant check on fish movements not only in salt water but in the streams. Reports are required on local stream conditions, flood and low water stages, obstructions, spawning beds, weather conditions, etc., which all have a more or less controlling influence in the maintaining of the salmon cycles.

The use of both floating and road equipment is absolutely necessary and the care and upkeep of patrol boats require considerable attention. A new patrol boat, the "Governor John R. Rogers," was built in the summer of 1926 for use in the lower Columbia River and the cabin of the older Columbia River patrol launch, "Governor John H. McGraw," was rebuilt and a new engine installed. Appropriations were allowed at the last session of the legislature for the installation of a new Diesel engine in the Puget Sound patrol boat, "Governor Elisha P. Ferry," as well as appropriations for new and faster small launches for Puget Sound, Grays and Willapa Harbor. At this writing, however, these boats have not as yet been secured.

Permission was received to have one of our fisheries inspectors act as Chief of Patrol, which centers responsibility in this section of our work, and the results shown in added arrests and total fines during 1925 especially and the greater respect shown for the fisheries laws and the Board's regulations, generally speaking, lead us to believe that as far as humanly possible the inspection force have carried out their duties impartially and with more lasting results.

It might be said, however, that clarifying and amending some of the conflicting statutes would in a large measure assist in making out more convincing complaints for offenders and secure more convictions.

DEPARTMENTAL EXPENDITURES FROM THE FISHERIES FUND.

Considering the status of the finances of this department, I believe I am safe in saying that the Division of Fisheries is on a sounder financial basis at this time than at any other period in the history of the department. The cash balance in the Fisheries Fund as of March 31, 1927, reported by the State Treasurer showed \$212,509.90 and the Oyster Fund, a net total

of \$7,665.09, and at the start of this past biennium the cash balances as of April 10, 1925, gave the Fisheries Fund \$157,989.30 and the Oyster Fund \$3,695.17.

Section 5700 of Remington's Compiled Statutes directs as follows:

The Director of Fisheries and Game is directed to expend such funds, as nearly as may be, in the localities from which they are collected.

and early in July, 1925, a request came from Olympia for a recheck of the receipts and expenditures for the past administration to determine how much of the monies collected in each district had been expended therein. The actual collections handled through this office showed at that time a total of \$715,622.27* and in a report of the expenditures of this department during the past administration (1921-1924) made at your request, on August 1, 1925, a complete detailed statement of my investigations and distributions of the expenditures was made and it was shown that \$415,959.96 was collected in licenses and taxes from the fishermen and dealers in the Puget Sound District; from the Columbia River District, \$232,868.93; from the Grays Harbor District, \$44,188.27; and from the Willapa Harbor District, \$22,605.11; the percentages of collections being, Puget Sound .5812 per cent, Columbia River .3254 per cent, Grays Harbor .0618 per cent and Willapa Harbor .0316 per cent.

The appropriation for the biennium ending March 31, 1923, was \$285,285.00 and there was expended \$259,964.85, leaving an unexpended balance of the appropriation of \$25,320.15. For the biennium ending March 31, 1925, the appropriation was \$292,305.00 and there was expended during the biennium \$268,475.00, leaving an unexpended balance of \$23,830.00, the total appropriations for the four years being \$577,590.00, the total expended, \$528,439.85 and the total unexpended appropriation amounting to \$49,150.15. According to the percentages of the collections the appropriations should have been expended as follows: Puget Sound \$335,695.31, Columbia River \$187,947.79, Grays Harbor \$35,695.06, Willapa Harbor \$18,251.84, total \$577,590.00. As no accurate record had been kept during the past administration of the district expenditures, it was necessary in making the recheck to distribute all expenditures which did not definitely designate in what district the expenditures were made on a basis of the collection percentages and this recheck showed that the Puget Sound District actually received in expenditures from the Fisheries Fund \$324,758.09, the Columbia River District, \$121,748.58, the Grays Harbor District, \$43,669.34 and the Willapa Harbor District, \$38,263.84, the percentages being Puget Sound .6146, an excess of .0334 per cent in actual expenditures over the collection percentage; Columbia River .2304 per cent or .095 per cent under; Grays Harbor .0825 per cent or .0207 per cent over; and Willapa Harbor .0725 per cent or .0409 per cent over the collection percentages. The expenditures of the Collection Department under the supervision of the State Treasurer were not tabulated in the above.

*Later compilation of the total collections for the 1921-1924 period shows a total of \$717,892.37 which would change the district percentages to the following: Puget Sound .5793 per cent, Columbia River .3290 per cent, Grays Harbor .0607 per cent, Willapa Harbor .0310 per cent. This difference is probably chargeable to receipts of the State Treasurer direct in 1921 for fines not reported to this office.

The total appropriations for the 1925-1926 biennium were \$465,000.00 and as compared with the total appropriations of the previous biennium of \$304,805.00 show an increase of \$160,195.00. The appropriations for this past biennium, however, included therein for new hatchery buildings, repairs and replacements, additional patrol service and estimates for additional expense in operating new hatcheries a total of \$185,090.00, which, when deducted from the total appropriations of \$465,000.00, would leave a balance of \$279,910.00 for regular operating expenses, which shows a reduction under the 1923 and 1924 biennium of \$23,895.00.

During the past biennium the actual expenditures from the Fisheries Fund for operations, capital outlays, repairs and maintenance of hatcheries, patrol, biological and sundry expense, destruction of seals, etc., show a total of \$353,621.64 and adding the 1925-1926 biennial expenditures of the Fisheries Board amounting to \$4,269.92, we have a total of \$357,891.56, leaving an unexpended balance of \$107,108.44 of the appropriation for the years 1925 and 1926. Due to conditions which made it impracticable to carry out some of the construction plans for new hatcheries, approximately \$40,000.00 of this appropriation was requested as a reappropriation for the next biennium. The actual district expenditures for the four districts of the above total of \$353,621.64 are as follows:

	1925		1926	
	Percentages	Expenditures*	Percentages	Expenditures*
Puget Sound .....	.6004	\$85,990 35	.4344	\$91,411 37
Columbia River .....	.2411	34,529 66	.3737	73,631 96
Grays Harbor .....	.0847	12,123 08	.0906	19,047 80
Willapa Harbor .....	.0739	10,568 66	.1014	21,315 76

*Note: The above figures are net expenditures, and do not include a \$2,000.00 revolving fund for 1925 and a \$2,000.00 revolving fund for 1926 charged to the office and also a \$2,000.00 revolving fund for 1926 used for a short period for Alaska operations.

The total collections on license fees and taxes on fish caught and other miscellaneous items including reciprocal taxes received from the State of Oregon for the years 1925 and 1926, as well as monies sent direct to the State Treasurer for fines, the sale of state property and miscellaneous items, are shown in the following, together with the percentages for the various districts of the total receipts:

	1925		1926	
	Percentages	Collections	Percentages	Collections
Puget Sound .....	.5709	\$145,556 45	.4830	\$98,706 64
Columbia River .....	.3559	90,755 66	.4126	84,164 47
Grays Harbor .....	.0330	8,407 73	.0473	9,643 99
Willapa Harbor .....	.0402	10,252 22	.0562	11,459 36

During the biennium just closed it seemed advisable to make some adjustments and increases in salaries, especially in the hatchery department. It was found that many superintendents were receiving the same compen-

sation as their helpers, and this was changed by giving every superintendent at least a slight advance over helpers' wages and the new rates of pay were based upon the size and output of each hatchery, the number of men employed and the responsibilities of each particular station. These adjustment advances in salaries, coupled with improvements in handling equipment and the close check of pay rolls for extra, or seasonal labor, have not increased operating costs, but have developed better interest in the work, a more contented and cooperating personnel.

In concluding this report on the activities of the Division of Fisheries, of the Department of Fisheries and Game, for the biennium ending March 31, 1927, I wish to take this opportunity to express for all employed in the department, in whatever capacity, our appreciation of your helpfulness and confidence in the discharge of the various requirements and ramifications of our work.

Respectfully submitted,

CHARLES R. POLLOCK,
Supervisor of Fisheries.

THE OYSTER INDUSTRY OF WASHINGTON.

BY PROFESSOR TREVOR KINCAID
University of Washington.

The oyster industry of the Pacific Coast does not compare in magnitude with that of the Atlantic Seaboard, since the areas suitable for oyster culture on the western side of the continent are limited owing to the general conformation of the coastal areas. For hundreds of miles along the coast the shoreline consists of broad sandy beaches separated by rocky headlands against which a violent surf continuously beats. Only in Puget Sound and Willapa Harbor on the north and San Francisco Bay to the south do we find any considerable development of that embayed and estuarial condition which favors the production of oysters. Similar but less extensive areas of the same type occur on the coast of Oregon at Yaquina Bay and Coos Bay, and in the more protected interior waters of British Columbia.

Only on Puget Sound and in Willapa Harbor has the oyster industry attained any considerable dimensions, although a few areas in British Columbia and on the coast of Oregon support small but locally important oyster producing centers. To the southward San Francisco Bay has been for a long time an important area for the production and distribution of oysters, but activities there have been largely limited to the growth of transplanted eastern oysters brought across the continent either as seed or partially matured oysters.

The species of oyster indigenous to Mexican waters, considerable beds of which exist in the Gulf of California, has recently been introduced into the markets of some of the California cities through concessions granted to the American promoters by the Mexican government.

The possibility of growing this species in certain of the estuaries of southern California has been called to the attention of those likely to be interested, but as yet little has been done to determine the practicability of the suggestion.

Unlike the industry of the eastern coast, which is based upon the production of a single species of oyster (*Ostrea virginiana*), the Pacific area

supports at least four types of oyster life. The species which has formed the basis for commercial production is the small indigenous oyster known to science as *Ostrea lurida*, but commonly known as the "native" or Olympia oyster, the latter name arising from the fact that the city of Olympia has been the clearing house for the industry since its inception. This species formerly existed in large quantities in Willapa Harbor, but these beds were seriously depleted in early days before the importance of conserving the supply had been grasped and at present the production of native oysters in the Willapa region has been reduced to negligible proportions.

The relatively small oyster industry of British Columbia is also based upon the "native" oyster and the same is true of the several indentations of the coast line of Oregon, notably Yaquina Bay, where oystering is still being carried on upon the remnants of beds once quite extensive but now greatly depleted. The native oyster is reported to exist in certain areas in Southeastern Alaska but those, if they exist, have no commercial importance. To the southward the indigenous oyster ranges to the Mexican boundary but it is of little economic importance on the coast of California.

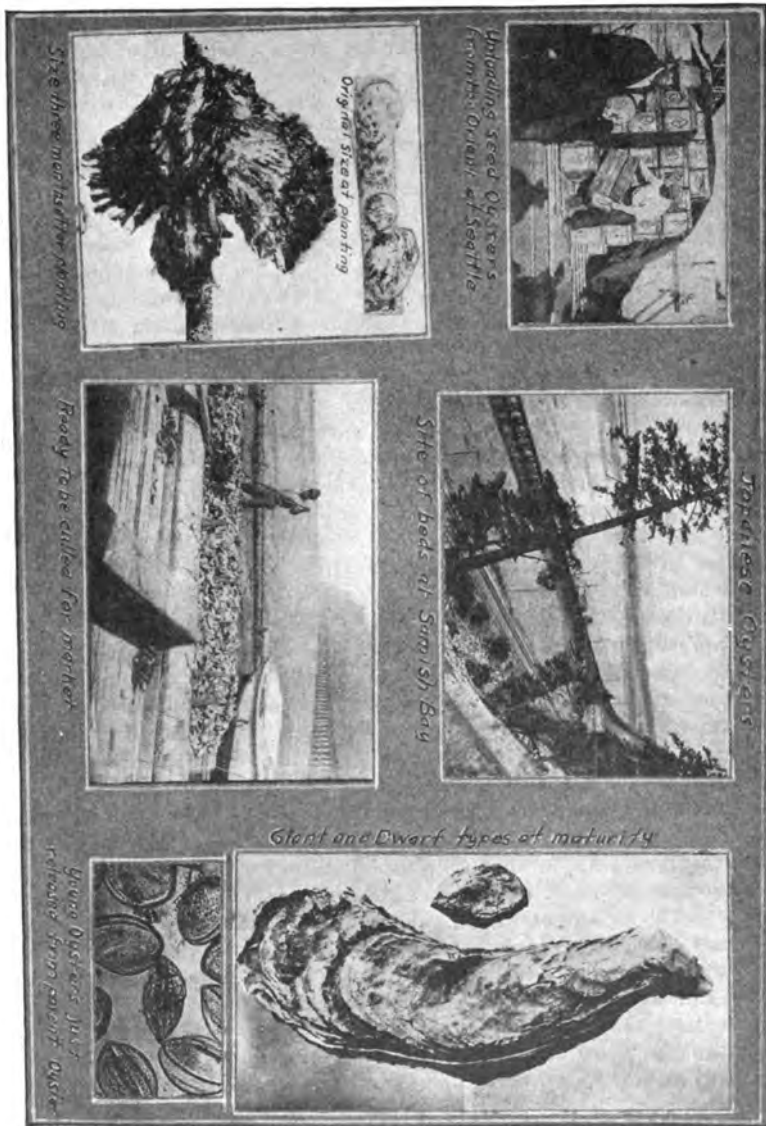
The oyster industry of Puget Sound was originally conducted by the Indians who brought the molluscs to the early settlers directly from the natural beds. With the development of systems of transportation the demands upon the supply became greater and a period of depletion approaching a state of exhaustion ensued with a corresponding rise in price. The restoration of the beds was brought about through the utilization of methods which were partly the result of a study of practices discovered in Europe, especially on the coast of France, but mainly through empirical observations made by the more progressive and intelligent oystermen. As a result there has been devised a system of culture which is unique and yet remarkably well adapted to its purpose, and the area under tillage has been constantly increased as the demand warranted larger investments in the industry. Notwithstanding its small size the Olympia oyster is unequalled in certain phases of oyster cuisine, especially for cocktails, pan roasts and soups.

Second in importance is the eastern oyster (*Ostrea virginiana*) which is consumed in large quantities on the Pacific Coast. Most of the product utilized is shipped in from the great oyster centers of the Atlantic region. Considerable effort has been put forth in attempting to produce eastern oysters on a commercial scale by bringing over the small seed oysters from the Atlantic and bedding them in western waters. This industry was initiated many years ago in San Francisco Bay and was later conducted on a considerable scale in Willapa Harbor and in Puget Sound, but never has been a complete success owing to a number of factors, the most serious drawback being the fact that the Atlantic species will not propagate when removed from its normal habitat except under very unusual conditions, and again because the shallow water areas in which it was cultivated did not represent the normal environment of this type of oyster. As a result the transplant industry has not attained the magnitude which was hoped for when the plan was first brought into effect. Few transplants are now grown in Puget Sound, while in Willapa Harbor, where the conditions seemed more favorable, the industry was maintained on a considerable scale till recent years when difficulties arose which caused this branch of the business to suffer a decline and most of the companies operating in this field went into liquidation. In one section of the Harbor, the estuary of the Nasel

River, the cultivation of the eastern species has continued successfully for the reason that in this area the oyster propagates on a large scale and occasionally produces a set of young oysters which thrive in the relatively deep channel of the river. By initiating the proper measures for collecting the spat it seems highly probable that the present crop might be multiplied many times. It is an established fact that these naturally spawned oysters produce a product that is unsurpassed for size, shape and flavor.

The third species of oyster to assume commercial importance on the Pacific Coast is the Japanese species (*Ostrea gigas*). A number of attempts to acclimatize this mollusc in our waters were made during the past twenty years. Sufficient was learned from the earlier experiments to determine that the Oriental species will thrive in our waters and to warrant the attempt to introduce it on a commercial scale through the importation of seed oysters from Japan. The first consistent effort in this direction was made in 1905 by a group of Japanese who acquired control of an area of oyster land on Samish Bay to the southward of the city of Bellingham. The initial shipment survived the journey across the Pacific and the young animals readily adapted themselves to the mid-tide flats on which they were bedded out and grew with great vigor. They matured into oysters of surprising size and many of them reached a marketable condition two years later. Difficulties were encountered by the Japanese company in marketing their product, owing to the unfamiliarity of the public with the oriental species, and about this time the legislature of the state of Washington put into effect a law which greatly restricted the ownership of land by aliens. As a result of these conditions the Japanese company was forced out of business and transferred their plant and stock to a corporation known as the Rock Point Oyster Company, which entered upon the business of importing and maturing the Japanese oysters on a much larger scale. The enterprise has proven most successful and has been greatly expanded during recent years. The young oysters are brought over in wooden cases having a capacity of about four cubic feet in which the cultch consisting of bamboo brush or oyster shells is closely packed. The cases are carried as a deck-load upon the transpacific liners and the young oysters come through with surprisingly little loss. It would seem likely that the Japanese oyster may supplant the eastern species in local markets owing to the fresh condition of the product brought directly from beds within easy reach of our oyster consuming public. The principal limitation upon the expansion of this branch of the industry into other areas is the danger of importing with the young oysters dangerous pests. Several of these have already appeared in the Samish region and have established themselves by breeding. The introduction of these oyster enemies into the regions where the native oyster is grown would be a serious matter and it is suggested that for the present no plantings of Japanese oysters be made at points south of Deception Pass.

As in the case of the eastern oyster there is no indication of a set of young oysters derived from the maturing transplants although the eggs and sperm mature in a normal manner and are perfectly viable as they readily unite when brought together artificially. Experiments have been conducted to determine the feasibility of producing the spat through a system of controlled operations after the manner of a fish hatchery. Some very interesting results were obtained and promise ultimate success along these lines



but further experimentations will be necessary before a system can be devised that will be commercially practicable.

The fourth species of oyster utilized on the West Coast is the type grown in Mexican waters. On account of its southern range it is not likely to grow successfully in our waters. Several attempts have been made to bring up small quantities from the Gulf of California but the experiments have not been well planned and up to this time all have perished in transit.

A more detailed account of the oyster industries of the state of Washington is in preparation by the writer which will be published by the State Supervisor of Fisheries in separate form in the near future.

TRADE WASTE INVESTIGATIONS.

1926, April 1, 1927.

By H. W. NIGHTINGALE, State Sanitary Engineer.

A Preliminary Report on the Present Physical, Chemical, and Biological Conditions of the Sea Water In the Vicinity of Shelton, Which Will Have a Bearing Upon the Probable Effect of Sulphite Pulp Waste On Adjacent Oyster Growing Areas.

INTRODUCTION.

In the interest of the Olympia Oyster Growers Association, the State Department of Fisheries requested the State Department of Health to collect such data and make such observations as are pertinent to the probable effect of the discharge of sulphite pulp waste at Shelton on the oyster beds in Oakland Bay and adjacent waters.

Since October 22nd the State Department of Health has devoted as much time as possible to this problem. During this period, Frank R. Shaw, Associate Sanitary Engineer of the U. S. Public Health Service, was present in the state in the interest of interstate shipments of shellfish, and rendered aid on the field work in connection with the report.

The present Physical, Chemical, and Biological Conditions:

1. Physical.

A pulp mill is now being constructed at Shelton on the south side of the extreme southwest end of Oakland Bay. It is understood that this mill will have a capacity of one hundred tons of sulphite pulp daily.

Recent investigations in Wisconsin have revealed that a sulphite mill produces three gallons of diluted waste liquor per pound of pulp. Therefore, on this basis, it may be presumed that this mill will discharge approximately 600,000 gallons of diluted waste liquor daily.

Oakland Bay is approximately 27,000 feet long and 3,000 feet wide. It is comparatively shallow, being only one-and-one-quarter feet to eight fathoms deep at the deepest portion at mean low tide, gradually lessening to a feather edge at the shore. The only outlet to this Bay is Hammersley Inlet which is a very narrow passage running due east to Pickering Passage. Hammersley Inlet is approximately 33,000 feet long, averages 1,200 feet wide, and has a depth varying from 1-½ feet to 9 fathoms at mean low tide. The point at which this inlet takes off from Oakland Bay is 4,800 feet from the mill, thus placing the discharge of the liquor into a pocket. It would be expected that with ebbing tide the waters of the

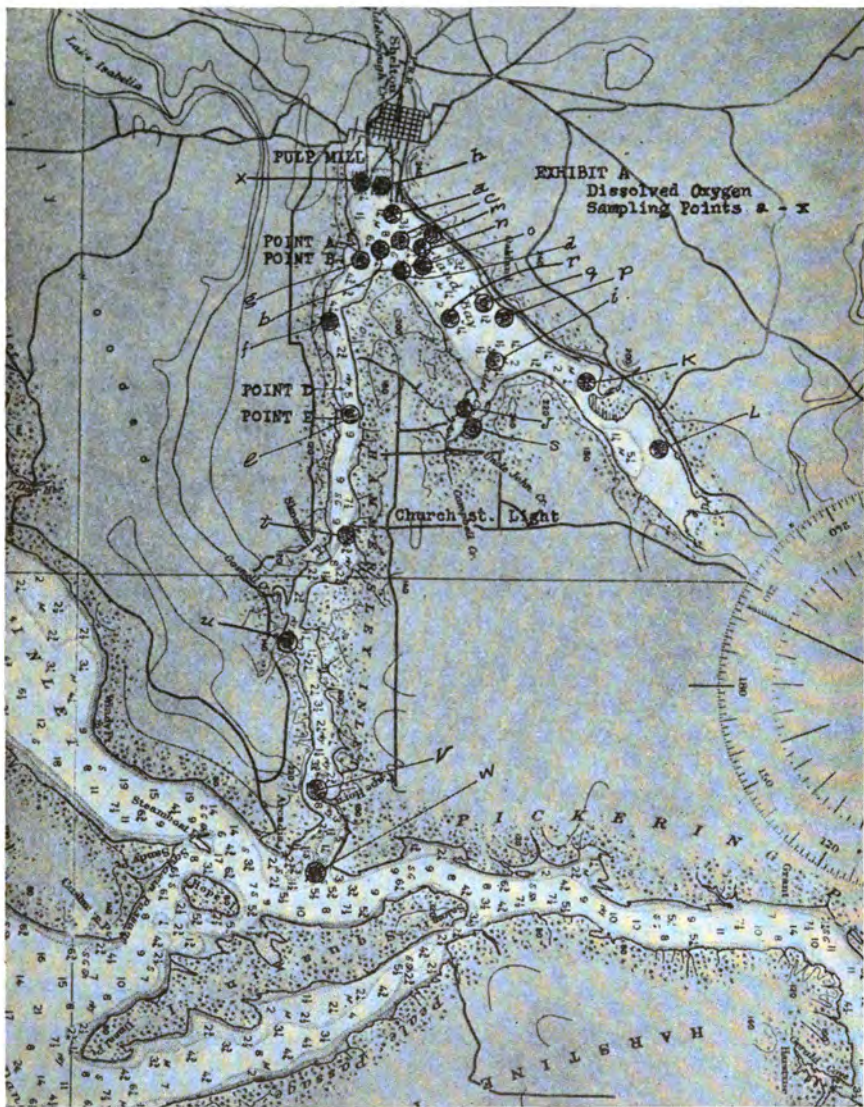


Exhibit A. Study of Tidal Flow, Hammersley Inlet.

upper part of Oakland Bay would rush into Hammersley Inlet forming a water dam tending to hold back the water and waste in the pocket referred to above. At least the water in the pocket would flow out only gradually, as the water level lowered, and there would not occur the complete emptying or rush and scouring as would occur if the hydrography was different. These features may be clarified by reference to Exhibit "A."

It was readily seen that factors of primary importance were the probable direction and extent of travel of the waste during the ebb and flow of the tide. In other words, where would the waste be likely to flow to under varying conditions of tide? For this purpose, floats were constructed of sealed oil cans of one gallon capacity, weighted so as to draw them below the surface of the water and thus prevent drifting due to wind action.

On the morning of October 22nd, two floats (Nos. 1 and 2), were placed in the bay near the pulp mill, at 8:20 A. M., approximately one hour after the beginning of ebb tide. At 10:20 A. M. float No. 3 was liberated by the mill. Floats Nos. 1 and 2 reached the upper end of Hammersley Inlet at 8:50 A. M., thirty minutes after being placed. At 9:45 A. M. float No. 2 became lodged in an eddy below Point "6," and, after moving it out into midstream, it, together with float No. 1 became lodged in a large eddy just above Church Point Light.

For this trial test we had believed that the proper procedure was to consider the test concluded when the floats ceased traveling, and for this reason, together with the fact that we were not available to transfer them to midstream at the moment they became lodged in the eddy, we did not get further data on the extent of travel. This showed, however, that we could not expect all of the waste to proceed directly down the mid-current. Some of it may drift over into these eddies. Float No. 3 was found at a stand-still in the middle of the bay opposite Hammersley Inlet at 12:45 P. M., two hours and fifteen minutes after it had been placed by the mill—apparently in a huge eddy.

At 1:45 P. M. the afternoon of October 22nd, four floats were placed at the upper end of Hammersley Inlet for the purpose of studying the currents during the flow of the tide. Float No. 2 revealed a back-current close to the south shore. Float No. 1 revealed a direct coastwise current along the east shore towards Swindel (Chapman) Cove, where oyster grounds are located. Floats Nos. 3 and 4 revealed a large eddy in the Bay directly opposite Shelton on one side and Hammersley Inlet on the other side. We reset float No. 2 just above the effect of this eddy, and by 4:30 P. M., two hours and sixteen minutes before the completion of flowing tide, it was within one-fourth mile of the oyster growing areas in Swindel (Chapman) Cove, and traveling slowly in the direction of said areas. It was impossible to observe the floats further because of darkness.

The study shows, however, that a large eddy is developed in the center of the Bay opposite the "pocket" (and possibly in the pocket), and that outside of this area there are direct currents flowing in the direction of the oyster grounds. It is reasonable to suppose that if the reset float No. 2 traveled 5,000 feet in one hour and ten minutes, it would have traveled the remaining 1,320 feet in the remaining two hours and sixteen minutes, thus placing it over the oyster beds.

On October 23rd four floats were placed at the upper end of Hammersley Inlet, at 9:05 A. M., forty-five minutes after the beginning of ebb tide. This lapse of time was to allow for the travel of the floats from the mill. It was believed that no purpose could be served by starting them at the mill, but by placing them in the manner we did a uniform distribution at that point was insured. From this we hoped to determine whether or not there was a direct current mid-stream. On this study we kept in close touch with the floats, as far as possible, and as soon as one would become lodged in an eddy it was moved out into the main current.

Throughout the upper half of the Inlet the floats frequently became lodged in eddies, but throughout the lower half a fairly continuous passage was realized. Float No. 1 did not become involved after Skookum Point and reached Pickering Passage before meeting the turn in the tide. When picked up at 2:50 P. M. it was floating towards Hope Island, which tends to verify our boatman's statement that any floatage coming out of Hammersley Inlet into Pickering Passage never returned to the former but, rather, floated up Totten Inlet, Budd Inlet, or Peale Passage. Floats Nos. 2 and 3 reached Cape Horn, where, seemingly, they met the turn of the tide, as did No. 4 at a point higher up.

On November 5th, an additional study of flowing tide was made. Profiting by the experience of our first test, the floats were placed above the huge eddy. At times these floats seemed to be held back by local eddies or calm areas, but when it became necessary to pick them up, on account of darkness, floats Nos. 1, 2, and 3 had closely approached the Chapman Cove oyster grounds. It is believed that Nos. 1, 2, and 3 would have certainly entered Chapman Cove, whereas it is extremely likely that float No. 4 (in the lead, but lost after 3:46 P. M.) went well beyond the point where last seen and in the direction of the Narrows. The boatman concurred in this opinion, and at the outset had stated that the current to the Narrows was well towards the north side of the bay. At 5:00 P. M., fifty-one minutes before flood tide, the floatage—logs, bark, etc.,—had practically reached the oyster grounds in Chapman Cove.

Oil from the mill fouled the shore directly opposite Chapman Cove oyster grounds when a scow containing oil was wrecked some years ago. This observation was made by a number of residents of Shelton.

2. Chemical Observations.

A series of chemical tests of the present condition of the sea-water in Oakland Bay and Hammersley Inlet were made on November 3rd, 4th, 5th and 6th, 1926, to ascertain the amount of dissolved oxygen and the salinity now existing. These tests were made at certain stations, the locations of which are shown on Exhibit "A." The results are appended in Exhibit "F."

The amount of dissolved oxygen in the Bay and Inlet was found to be normal for a Bay and Inlet of this configuration. The actual quantity of oxygen which sea water is capable of dissolving is somewhat less than fresh water under like conditions. An average of 84% saturation of oxygen was found in the samples from the Bay and Inlet.

The salinity of the sea-water was also ascertained at the above stations. The salinity of the water near the Shelton docks and in Chapman Cove

was lower than at the other stations, showing the admixture of fresh creek water.

In order to obtain the necessary information as to the oxygen destroying qualities of sulphite waste liquor as it is discharged from pulp mills, samples of this red liquor were obtained directly from the blow pits of the digesters at the Anacortes and Port Angeles mills. Samples of the waste liquor were taken from the blow pits in order to obtain the liquor in its original concentrated state. It is evident that samples taken from the outlet pipe are not representative, owing to the fact that throughout a period of discharge the concentration varies continuously as the liquor is washed from the digesters.

Preliminary analyses of the sulphite liquor were made by Mr. A. Jacobson, Analytical Chemist of Seattle, Washington, and by the Sanitary Engineer, State Department of Health. Exhibit "G," appended, shows the results of these analyses. The total dissolved matter in the sulphite liquor from Anacortes shows a concentration of 11.2%; that of Port Angeles, 8.2%. These concentrations are average for the undiluted sulphite liquor, as shown by results from pulp mills located in other sections in the United States. The acidity of the liquor from both plants was slight, averaging .14%. Since the figures indicate a waste liquor of average concentration, the results concerning oxygen destroying power or "Oxygen Demand," may be compared with results of experiments conducted elsewhere in the United States.

OXYGEN DEMAND.

The undiluted sulphite liquor as described above was diluted with water containing a known amount of dissolved oxygen. The standard methods of water analysis were followed in making the Oxygen Demand tests. Dilutions of 1/100 up to 1/10000 were made and the sealed bottles incubated for varying periods of time at 20°C, from a few minutes up to five days.

The dilution method of analysis was employed for the reason that it is a recognized procedure. Furthermore, it offers a direct comparison with the actual dilutions obtaining where trade wastes are dumped from mills into adjacent bodies of water.

Exhibit "H" shows the result of the Oxygen Demand analyses. The demand is high, being many times greater than that of sewage. The immediate oxygen demand for Anacortes and Port Angeles sulphite liquor ranges from 2,000 to 2,200 parts per million. The five-day demand ranges from 9,800 to 25,000 for the Anacortes liquor and from 7,400 to 20,000 for Port Angeles, depending upon the dilution.

The oxygen demand data show that the waste liquor immediately uses up a portion of the oxygen in water containing this liquor. The extent of immediate oxygen demand of the sulphite liquor in Oakland Bay will therefore depend upon the volume discharged and the volume of sea water with which it comes in contact. The oxygen demand of the waste is higher if it is in contact with the same water for a longer period. Consequently, if there is an accumulation of the waste liquor in Oakland Bay, depletion of the oxygen will be greater. It has been observed that the waste liquor is soluble in all proportions with water and diffuses very rapidly.

From the Wisconsin data of February, 1926, it is stated that sulphite pulp mills produce approximately one gallon of undiluted sulphite liquor

per pound of pulp. On the basis of these figures, a 100-ton pulp mill would discharge approximately 200,000 gallons of the undiluted sulphite liquor daily.

On the basis of our data the immediate oxygen demand of the undiluted sulphite liquor averages 2,100 parts per million. The one-day demand from the Wisconsin data is 8,200; the five-day demand is approximately 15,000, as derived from our data and that of Wisconsin. The immediate oxygen demand from these figures is approximately one-quarter of the one-day demand and one-seventh of the five-day demand.

Assuming that the mill begins discharging its waste liquor at the beginning of ebb tide, it is shown by our float studies, that the quantity of liquor discharged during the ebbing of the tide will probably be distributed throughout Hammersley Inlet. Upon the turn of the tide the water of Hammersley Inlet, now charged with the waste will be pushed upstream into Oakland Bay, where it will likely receive additional quantities of waste liquor.

A full day's discharge from a 100-ton mill would introduce into Hammersley Inlet sufficient waste to cause a concentration of approximately 1 to 4,700 of liquor to sea water.

It is logical to assume that this concentration will be materially diluted with water from Pickering Passage, but as the whole mass travels up and down Hammersley Inlet and into and out of Oakland Bay it will receive additional charges of the liquor. It is reasonable to anticipate that the concentration will increase to a point where it would be harmful to fish life. As granted from various authorities, when the dissolved oxygen is reduced to below 2 parts per million or from 25-30% saturation, major fish life is endangered.

The above figures transposed into terms comparable with our statement of concentration, would be 1 to 2,000. It can be observed that this concentration is only about twice as great as our initial concentration of 1 to 4,700.

3. Biological Observations.

A tow net was employed at the various stations in Oakland Bay and Hammersley Inlet at which the sea water samples for chemical analysis were taken.

The microscopic organisms or plankton, as they are called, were found to be abundant at all stations except in the neighborhood of the sewer outlet near the Shelton docks. These organisms, which form the basic food supply for the shellfish, consisted of diatoms largely of the genus *Coscinodiscus*, with smaller numbers of *Chaetoceros*, *Melosira* and *Pleurosigma*. It therefore appears that the oyster food was developing normally in the bay and inlet at the time the observations were made.

From observations made by the State Board of Health of Wisconsin, also by Marsh and Knight, as cited in Report on Stream Pollution by the New York State Conservation Commission, sulphite liquor is known to be destructive to fish life.

It is known to investigators who are now studying artificial propagation of oysters that the oyster larvae are very susceptible to adverse changes in their environment. Although no experiments have been made to date concerning the effect of this waste on oyster larvae, it is reasonable to

suppose that it will have a deleterious effect on them. The flavor of the adult oyster might be changed, thus affecting their market value.

Concerning the effect of the waste liquor on marine fish life, it was stated by the Superintendent of the Anacortes mill that ship-worms were not destroying the new piling on the lumber wharf to the extent they formerly did.

CONCLUSIONS.

1. From this preliminary investigation it is concluded that the mill is so located with respect to shellfish growing areas that the discharge of its waste will create a potential danger.

2. The volume of waste which is likely to be discharged by a mill of 100-tons capacity compared to the volume of sea-water available for aeration, together with local tide effects, suggests the likelihood of the concentration reaching the point where it would be destructive to fish life.

3. From a standpoint of the chemical determinations on the sea water in Oakland Bay and Hammersley Inlet, the conditions now appear to be normal for the support of marine life. The samples of sulphite liquor from Anacortes and Port Angeles show the waste to be of a similar character to that discharged from the Wisconsin mill. Its oxygen demand is similar.

4. In view of the factors suggestive of potential danger, it is recommended that steps be taken by the mill company to so handle the waste as to reduce its possible effect upon shellfish. Satisfactory results might be secured by hauling in tank-barges a certain portion of the discharge to Pickering Passage, below Salmon Point. The dissolved oxygen in the water of Oakland Bay would then be more nearly able to oxidize the remaining waste.

5. We have reason to believe from the Wisconsin studies that the oxygen demand of this waste can be materially lessened by efficient aeration. However, we do not recommend aeration at the present time as a substitute for tankage of the liquor. It is our recommendation that tankage be instituted at the start of operation of the mill and that an experimental aerator be installed at the plant in order to ascertain the efficiency of this method of treatment, together with the extent to which it need be carried.

6. The quantity of waste that should be hauled to and deposited in Pickering Passage will be dependent upon the variation in the concentration of the liquor and the ability of the water in the Bay to oxidize the remaining waste. These factors are indeterminate until the mill is operated, but it is considered reasonable to request the Company to provide for the tankage of sixty per cent (60%) of the waste liquor at the start of operation. If the operation of this plant permits the withdrawal of concentrated liquor before wash water is applied, as seems to be the case in the Wisconsin mills, it will be possible to economize considerably on the size of the tanks used to haul off this liquor.

Exhibit H.

OXYGEN DEMAND DETERMINATIONS.

Five-Day Incubation at 20° C. Expressed In Parts Per Million.

Sample Number	SOURCE	Water Blank 92% Saturated			COMPUTATIONS				Notes	
		Initial O ₂ P. P. M.	Final O ₂ P. P. M.	Depletion P. P. M.	Concentration Factor In %	Depletion In P. P. M.		Concentration Factor		Oxygen Demand In P. P. M.
						As Found	Less Blank			
1	Anacortes.....	8.4	7.1	1.3	.01	3.8	2.5	10,000	25,000	.....
2	.....	8.4	7.1	1.3	.....	.....	.....	.....	.....	.....
3	Anacortes.....	.....	.....	1.3	.02	4.6	3.3	5,000	16,500	.....
4	Anacortes.....	8.4	7.1	1.3	.03	5.3	4.0	3,333	13,333	.....
5	Anacortes.....	.....	.....	1.3	.04	5.7	4.4	2,500	11,000	.....
6	Anacortes.....	8.3	7.0	1.3	.05	6.2	4.9	2,000	9,800	.....
7	Port Angeles.....	8.4	7.2	1.2	.01	3.2	2.0	10,000	20,000	.....
8	Port Angeles.....	8.4	7.2	1.2	.02	4.0	2.8	5,000	14,000	.....
9	Port Angeles.....	8.4	7.2	1.2	.05	4.9	3.7	2,000	7,400	.....
10	Anacortes.....	8.4	7.2	1.2	.1	.....	.....	.....	.....	Oxygen exhausted
11	Anacortes.....	8.4	7.2	1.2	.2	.....	.....	.....	.....	Oxygen exhausted
12	Port Angeles.....	8.4	7.2	1.2	.1	.....	.....	.....	.....	Oxygen exhausted
13	Port Angeles.....	8.4	7.2	1.2	.2	.....	.....	.....	.....	Oxygen exhausted

Exhibit H.

OXYGEN DEMAND DETERMINATIONS.

Immediate Demand Expressed In Parts per Million.

Sample Number	SOURCE	Water Blank 80% Saturated			COMPUTATIONS					Incubation Period
		Initial O ₂ P.P.M.	Final O ₂ P.P.M.	Depletion P.P.M.	Concentration Percent	Depletion In P.P.M.		Concentration Factor	Oxygen Demand P.P.M.	
						As Found	Less Blank			
1	Anacortes.....	5.8	5.8	0.0	.1	2.1	2.1	1,000	2,100	15 minutes
2	Anacortes.....	5.8	5.8	0.0	.1	2.2	2.2	1,000	2,200	¼ hour
3	Anacortes.....	5.8	5.8	0.0	.1	2.1	2.1	1,000	2,150	1 hour
4	Anacortes.....	5.7	5.7	0.0	.1	2.2	2.2	1,000	2,200	5 hours
5	Port Angeles.....	5.7	5.7	0.0	.1	1.5	1.5	1,000	1,500	15 minutes
6	Port Angeles.....	5.7	5.7	0.0	.1	1.8	1.8	1,000	1,800	1 hour
7	Anacortes.....	5.8	5.8	0.0	1	5.8	5.8	.....	.....	1 hour all O ₂ used up
8	Port Angeles.....	5.8	5.8	0.0	1	5.8	5.8	.....	.....	1 hour all O ₂ used up

Exhibit F.

CHEMICAL AND BIOLOGICAL DATA OF SHELTON BAY AND TRIBUTARIES.

Sample Number	Time Taken	Temp. of Water	OHLORINE		DISSOLVED OXYGEN		Plankton Collected
			c. c. Ag. HO ₂	P. P. M.	c. c. Thio-sulphate	% Satura-tion	
(Date November 3, 1926; Low Tide, 11:14 A. M.; High Tide, 5:06 P. M.)							
a.....	3:20 A. M.	12.5°	9.2	18,400	7.75	86.1	Abundant
b.....	12.5	9.2	18,400	7.70	88.4	Abundant	
c.....	12.5	8.8	17,600	7.75	78.6	Abundant	
d.....	4:30 P. M.	12.0	8.7	17,400	7.75	87.0	Abundant
(Date November 4, 1926; Low Tide, 11:51 A. M.; High Tide, 5:28 P. M.)							
e.....	1:00 P. M.	12.5	8.4	16,800	7.65	86.2	Abundant
f.....	1:40 P. M.	12.5	9.25	18,500	7.75	89.1	Abundant
g.....	1:55 P. M.	12.4	9.70	19,400	7.70	89.4	Abundant
h.....	2:30 P. M.	12.1	6.9	13,800	7.80	78.6	Abundant
i.....	4:50 P. M.	12.1	7.7	15,400	7.70	84.4	Abundant
j.....	5:10 P. M.	12.0	7.8	15,600	7.75	85.1	Abundant
k.....	5:30 P. M.	12.0	8.4	16,800	5.40	60.5	Abundant
l.....	5:50 P. M.	12.0	8.1	16,200	7.10	78.4	Abundant
(Date November 5, 1926; Low Tide, 12:28 P. M.; High Tide, 5:51 P. M.)							
m.....	12:45 P. M.	12.0	8.7	17,400	7.6	85.4	Abundant
n.....	1:00 P. M.	12.1	7.7	15,400	7.5	82.8	Abundant
o.....	1:13 P. M.	12.0	8.1	16,200	7.55	83.6	Abundant
p.....	2:55 P. M.	12.1	9.1	18,200	7.45	84.7	Abundant
q.....	3:09 P. M.	12.0	8.7	17,400	7.35	82.5	Abundant
r.....	3:12 P. M.	12.0	7.9	15,800	7.45	82.0	Abundant
s.....	4:40 P. M.	12.0	8.3	16,600	7.60	84.5	Abundant
(Date November 6, 1926; High Tide, 7:32 A. M.; Low Tide, 1:07 P. M.)							
t.....	10:10 A. M.	13.0	9.0	18,000	7.25	83.7	Abundant
u.....	10:25 A. M.	12.8	9.2	18,400	7.60	87.7	Abundant
v.....	10:45 A. M.	13.0	8.9	17,800	7.65	87.0	Abundant
w.....	11:00 A. M.	12.0	11.1	22,200	7.75	94.3	Abundant
x.....	12:30 P. M.	12.8	4.0	8,000	8.20	84.0	None

COPY OF LETTER:

EXHIBIT G.

Mr. H. W. Nightingale,
State Dept. of Health,
Seattle, Washington.

Seattle, Wash., January 11, 1927.

Dear Sir: Please find below, the results of the following tests on samples of water from "Anacortes" and "Port Angeles" Pulp Plants:

"Anacortes" Plant.

	<i>Parts Per Million</i>
Total Solid Matter in Solution.....	112460.00
Loss on Ignition (Organic Matter).....	93820.00
Material in Suspension	None
Acidity (Sulphurous Acid and Sulphites).....	1792.00
Specific Gravity at 20 Degrees.....	1.0486
Nightingale	1.0500

"Port Angeles" Water.

Total Solid Matter in Solution.....	82960.00
Loss on Ignition (Organic Matter).....	71560.00
Material in Suspension	None
Acidity (Sulphurous Acid and Sulphites).....	1260.00
Specific Gravity at 20 Degrees.....	1.0331
Nightingale	1.0350

Respectfully,

A. JACOBSEN,
Analytical Chemist.

Following the Shelton investigation, an inspection of Chambers Creek at the mill site near Steilacoom was made on March 16th, 1927.

Chambers Creek is a small stream which enters the Sound near Steilacoom. The creek broadens considerably just prior to its entrance into the Sound and the tidal influence is considerable to a point above the mill. On flood tide the fresh water is backed up-stream. A small spit just above the mouth near the railroad trestle tends to prevent a free egress of the creek water on the ebb tide. The creek is shoal above the mill, having a depth at low tide of only about two feet.

There were four classes of waste visible near the mouth of this creek:

1. A soapy discharge from the outlet pipe of the mill into forebay of the creek.
2. An accumulation of black ash (carbonaceous matter) adjoining the bank of the creek, above outlet pipe.
3. An accumulation of white sludge apparently waste lime.
4. Waste fibers of pulp and sawdust.

1. The soapy discharge proved to be warm and slightly alkaline pH 7.6. A white cloud of this matter was observed moving up-stream with the pressure of flood tide against it. Owing to the small volume of water with which it was mixed the visible effect was considerable. The liquid proved to have a density of 1.001 or essentially the same as fresh water. No free caustic alkalinity was present. Whether this discharge represents an average density can only be determined by samples taken at different times of the day and night.

2. The accumulation of black ash is considerable. This ash is produced as a waste substance from the lime soda process in the manufacture of wood pulp. There were no evidences of this black ash on the creek bottom, though a portion of it was in contact with the creek bank. The substance is heavier than water and has been known to smother shell fish

beds. There is no evidence of carelessness in the handling of this solid waste at present.

3. The solid white waste, apparently lime sludge, from its chemical reactions, is also located in a pile which is not at present washing into the creek. This waste proves to be nearly insoluble in water.

4. Waste fibers were not numerous and no evidence was found to indicate a deposition on the creek bottom. Sawdust was being fed into conveyor as a raw material. None was found in the creek. This process is apparently the lime-soda method of manufacturing wood pulp from short fibered material such as sawdust and fragments of wood.

Conclusions.

If the fish, after liberation, remain for any length of time near the outflow or pass through it slowly, there will no doubt be a deleterious effect upon them.

In order to overcome such an effect, the outlet pipe should be moved downstream and connected with a pipe line leading outside of the trestle.

OBSERVATIONS ON THE PACIFIC RAZOR CLAMS (*Siliqua patula*) OF THE STATE OF WASHINGTON.

From April 1, 1925, to March 31, 1927.

By HARVEY C. McMILLIN, Scientific Assistant,
U. S. Bureau of Fisheries.

It is believed that the best foundation for future protection of the razor clam industry can be obtained by publishing an annual resume of the conditions existing on the beds. In this way a permanent record of consecutive years is available, which, with the system of statistics already in use by the state, will give a reliable guide for regulation in years to come. To this end the present paper is offered.

April and May of 1925 were a sharp contrast to the preceding month. During March, clams were quite plentiful, and the success of the diggers was advertised and many men went to the beach to dig. It is probable that fewer clams were taken in April and May of 1925 than during the same time of any previous year in the history of the clam beds. The beach would not "hold up" during a whole run of tides. During the first few days of a series of low tides quite a few clams would show, but during the best tides the beach appeared to be almost entirely depleted. A few small clams on the high beach were taken.

During the 1926 season the digs were regular but not large. The 1923 class, which was one of the largest resulting from any spawning that has been observed, started to come into the commercial catch in appreciable numbers. Many of them were less than four and one-half inches long and their destruction will prove a serious loss to the industry.

Size Limit Is Needed.

Analysis of Table No. 1 throws some interesting light upon the general condition of the beds. Nearly 45% of the number of the clams taken had never spawned. They belonged to the classes of 1923 and 1924, and if left to grow for another year would produce four times as much cleaned meat as when taken. The next 26% belonged to the 1922 class, and had spawned but once; one out of every eight in this class was less than four

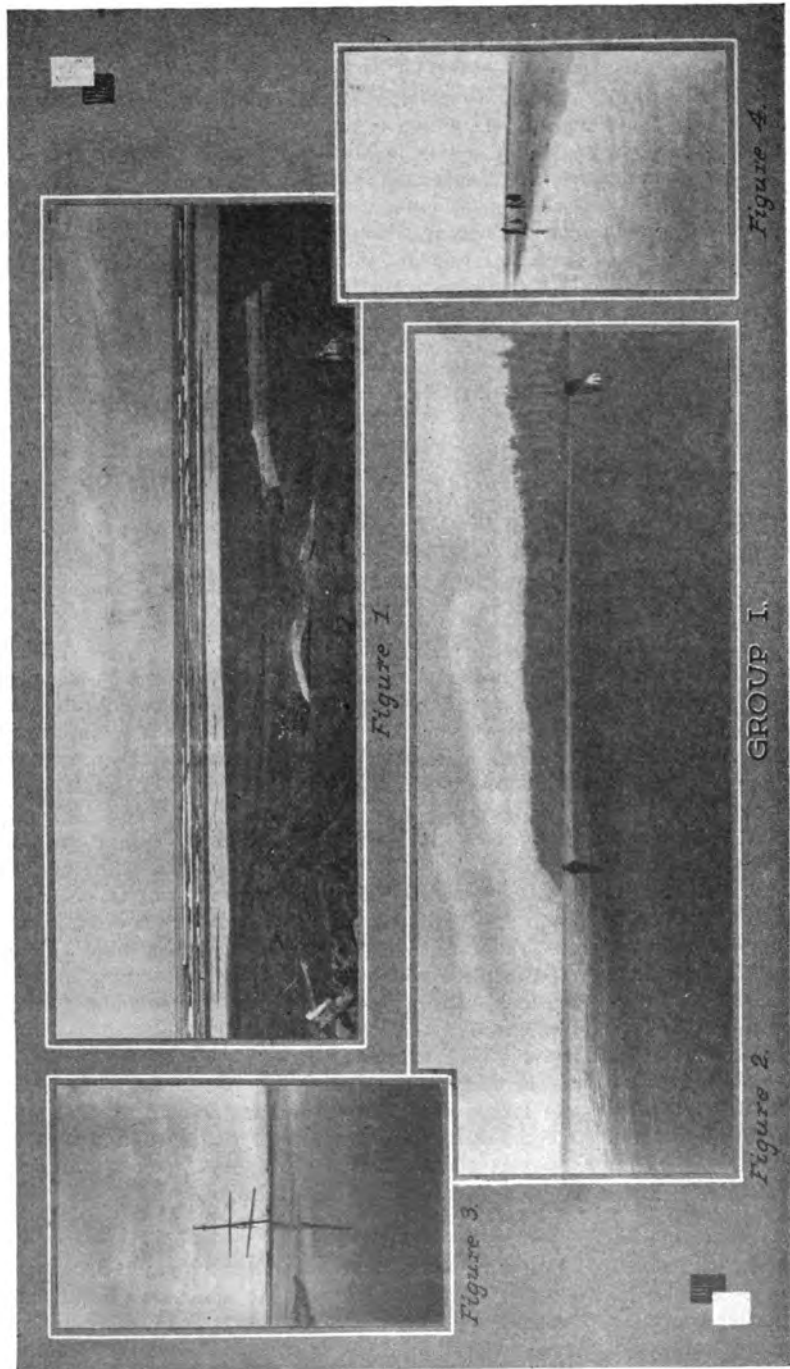


FIGURE 1.—Typical low tide scene. FIG. 2.—Showing width of Beach. FIG. 3.—Steamer Alice sunk in sand. FIG. 4.—Smooth surface of clam bed. (From McMillin Report, 1924)

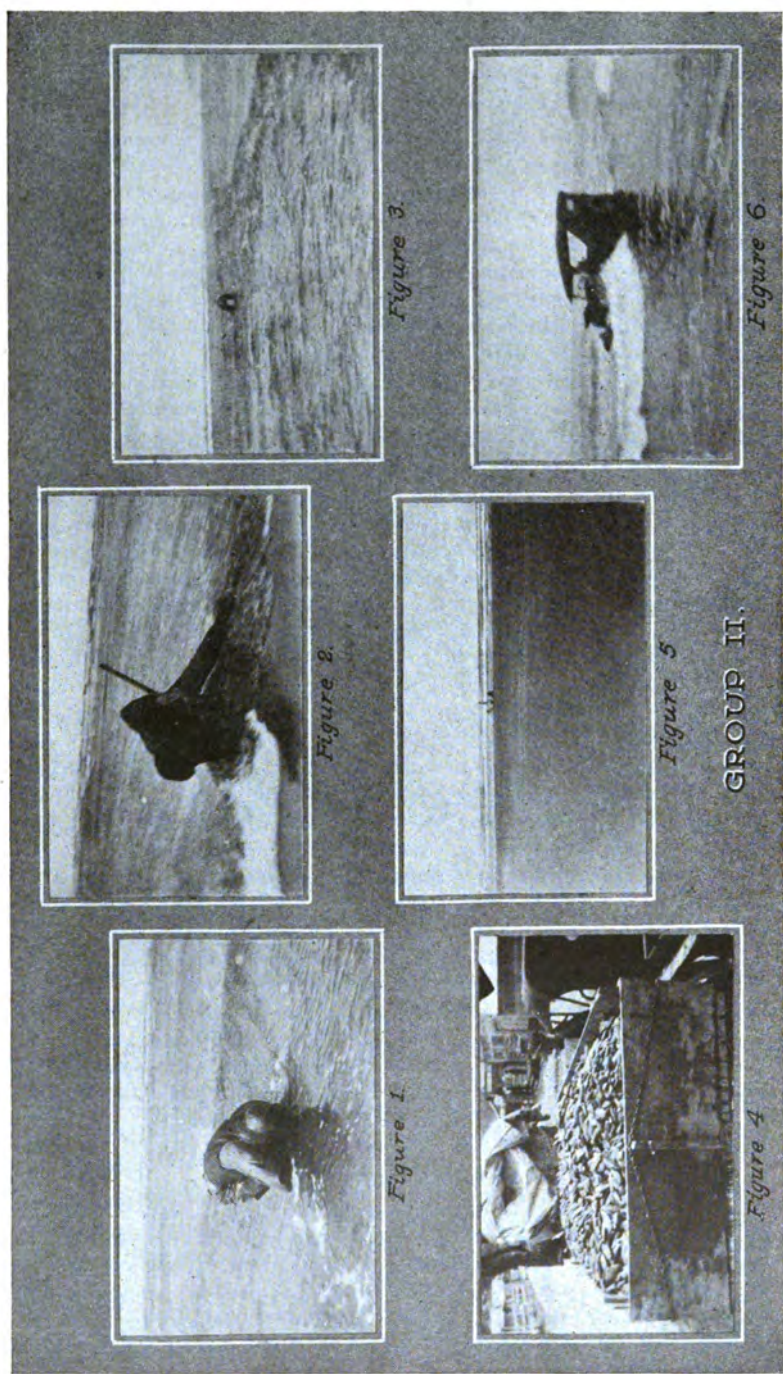
and one-half inches long. Thus we see that the present method of fishing is a direct economic loss which greatly injures the clam beds, and, as we shall show later, gives but a small return.

The average size of the catch has steadily decreased since actual records have been made. At present the clams are so small that it is nearly impossible for the canneries to operate. Since clams mature at two years of age and have an average span of life of about nine years, the present condition on the Washington beds may be compared to a cattle ranch. A rancher cannot operate permanently when 70% of the stock he sells each year is less than three years old, and half of the number is immature. In order to maintain a resource, a breeding reserve is necessary and such animals as are taken should have produced offspring. When it becomes necessary for him to sell every animal that he can corral, regardless of age and size, he is rapidly approaching the end of his resources.

Regulation which protects clams less than four and one-half inches long is in force in Alaska, and is proving very satisfactory. It has materially reduced the drain on the small clams, and is beneficial, not only to the beds, but to the diggers and cannerymen as well. Such protection applied to the Washington beds would curtail the pack for the first two or three years. The beds would be improved by the increased number of spawning clams, and subsequent years would show an improvement. While it is evident, as we have just stated, that a regulation which prohibits the taking of one-half the clams now found in the commercial catch, would reduce the pack when first applied, this regulation is not so serious as it might seem. The under-sized clams are very much smaller than the older ones, and when cleaned, produce a small amount of meat. The proposed restriction would result in a reduction of not over 20% of the pack. A pack of 25,000 cases under the present condition would be reduced to 20,000 cases. This is a material reduction, but future years would more than balance it, and the resource would be perpetuated. If it is necessary to over-dig the beds in order to maintain the industry at the present level it seems wiser to reduce the scale of operation rather than completely exhaust the supply of clams, which would in turn destroy the industry. The future of the clam as a resource, both from the tourist and commercial standpoint, depends upon the protection of the small clams. Other animals are protected until they reach maturity or attain certain size. Such limits are in force on trout, salmon, and crabs. There is immediate need for comparable protection for the razor clam. Tourists dig mostly in the summer time when tides are low, and would be little affected by such a size limit. It would apply in main to commercial diggers.

A Bag Limit Is Urgently Needed.

The attention of the writer has been called, repeatedly, to the large number of clams wasted by tourists. One auto camp owner stated that a conservative estimate of the clams allowed to spoil in his place was about fifteen hundred pounds per month from June 15 to September 15. Digging clams, especially razor clams, is a very enjoyable recreation, indulged in by every one without regard to age or sex. They are a rich food, and the amount which can be consumed by a person is limited. A bag limit for unlicensed diggers which would give them all they can enjoy would



FIGURES 1, 2, 3.—Digging in surf. FIG. 4.—Truck load of clams from Beach. FIG. 5.—Typical tourist diggers. FIG. 6.—
Tourist's mistake. (From McMillin Report, 1921)

prevent a great drain on this heavily exploited resource. A bag limit of four or five dozen clams seems advisable.

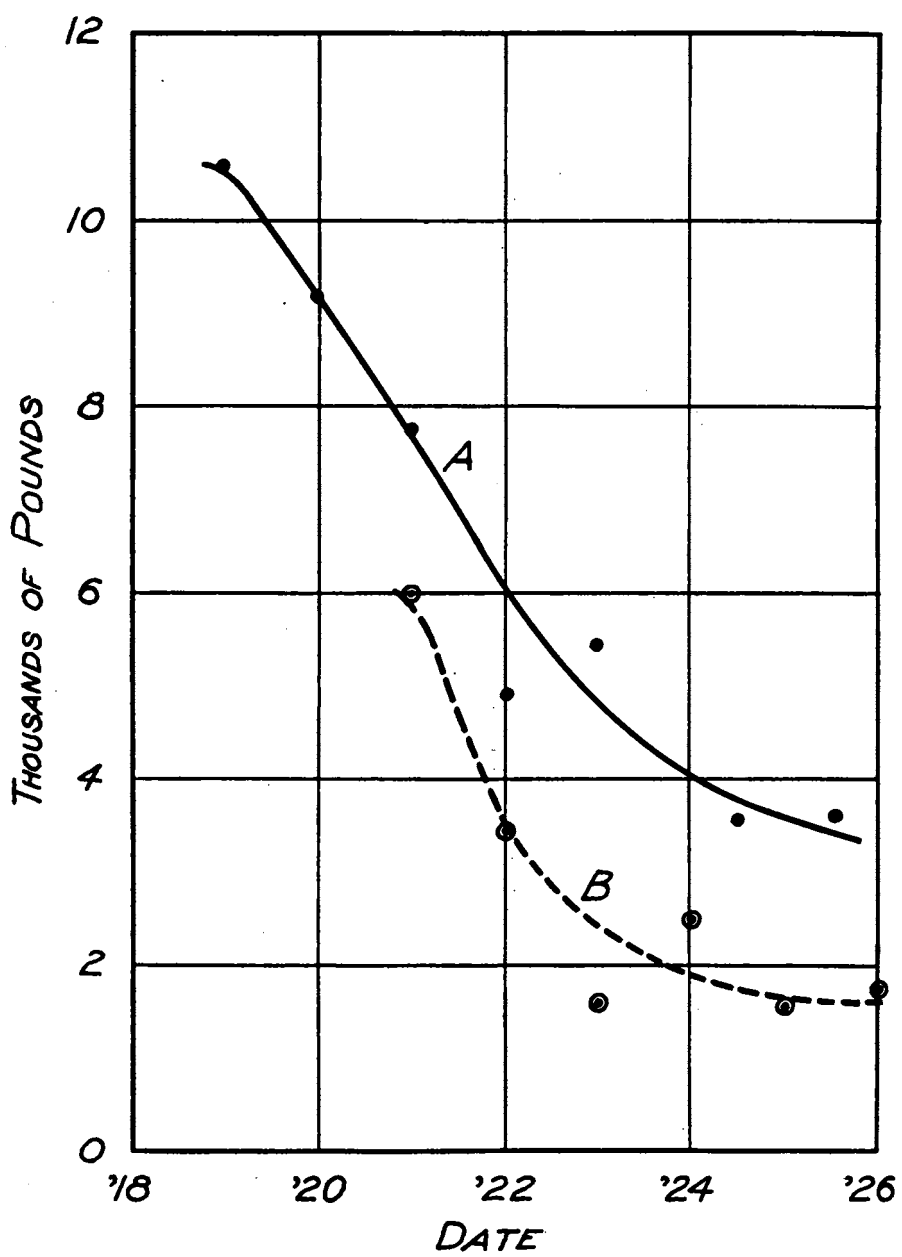
In late months the bag limit has become more necessary for another reason. Under the present law it has become very difficult to prevent illegal canning. Since it is not profitable to can clams in small quantities a bag limit would help to stamp out this unlawful enterprise which is fostered by the present clam code.

In recent years the number of diggers employed by the razor clam canneries has greatly increased. For comparison one may cite the figures for the years 1916 and 1926 in which 347 and 1449 licenses respectively were issued. In table No. 3, it is seen that in spite of the four-fold increase in diggers during the ten years, less than one-half as many clams were reported. In graph No. 7, line B, is graphically represented the decrease in the average weight of clams per digger reported by the cannerymen.

In the construction line B of Graph 7, the total catch was divided by the total number of diggers to obtain the average catch per man. This procedure is open to criticism due to the large number of new diggers coming in each year. In order to obtain a more accurate picture of the success of the effort expended by the diggers the records of 19 individuals were taken. Each of these were men whose digging records covered a period of ten years or more. If the beach were equally productive, each year would show a slight increase over the former due to the greater experience of the diggers. The results are shown in Table 4 and graphically in Graph 7, line A. There is an annual fluctuation due to the weather conditions but the trend of the whole obviously indicates a great decrease in the success of the effort put forth by men engaged in digging. It is evident from Graph 7 that the experienced diggers secure more clams than the general average. This is especially noticed during the poorer season when the average catch for the selected group of experienced men is twice that of general average. One other observation is apparent; regardless of experience, no one is able to dig as many clams now as in former years. There is regular decrease in the annual catch of each digger which indicates a reduction in the clam population of the beach. The increased number of diggers has prevented a great decrease in the clam packs. This steady rise in the number of diggers shows conclusively that the clam population of the beach is decreasing at a rapid rate. Although the clams appear to be quite numerous the figures show that, compared with former years, only a few are taken. Since the amount of digging effort for any given area of beach is increased every year, small clams are taken in larger numbers until more than one-half of those taken during the last two years have not spawned.

Up to a certain limit the pack may be maintained by the employment of more diggers but there will obviously come a time when an increase in the number of men will not offset the decreased abundance of clams and the pack cannot be maintained. Such a state of affairs is being rapidly approached on the Washington beaches.

The real effect of the 1923 set showed up in March, 1927, when they formed the bulk of the commercial catch. It is the success of this one year's set which has maintained the catch during the present biennium. In Table No. 2 is shown the relative number of clams of each age found



in a large sample of shells taken from the cannery shell piles. About one-half of the total number (49.1%) are from 1923 class. This illustrates how heavily this class has contributed to the commercial catch, and the condition of the industry without this one successful spawning season can be imagined.

TABLE NO. 1.

AGE	Under 4½ Inches	Over 4½ Inches	Total
1.....	2.5	.....	2.5
2.....	42.8	0.7	43.5
3.....	3.4	22.7	26.1
4.....	0.7	14.0	14.7
5*.....	0.2	18.0	18.2
Total.....	49.6	50.4	100.0

* Including all older specimens, also.

Table 1.—Table showing the size and age of the clams taken in the commercial catch at Copalls Beach in the month of April, 1925. (Figures given in percentages of total catch.)

TABLE NO. 2.

YEAR CLASS	Per Cent of Total Catch
1926.....	0
1925.....	8.3
1924.....	22.0
1923.....	49.1
1922.....	11.4
1921.....	2.3
1920.....	5.0
1919.....	0.9
1918.....	0.9

TABLE NO. 3.

YEAR	Number Licenses Issued	Clams Reported By Diggers Pounds	Clams Reported By Cannery Pounds	Clams Per Digger Pounds
1916.....	347	1,306,355	.....	.....
1917.....	294	825,555	.....	.....
1918.....	304	1,685,733	.....	.....
1919.....	470	2,963,219	.....	.....
1920.....	418	3,040,759	.....	.....
1921.....	608	661,889	3,620,484	5,955
1922.....	1,222	2,195,613	4,208,241	3,444
1923.....	1,002	783,991	1,622,737	1,619
1924.....	823	451,259	2,060,272	2,508
1925.....	1,093	538,123	1,719,771	1,573
1926.....	1,449	656,891	2,542,600	1,754

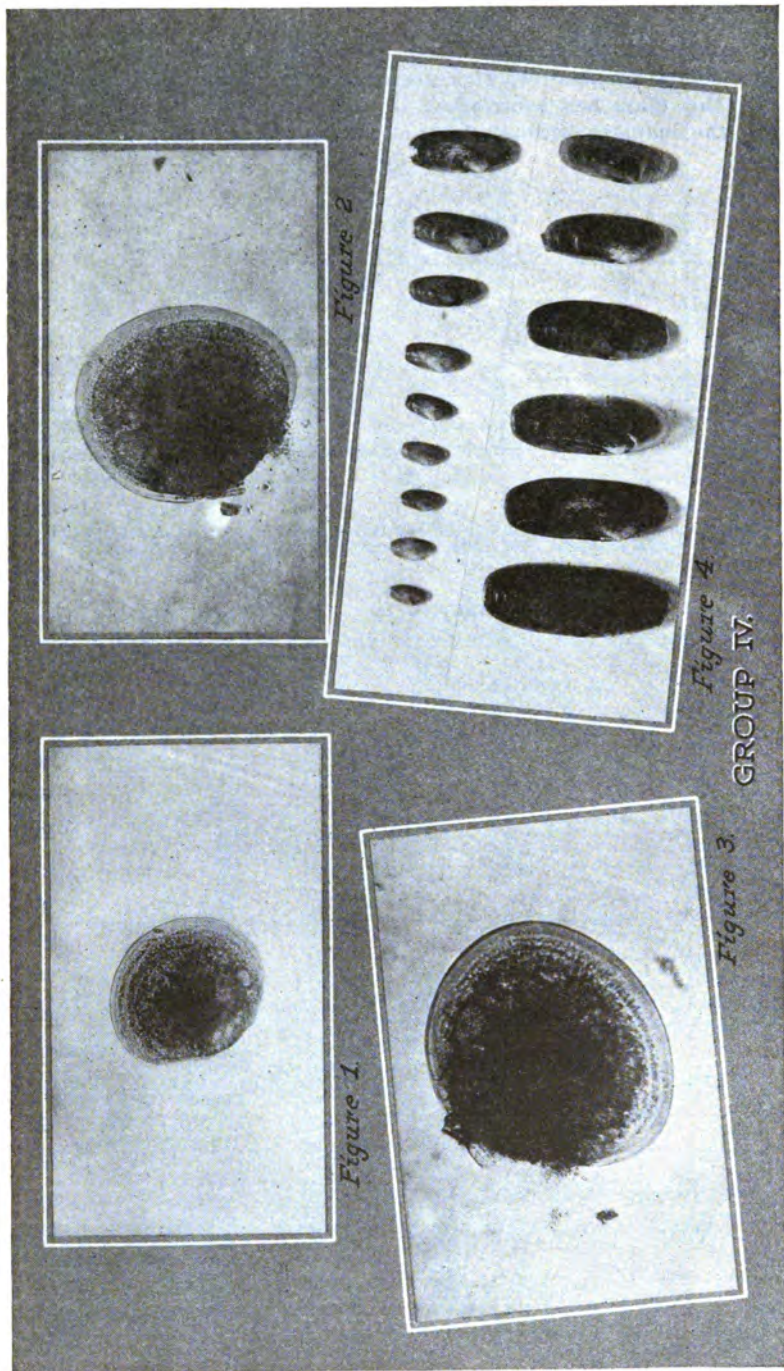


Figure 1.

Figure 2.

Figure 3.

Figure 4.

GROUP IV.

FIGURE 1.—Three weeks old spat. (xL.P.). FIG. 2.—One month old spat. (xL.P.) FIG. 3.—One and one-half months old spat. (xL.P.) FIG. 4.—Small clams: 3 clams 0.4 cm., age 2.3 months. 3 clams 0.84 cm., age 2.7 months. 3 clams 1.10 cm., age 3.3 months. 3 clams 1.55 cm., age 6.0 months. 3 clams 0.60 cm., age 2.5 months. 3 clams 0.84 cm., age 2.7 months. (From McMillin Report, 1924)

TABLE NO. 4.

YEAR	Average Dig Per Man Pounds	Smoothed Value Pounds
1919.....	12,153	10,565
1920.....	12,346	9,177
1921.....	3,093	7,712
1922.....	7,698	4,894
1923.....	3,890	5,457
1924.....	4,782	3,543
1925.....	1,957	3,578
1926.....	3,995	

EXPLANATION OF GRAPH 7.

The smoothed values of Table No. 4 are plotted in line A. These smoothed values are the averages of three years; that is, the smoothed value for 1924 is the average of 1923, 1924, and 1925. This process removes the minor fluctuations and indicates the trend more exactly.

EXPLANATION OF TABLE No. 4.

Nineteen experienced diggers were selected and their average catch per year was determined. The years 1919 to 1926 are shown. The catch for 1918 was used to obtain the smoothed value for 1919 as indicated in the explanation of Graph 7.

THE CLAM RESOURCES OF THE PUGET SOUND REGION

By HAROLD W. NIGHTINGALE

The clams of the Puget Sound region are represented by several bivalves, which occur in varying abundance on the beaches and flats of this area. In this report only those clams which are found in commercial quantities are discussed. The following outline indicates the subject headings to be treated:

1. Description of the Genera and Species of Clams.
2. Distribution of the Clams on Beaches and Flats.
3. Local Occurrence and Abundance.
4. The Clam Industry of this Region.
5. Maintenance of the Clam Supply.
6. Conclusions.

GENERA AND SPECIES OF CLAMS.

<i>Scientific Name</i>	<i>Local Name</i>
Saxidomus giganteus Deshayes	Butter, Hardshell and Little Neck clam
Paphia staminea Conrad	Rock, Ribbed or Sweet clam
Schizothaerus Nuttalli Conrad	Horse clam
Mya arenaria Linnaeus	Mud, Soft, or Softshell clam
Cardium corbis Martyn	Cockle (an allied form) associated with the clams

The butter clam, *Saxidomus giganteus*, Fig. 1, possesses a thick shell and resembles the eastern quahaug in outline of the valves. The siphonate extremity of the shell is slightly gaping, permitting the retractile siphons to be seen. The growth lines of this clam are relatively fine and in adult specimens are often eroded. The valves vary in thickness depending in

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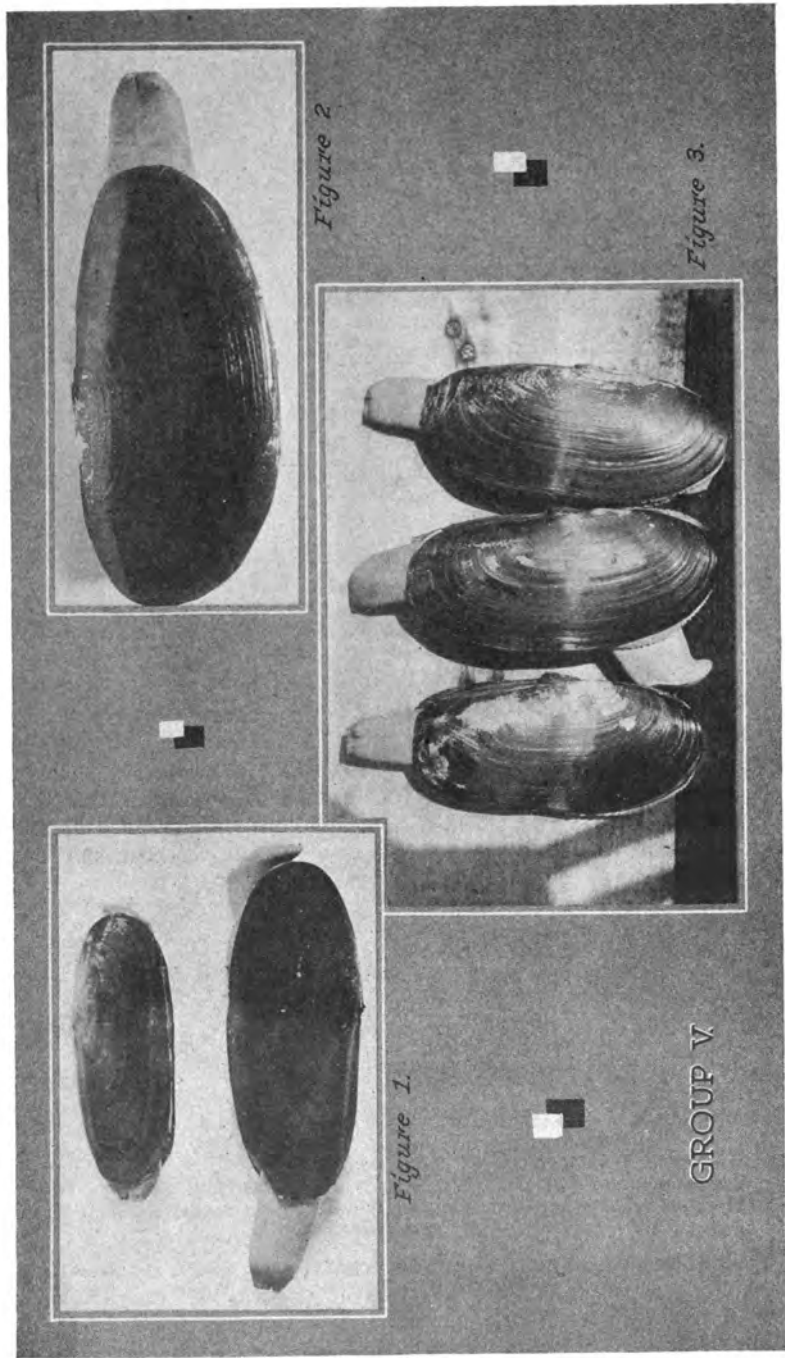


FIGURE 1.—One year and one and one-half year old clams. FIG. 2.—Two and one half year old clams. FIG. 3.—Seven year old clam. (From McMillin Report, 1924)

part upon the age and locality. Wentworth (1921), notes the presence of shells of this species in Bodega Bay, California, $\frac{1}{2}$ " thick by 9" long. In the present investigation specimens from an old Indian shell mound near Birch Point, Washington, measured $\frac{1}{4}$ " thick by 6" long. Enormous quantities of shells of *Saxidomus* were found in this mound which was 5-6 feet thick and 50 yards long. The color of the valves varies in living specimens in this region from white to a bluish grey, owing to the influence of the soil.

The foot is quite strongly developed thus enabling the clam to burrow away from wave action even on gravelly shore. The siphons are not long, in specimens measured, they extended for about 6-8". This length is sufficient to enable the clam to adjust itself to diverse environments.

Although *Saxidomus* is capable of closing its valves quite tightly, it does not hold its fluids well enough to stand exposure out of water for more than a very few days. The valves soon gape open, causing the meat to dry out and to subsequently spoil. Packers of butter clams will not



Four Puget Sound Clams Commonly Found, Also Cockle.

risk holding an oversupply for more than a day or two during the canning season on account of this fact.

The rock clam, *Paphia staminea*, Fig. 2, is a smaller clam than *Saxidomus*. The length of the valves of adult specimens is not usually over $2\frac{1}{2}$ ". The shells are readily distinguished from the butter clam by the presence of radiating lines, which are clearly defined even in young specimens. In certain localities brown markings called chevrons appear on the shell of the rock clam. The rock clam is very frequently confused with the butter clam by the uninformed.

Owing to its small size it is more expensive to handle for canning than is *Saxidomus*. Since both species often occur together on the beaches and flats, it is sometimes the practice to buy mixed stock and after separation

from the butter clams, *Paphia* is canned at the same time. The rock clams though small, possess a sweet flavor, while their nectar is especially appetizing. The valves of *Paphia* are capable of being tightly closed, thus enabling the clam to hold its juices for a few days out of water. For this reason, packers can hold over rock clams for several days before canning, if necessary.

The siphons of this species are short and as would be expected, this clam is found near the surface of the ground.

The horse clam, *Schizothaerus nuttalli*, Fig. 3, attains a much larger size than does either *Saxidomus* or *Paphia*. Shells 7 to 8 inches in length have been observed. The valves of this species are relatively thin and easily broken. In color they are white, sometimes stained bluish by muddy soil, and are covered with a brown periostracum in many specimens. The siphonate end of the shell gapes widely, permitting the large muscular siphons to be seen. Since the valves cannot be tightly closed at all points the horse clam does not retain its moisture well enough to withstand exposure for more than a day or so out of water. To be utilized for canning purposes it would have to be handled without delay. If this species is used in the future for canning purposes, it is probable that live boxes or wells will be useful to keep the clams alive for a few days before canning in the event of an oversupply.

The foot of the horse clam is not large in proportion to the body parts and does not appear to be utilized to any extent by the adult. The siphons of this clam are very active and permit the clam to attain a depth of from 2 to 2½ feet in the burrows examined during this investigation. When the water has covered the flat it is a common occurrence to observe the siphons extended for a height of an inch or more above the level of the ground.

The eastern soft clam, *Mya arenaria*, Fig. 4, is locally known in the Pacific Northwest as the "Mud Clam" although it is not as a rule found in muddy soils in the Puget Sound region—hence the name is a misnomer.

The shells or valves which are thin and somewhat fragile, possess a relatively oval shaped outline. They attain a length of over 5" occasionally, although sizes of 3" are by far the most common in this region. The siphonate ends of the valves slightly gape, permitting the retractile siphons to be seen at all times. The ends of the valves at the anterior extremity of the clam are also somewhat gaping. The outer sides of the shells vary in color from white to a bluish grey. Occasionally the thin periostracum which partly covers the outside of the shell is stained a rusty brown. Soil action through acids and other components accounts for a considerable portion of the color of the outside of the shell.

The siphons are capable of sufficient extension to enable the soft clam to burrow down to a depth of about one foot, (the depth of course being governed by the tenacity of ground—the presence of rocks, etc.,) by the time that adult size is attained. The young soft clams possessing very short siphons are found close to the surface. The siphons are covered with an epidermis in both the young and adult stages of life. In the adult the siphons are very muscular and are black in color at their unattached extremities.

The soft clam is a hardy species and ships well. When shipped in the shell care must be taken not to break the valves by rough handling, since the clam spoils rapidly if its fluids are lost. This clam is not yet used commercially in the Puget Sound region, although canned soft clams are shipped from New England to Seattle at the present time. The meat of the soft clam is appetizing and nutritious. It is highly esteemed on the New England coast where a large and increasingly important canning industry now exists.

The cockle, *Cardium corbis*, Fig. 5, although not strictly speaking a clam, is closely related to them. It is an active bivalve of very common occurrence in the Puget Sound region.

The shells are characterized by numerous radiating ribs and when observed from the anterior and posterior extremities, possess a heart shaped outline. The color of the outside of the valves is variegated but essentially brown. The valves are capable of being tightly closed, enabling the bivalve to hold its fluids when out of water. The cockle has no siphon tubes.

The foot is well developed and powerful, thus enabling the cockle to withstand tidal action in somewhat unstable soil, even though the valves lie close to the surface of the ground. The valves are often scarcely covered by the sand. The sign or siphon hole in the sand which identifies the presence of the cockle is often double, and is surrounded by a saucer like depression. The cockles' presence on the bare flat can often be spotted by the spouting which occurs when they eject sea water.

The cockle is not utilized for food in this region, it being claimed by local residents that it is tough and strong in flavor. Indians locally use a few when other species are not available for food purposes. If properly cooked the cockle has a good flavor and should be utilized for food purposes in this region. According to Weymouth, Bulletin of California Fish and Game Commission, dated 1921, page 28, "An excellent food mollusk, commanding a good price in the market, it is not handled commercially in California because of its scarcity." For the same reason there is little local use made of it.

Distribution of the Clams on the Beaches and Flats.

The clam species outlined in this report usually show a definite zonal distribution on the beaches and flats. A typical clam beach exists at Indianola Beach, Kitsap, Puget Sound. The soil varies from gravel to sand.

The zone on the beach line from high water (+11 to +12) down to the line corresponding to +4 tidal elevation is rocky gravel with an admixture of silt and clay. At +4.5, the highest point on the beach at which clams occur, is found the soft clam, *Mya arenaria*. Between +4.5 and +3.8, rock clams exist in some places mixed with the soft clams. The width of the gravel zone in which clams occur is very small not being over about 20 feet in most places.

The sand zone which begins abruptly at about +4.0 and extends beyond -3 tidal elevation, is composed of sand containing an admixture of cementing clay and silt. This soil is less stable than that of the gravel zone since no pebbles nor gravel are present. During southerly winds of the rainy months the sand may shift under the action of waves upon the shore.

Horse clams and cockles are generally distributed throughout all elevations in this sandy area.

Arranged in the order of their occurrence on this beach the clams appear as shown in the following elevation data.

The clams in both zones have become adapted to stable or unstable soil conditions depending upon the species. The conditions observed at Kitsap are modified in certain localities in the Puget Sound region by the presence of outlying gravel bars and flats. On such areas butter clams as well as rock clams which often occur together, may extend from +2.5 tidal elevation down to -3 on the lowest run out of minus tides. The soft clam occasionally occurs down to +2.5 but as a rule ranges high up on the beaches. This fact was observed by Kincaid in 1917-18 in a clam investigation made for the State Fisheries Department.

In localities where no sand zone occurs between the highest and lowest or minus tides, the gravel zone is often of a relatively sharp or steep slope. On such a beach butter and rock clams often occur at the lower levels between -2.5 and -3.0. A diagram of such a beach is shown below; it is typical of Hoods Canal.

Beaches of coarse sand with an admixture of pebbles acting as a stabilizer sometimes support butter and rock clams.

Local Occurrence and Abundance on the Beaches and Flats.

The following Table 1, indicates the local occurrence and relative abundance of the clam species discussed in this report, during the summer of 1925.

Relative abundance is expressed by 4 numbers. Absence (0) indicates that observations failed to show the presence of the clam in question in the area examined. Scarcity (1) indicates that an occasional clam was found within the area. Present (2) indicates occurrence in isolated or restricted areas. Moderately abundant (3) signifies considerable numbers not completely covering the area. Abundant (4) denotes larger numbers of clams over an extensive area.

Owing to the fact that the actual abundance of any one clam in terms of its presence in numbers per square foot varies greatly with the several genera and species—it has been found more satisfactory to show relative instead of actual abundance throughout the large region inspected. Furthermore, intensive studies in limited localities would be necessary before the numbers of clams per acre could be ascertained.

Observations concerning the usual rate of actual numerical occurrence have been made in portions of all the localities examined. The purpose of the figures given in Table 11, is to furnish a working basis for later studies and to indicate the usual numerical rates. These figures are given both for the adult and market sizes of clams as well as for seed clams. The term "seed" signifies young clams ranging from an age of a few months up to one year, depending upon each particular species and its rate of growth.

TABLE 11.

Variety of Clam	Usual Rate of Occurrence Adult and Market	Seed
Butter.....	0-3 per sq. ft.....	0-6
Rock.....	0-5 per sq. ft.....	0-10
Horse.....	0-2 per sq. yd.....	0-5
Soft.....	0-50 per sq. ft.....	0-100
Cockle.....	0-3 per sq. yd.....	0-6

TABLE 1.

LOCALITY	VARIETIES				
	Butter	Rock	Horse	Soft	Cockle
Puget Sound—					
Kitsap	1	3	4	1	4
Port Madison	3	2	0	2	0
Rolling Bay	1	2	2	2	2
Foulso	3	2	0	1	0
Port Susan—					
Camano Head	4	3	1	0	1
Birmingham	3	3	0	3	1
Saratoga Passage—					
Oak Harbor	3	3	0	0	0
Coupeville (near)	3	3			
Skagit Bay—					
Padilla Bay—					
March Point	3	3		1	0
Anacortes	0	0	0	0	0
Guemes Id.	3	3			
Samish Id. (south side)	1	1	0	2	2
Samish Bay—					
Samish	0	1	0	1	0
Edison	0	0	0	0	0
Samish Id. (north side)	3	4	3	2	3
Chuckanut Bay—					
Bellingham Bay—					
Maretta	0	0	0	2	0
Lummi Reserve	3	2	1	3	1
Georgia Straits—					
Lummi Id. (east side)	3	3	1	0	0
Sandy Point	3	2	0	0	0
Birch Bay	4	4	4	4	4
Semlahmoo Bay	1	1	3	0	2
Drayton Harbor	0	0	0	1	1
Hoods Canal—					
Foulweather Bl. (south side)	2	2	4	1	4
Hoods Head	2	2	2	3	1
Port Gamble	2	2	3	1	2
Squamish Harbor	2	2	3	1	4
Lofall	3	3	0	1	1
Bangor	3	5	0	0	0
Dabop (east)	4	4	1	1	2
Quilcene Bay	3	3	0	2	1
Jackson Cove	3	3	1	3	1
Brinnon	3	2	1	1	1
Triton Cove	2	2	1	1	1
Eldon	2	2		1	0
Lilliwaup	2	3	1	1	1
Dewatto	2	2	0	1	1
Hoodsport	2	2	0	1	0
Potlatch	0	0	0	1	0
Union City	2	3	0	1	1
Happy Hollow	3	3	0	1	0
Lynch Cove (Belfair)	2	3	0	4	0

Key 0—absent 1—scarce 2—present 3—moderately abundant 4—abundant

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The figures indicate that the seed and adult sizes of the soft clam occur numerically at the highest rate per unit area. The horse clam and cockles show the lowest rate, with butter and rock clams occupying an intermediate position. It is also to be observed that on the basis of the above figures a much greater acreage would be required to support an equal number of horse clams and cockles than would be necessary under natural conditions of setting, for an equal number of soft, butter or rock clams.

With the information contained in tables 1 and 2 at hand, the local occurrence and abundance of clams in each of the localities will be discussed.

Puget Sound.

Kitsap—The beach from Miller Bay to Jefferson Head was inspected and found to contain considerable numbers of horse clams and cockles in the lower or sand zone. In the upper or gravel zone rock clams occurred in abundance together with small numbers of butter and soft clams. This beach appears to be ideal for horse clams and cockles on account of the location and broad expanse of sand fiat at low tide. The gravel zone is narrow and offers but a limited area for the establishment and growth of other varieties. Upon screening the soil of the sand zone, a small number of soft clam seed was found. It is probable that these seed were washed inshore until they reached the more stable ground in the gravel zone. A few adults of this species were found in the sand zone, the shells of which were closely similar to the soft clam when found under like soil conditions in eastern waters. The beach at Kitsap and vicinity would be ideal for culture studies of the several clams observed there.

Rolling Bay: Bainbridge Island.

In this locality the gravel zone contains isolated areas in which rock, butter and soft clams are found. A projecting gravel bar extending for a considerable distance on minus tides contains butter clams. Horse clams are found in limited numbers.

Port Madison, Bainbridge Island.

Butter clams were found occurring in moderate abundance on the gravel beaches of Port Madison. Rock clams were less abundant.

Dogfish Bay, Poulsbo and Vicinity.

The gravel beaches of this bay were found to contain butter clams in moderate abundance with lesser numbers of rock clams and somewhat smaller numbers of soft clams. On account of the proximity to Seattle—a shipping business of fresh clams is carried on by boat during the open season.

Other points in Puget Sound south of Port Madison and Poulsbo were not examined on account of lack of time.

Port Susan.

Camano Head—The southern end of Camano Island and Port Susan contain gravel beaches which show the presence of considerable quantities of butter and rock clams. When viewed from the south at low tide, Port Susan's large flats give an observer the impression of extensive clam beds.

Large areas covered with sea grass and soft sandy mud constitute the greater part of the flats. This mud is exceptionally soft and no clams are found in it. The only marine organisms inhabiting the soft mud are marine worms whose burrows occur in enormous numbers. A considerable portion of Port Susan is influenced by silt and mud from the Stillaguamish River which empties into it near East Stanwood.

Near the eastern shore of Port Susan the seaweed disappears, but the sandy mud persists until about +3 tidal elevation is reached. Near Birmingham the sandy mud at +2 to +4 was found to contain considerable numbers of seed of the soft clam. As many as 25 per sq. ft. were observed in the screen. The size of this seed on July 9th was from 1/16—1/8" indicating that the soft clam in this locality had probably spawned about a month prior to this date. This opinion is based on growth data in waters of similar temperatures in New England. Further studies would throw more light on this matter. The seed clams became more numerous as the gravel bars at Warm Beach (Birmingham at +5) were reached. As high as 100 seeds per sq. ft. were observed. The soil on these bars consisted of a gravel mixed with sand clay affording a stable foundation and foothold for the young soft clam. The seeds were observed during several flood tides to be washed inshore from the soft soil onto the gravel bar.

In the gravel zone, considerable numbers of adult soft clams were found ranging as high as 50 per square foot. No other clam species occurred on the gravel bars close to Warm Beach.

Proceeding southerly from this town towards Kayak Point there are gravel zones on the beach at about +3 tidal elevation for a considerable distance along the beach. Butter and rock clams are numerous, in many places occurring at the rate of 2—3 to a square foot.

Above Warm Beach toward East Stanwood soft sandy mud exists, and as a consequence, no clams are found in this part of Port Susan. On the opposite side at Livingston Bay and near South Pass a few butter and rock clams are found.

Saratoga Passage—Whidby Island.

Several points on this island were examined. At Oak Harbor, flats of a considerable acreage prevail. A large portion of these flats are composed of a loose, watery, sandy mud, dotted with the burrows of worms. No clams were found in this unstable soil.

The gravel zone about the harbor contained a few soft clams, while inside the spit butter and rock clams prevailed. In general, conditions were somewhat similar to those obtaining at Port Susan. Near Penn Cove and Coupeville the gravel beaches contained appreciable quantities of butter and rock clams. On the west side of Camano Island in Saratoga Passage considerable rocks prevail, and there are very few clams of any species on the beach.

Skagit Bay.

Proceeding northward from West Pass into Skagit Bay, shoal water and soft mud prevail on the eastern shore; the influence of the Skagit River in this bay is considerable. Few, if any, clams exist on the eastern side. On the west side, along the shores of Whidby Island, gravel and sand beaches again prevail, with scattering beds of butter, rock and soft clams. In the direction of Swinomish Slough a moderate quantity of butter and

rock clams occurs at Oak Island. The soft mud and unstable sand prevail through Swinomish Slough and very few clams of any species exist near or in the Slough. The tidal currents cause shifting bottom conditions over a considerable territory in Skagit as well as in Padilla Bay.

Padilla Bay.

This bay is also shallow and possesses soft muddy soil over the eastern portion. Padilla Bay in the portion east of a line between Hat Island and Swinomish Slough is not suitable for the development of clams. In the event of the completion of the proposed dyke most of this ground will become dry land.

On the western shore of this bay and adjoining Fidalgo Bay, moderate quantities of butter and rock clams occur at March Point where stable soil conditions prevail. Near and at Anacortes, soft soil and pollution undoubtedly accounts for the lack of clams. Across to Guemes Island at North Beach, butter and rock clams are found.

Proceeding to the northeastern end of Padilla Bay, on the south side of Samish Island, a few soft clams exist as well as a limited number of butter clams at the extreme end of a spit projecting from Samish Island towards Hat Island. The butter clams may be obtained on this spit when the tide runs below +3.

The several islands in Padilla Bay, Hat and Saddlebag are very rocky and have practically no beach line.

Samish Bay.

This bay is shallow and much seaweed and soft sandy mud prevail; the influence of the Samish River is marked throughout the bay. On the eastern side near Edison, Blanchard and Samish Station few clams of any species prevail. The flats in the middle of the bay are also of soft ground.

At the western end of the bay the flats on the north side of Samish Island contain a variety of clams in considerable abundance. A projecting gravel bar on the northeast end of this island between +1 and +3 contained considerable soft and butter clams. The gravel contained an admixture of blue silt which stained the shells of all these clams a bluish grey. As many as 20 soft clams and 2 butter clams per square foot were found on this bar. Proceeding along the beach towards Point William, large sand flats occurred between -2 and +3 tidal elevation on which horse clams and cockles were found in varying abundance. This beach is exposed to northerly winds in the winter which no doubt cause the sand to shift. The gravel zone of the beach towards Point William contains a considerable number of rock clams with a smaller quantity of butter clams. These clams exist between +2 to +4. The gravel zone in which rock and butter clams occur widens at and near Point William and considerable numbers of these species are found.

On account of the number of varieties of clams found on the north side of Samish Island this locality is of considerable interest and would undoubtedly be a useful locality for more intensive study.

Chuckanut Bay.

Chuckanut Bay which lies north of Samish is an example of an enclosed area having deep water and very little beach line at low tide. Scattering

clams may be found at the northern end but the findings in this bay are negative as would be expected from the rugged rocky formation.

Bellingham Bay and Channels.

The clam findings at and near North and South Bellingham are negative for all species. Between Marietta and the southern end of Lummi Indian Reservation the Nooksack River influences the soil and considerable soft mud exists. The muddy flats on the south side of Lummi Indian Reservation contain moderate quantities of the soft clam. An interesting observation was made during the inspection of this locality. Hogs were observed rooting after the soft clams embedded in the ground.

On the west side of Lummi Reservation bordering Hales Passage, the gravel beach and spit near Gooseberry Point contain on low tides a considerable number of butter and rock clams.

Lummi Island.

The eastern shore of this island which lies across Hales Passage contains gravel beaches. In fact the shoreline from the southeastern end of Lummi north to Beach contains at low tideline varying quantities of butter and rock clams. Indians formerly procured butter and rock clams in considerable numbers on this beach line for the Bellingham market.

Georgia Straits.

Proceeding north towards Sandy Point scattering numbers of butter and rock clams exist. Here gravel beaches are found. On the west side of Sandy Point butter and rock clams occur in considerable quantities. In localities somewhat inaccessible to clam diggers and the public, the clam beds are very well stocked.

North of Sandy Point to Point Whitehorn the beaches are rocky and exposed. Inspection shows the absence of clams.

Birch Bay.

This bay is an open bight extending from Point Whitehorn on the south side to Birch Point on the northwestern. The bay is exposed to northwest winds but is protected by Point Whitehorn from southerly winds. The bay is shoal and contains a considerable expanse of flats at low tide. A large variety of soil exists here in which many clams of all varieties mentioned herein are found.

Birch Bay is somewhat semicircular in outline and on minus tides exposes nearly a mile's width of flats between +2 and -3 tidal elevation. This width occurs at about the middle of the semicircle and narrows considerably as the points at the extremities of the bight are approached. The slope of the beach near and at the points is sharp.

The sand zone of the flats extends from about -3 to +2.5 except at Cottonwood Beach where the sand is replaced by clay. This zone narrows markedly as Whitehorn and Birch Points are reached until only a narrow strip exists at their extremities. The gravel zone extends upward from +3.5 in many places, although gravel bars in some parts of the bay extend as low as +2.0.

The lower sand zone contains a considerable number of horse clams and cockles. The horse clams have been somewhat thinned out during the

past few years by transient diggers and although conditions for the growth of this large clam are apparently ideal, they are found only in patches. The horse clam occurs in portions of the sand zone exposed only on minus tides to the extent of 1—2 to a square yard. The cockles which are not dug as a rule, are more abundant, in some places ranging from 2—3 to a square yard. In certain parts of the sand zone the seaweed covering has apparently checked the digging, since all transients are not equally adept in finding the clam signs or burrows. A large area of stable sand, containing enough clay to act as a cementing substance, exists in Birch Bay.

The gravel bar in about the center of the arc of the semicircle and extending upwards from about +2.5 contains large numbers of butter clams at the lowest point, that is, +2.5. Above the butter clams are found rock clams and higher up at about +3.5 are found large numbers of soft clams. On days showing a slack low tide say +4 or more only soft clams can be dug unless underwater digging be resorted to. The seeds of the soft, rock and butter clams were numerous throughout the bar. As many as 50 per square foot of the soft clam seed and 5 or more for the rock and butter clams were observed in screening experiments. The seed of all species were very small, the inspection having been made in July, not long after spawning. The gravel zone toward Point Whitehorn contained large numbers of butter and rock clams covering in length a mile or so of beach line between about +1 and +3. The butter and rock clams near Point Whitehorn are embedded in very firm gravel studded with pebbles. The gravel beach near Point Whitehorn is not frequented by as many transient diggers as is that near the two summer resorts and apparently has not been dug over to any great extent. Several butter and rock clams per square foot inhabit the beach near the above point.

On the opposite shore near and at Birch Point, coarse sand interspersed with pebbles occurs. Rock and butter clams occur in considerable numbers in this firm ground. Very few clam diggers visit this point. The enormous shell mound at Birch Point, of Indian origin, appears to indicate that large numbers of butter, rock and horse clams have been dug on this bay in the past.

Since the acreage of Birch Bay is large and clams are numerous in certain portions of it, an intensive study concerning methods of maintaining a future supply by restriction or by cultivation would undoubtedly yield interesting and valuable results. It appears that ideal conditions for the existence and growth of clams in this bay obtain. Temperature measurements indicate water as warm as 22.0° C. or 71.6° F. during the summer months and microscopic life in the water is especially abundant.

Blaine: Semiahmoo Bay.

In this bay, which is located near the boundary, a sand spit extends out from the lighthouse and on minus tides moderate quantities of horse clams are found. On the eastern side of this bay at Blaine a muddy soil prevails and no clams are found in appreciable quantities.

Drayton Harbor is largely composed of mud flats covered with seaweed and for this and other reasons few, if any, clams are to be found there. Creeks enter this harbor and although in the past oysters existed there, it has not been a clamming region as far as the writer can ascertain.

Hoods Canal.

This territory is of particular interest both on account of its size and variety of soil conditions. Large numbers of butter, rock, horse and soft clams occur within the Canal.

The beach directly inside of this strip of sand is composed of gravel and sandy clay. The gravel zone contains rock and soft clams in small quantities. Below the gravel, mud occurs in which no clams apparently occur.

Shine (A Small Settlement)

Proceeding down the Canal for several miles, the beaches at Shine contain a few rock and butter clams but the lower or sand zone contains considerable cockles and horse clams.

Lofall and Vinland.

On the opposite bank of the Canal gravel beaches obtain from Port Gamble south to Lofall and Vinland in which at low tide, from -3 , $+2$, commercial quantities of butter and rock clams are dug. The beach line is relatively short and steep along the canal at these places.

Bangor.

The beach line at Bangor is similar to that above Lofall—gravel and rocks prevail. This region contains considerable numbers of butter and rock clams. The beach in places is littered with empty shells of both these varieties. The beach for about a mile in length at and near Bangor has been bought from the state by a resident of Bangor. This purchase covers the beach down to extreme low tide and is used as one source of clams for the cannery. At the present time this portion of the beach is somewhat depleted but may possibly reseed itself within a few years. Butter clams are especially numerous in certain localities at the northeastern part of the Canal.

Dabop Peninsula (East Side).

On the opposite bank of the Canal on line with Bangor, gravel beaches containing butter and rock clams in moderate abundance occur. These clams were dug by the writer at a low tide of $+1.9$. The range of these clams appears to be from -3 to $+2.5$. For this reason slack tides would not permit digging. During most of the winter months night digging must be resorted to here in the Canal as well as in other localities of the Puget Sound region.

Quilcene.

This bay contains a large expanse of flats which are of a dangerously soft sandy mud in certain parts. This mud contains many burrows of worms, as well as a mat of seaweed at low tide levels. The big and little Quilcene Rivers empty into this bay and undoubtedly have caused the considerable deposition of silt and clay. At the northern end of the bay a few soft clams inhabit the gravel zone which lies above the soft mud. No other clams appear to exist at this end of Quilcene Bay from the mouth at Foulweather Bluff to Belfair in Lawson Cove at the southeastern end.

Directly inside Foulweather Bluff gravel and sand beaches occur. Moderate quantities of butter and rock clams occur at the gravel zone while large quantities of horse clams and cockles are found in the sand flats below. The flats at the mouth of the Canal have apparently been very little

dug over in recent years at least, possibly due to their relative inaccessibility to clambers.

Port Gamble.

The shoreline within this bay is relatively steep and at low tides especially minus tides, horse clams are found in moderate numbers in the sand zone. Above the sand a few soft clams occur.

Hoods Head.

This promontory which appears as an island from the mouth of the canal is connected by a strip of low ground to the mainland. Towards the mouth of the bay on the eastern side gravel beaches occur at Harmon Point in which butter and rock clams are found in moderate abundance.

Jackson Cove.

This cove which lies south of Quilcene Bay contains a broad expanse of flats in proportion to the size of the cove. The gravel zone is broad and at the highest elevations, about +4 to +2, a considerable number of soft clams, about 10 per square foot are found. The seed of this specie is also abundant. The soil appears to cause little or no coloration to the shell of these soft clams which are white in color. Occurring at the same elevations large numbers of seed rock clams were observed. Their rate of abundance usually ran from about 5—10 per square foot. This set of rock clams was unusually abundant. At the lower line of the gravel zone a few butter clams existed but not in commercial quantities. Residents of the cove ascribe this condition to the dug out condition of the bed of clams. Difficulty was experienced by a clammer in procuring one 120 pound sack of butter and rock clams per tide on this cove at the time of the writer's visit. On minus tides horse clams are found in moderate quantities.

Brinnon.

The flats about this town are considerable in extent varying from gravel to sand at the lower levels. The lower or sand zone contains horse clams which are widely scattered throughout the flats. Near Brinnon the narrow gravel beach at Duckabush yields moderate quantities of butter and rock clams.

Seabeck.

Beds of butter and rock clams are found generally distributed between Seabeck and Bangor.

Triton Cove.

This cove which lies down the Canal from Duckabush contains moderate quantities of butter and rock clams within the gravel zone and a few scattering horse and soft clams as well as cockles. Its area is not, however, sufficient to yield very large quantities of these bivalves.

Lilliwaup.

At this town the gravel beaches contain largely rock clams with a smaller number of butter clams at the lower margin of the gravel zone. On minus tides scattering horse and soft clams as well as cockles are found. As a clamming ground, Lilliwaup is a small producer.

Dewatto.

At this town a somewhat larger area of flats obtains than across the Canal at Lilliwaup. At Dewatto clammers obtain moderate quantities of rock clams and a smaller number of butter clams.

Hoodsport and Potlatch.

The gravel zone at Hoodsport contains only scattering clams while at Potlatch practically none are found. A silty mud, derived no doubt from the Skokomish River, influences conditions at Potlatch and renders them unsuitable for the existence of clams.

Union City.

Both gravel beaches and muddy flats obtain at and near this town. At the southwestern end of Union City considerable silt and clay derived for the most part from the Skokomish River renders conditions unfavorable for the growth of butter and rock clams; however, a limited quantity of soft clams occur here.

Proceeding about easterly from Union, gravel beaches containing rock clams in moderate abundance exist. Butter and soft clams are of less common occurrence.

Happy Hollow.

At and near this settlement which lies on the Union City side of the Canal, gravel beaches occur. The lower elevations of these beaches contain rock and butter clams in appreciable quantities. The soil is quite free from river silt in this vicinity.

Lawson Cove: Belfair.

After leaving Happy Hollow the water becomes progressively shallower until in Lawson Cove at the end of Hoods Canal considerable soft mud is encountered. On the shore about Belfair, the flats are of considerable width. The mud is not deposited to any considerable extent on this side of the Canal and gravel sand flats are in the majority. The gravel is deposited in bars near low tide level. Soft clams occur in these flats in considerable quantities. Moderate quantities of rock clams occur at points lower on the beach than the soft clams. Isolated patches of butter clams are found but in small numbers.

Aside from the oyster farms at this point, the soft clams are by far the most numerous shellfish present. These clams also occur on Lawson Cove along the beach opposite from Belfair. The seed is very numerous throughout the gravel zone. Examination of these flats shows the presence of a closely related species to the common enemy of soft clams in eastern U. S. waters. It is called the snail in this region but is misnamed the cockle in eastern waters. The extent of its depredations on oysters in this part of the Canal is well known, but not in connection with the destruction of clams.

Observations on the conditions of life of the soft clam in Lawson Cove show the presence of dwarfed and deformed specimens where the soil is intermingled with dense aggregates of small pebbles. Such clams if located in a more suitable soil would undoubtedly attain a larger size in a shorter time. In the loose gravel-sand soil near Belfair much better conditions for larger sized soft clams obtain.

The extreme end of Lawson Cove is an area composed wholly of soft mud and marshes, which conditions are not suitable for the existence of clams.

Taken as a whole the Hood Canal region with its long line of gravel beaches contains many acres of clam beds. On slack low tides very few clams of any variety can be procured. This condition, however, does not materially interfere with the industry since at certain times night digging is resorted to.

The butter clams in the Canal are most numerous at points above Seabeck, while below the Dabop Peninsula and towards the end of the Canal, rock clams take the lead in numbers.

The Clam Industry.

The clam industry of the Puget Sound region comprises both the fresh and canned trade. The butter and rock clams are the only species occurring in commercial quantities that are sold in the markets.

Fresh Clams. Aside from transient digging of butter and rock clams during the summer months for local consumption by campers and tourists these clams are shipped in the shell during the fall, winter and spring from the clam beds to nearby cities. As would be expected, this trade is largest in and out of Seattle. Butter and rock clams are often sold mixed and are most commonly shipped in burlap sacks. The clams in each sack usually weigh about 115 pounds-120 pounds. The unit of measurement appears to be a 5 gallon oil tin, 3 of which full of clams would equal about one burlap sackful. Two 5 gallon oil tins are said to make one bushel but this unit is not at all common in the Pacific Northwest.

The fresh clams are not shucked out until after reaching the wholesaler or retailer in the city. Near Port Orchard a live car is used to hold clams prior to shipment to Seattle as shell stock. This method of holding clams alive is of common occurrence on the Atlantic Coast but is very uncommon in this region. Small quantities of fresh shell stock are shucked and shipped in tins surrounded by ice or in parchment containers.

Table 111 shows the extent of the clam industry in the Puget Sound district. Figures on the total catch which include a few mussels are given between dates of 1917-1924, inclusive. Statistics on the pack of clams are given for the period between 1905-1924, inclusive.

Total Catch.

The total catch of 1917 shows an unusually high return with a correspondingly large number of licensed clam diggers engaged. War conditions, no doubt, played an important part in the demand for clams at that time. During 1918 the catch dropped off as well as the number of clammers, only to rise again during 1919. The 1920 catch and the number of clammers engaged shrunk nearly one-half below the return of 1919. Since 1920 the catch has slowly risen as well as licenses issued.

CLAM STATISTICS.

State of Washington Figures—Puget Sound District.

YEAR	Catch	CANNED		Can-neries	Bait	LICENSES	
		Clams	Nectar			Clam	Bait
1905		3,500					
1906		8,850					
1907		8,850					
1908		8,200					
1909		5,000					
1910		8,200					
1911		6,200					
1912		6,000					
1913		8,200					
1914		5,000					
1915 (9 mos.)		875				185	
1916		3,529	15				
1917	1,179,375	19,956	303	3		236	
1918	772,568	7,944	177	4		177	4
1919	925,531	3,738	619	4		232	
1920	488,965	3,524	154	4		145	
1921	385,856	4,810		4		115	2
1922	441,184	5,538	60	4	17,080	121	15
1923	572,306	8,400	515	6	15,500	119	9
1924	554,631	9,366	2,400	4	12,700	132	10
1925							

Key—Catch expressed in pounds. Canned in terms of 48 lb. cases. Bait in pounds.

Since 1922 an appreciable number of clams have been used for bait purposes. In comparison to total catch, however, the poundage is small. The number of licenses for bait clamming has increased during the past few years.

Canning. Data on the quantities of clams which have been canned in the Puget Sound district covers the period from 1905-1924 inclusive.

In 1905, 3,500 cases (48 pounds each) were packed. During the next year this figure rose to 8,850. Between 1906 and 1916, this industry showed considerable fluctation but no definite increase. In 1917 a big increase to 19,956 cases took place only to be followed by a slump to 3,524 cases in 1920. Since that date the return has slowly increased to 9,366 cases in 1924.

The quantity of clam nectar packed is small but it is of recent development and shows a probable future increase.

Since 1917 the number of clam canneries in this district has not materially increased. Four canneries were operated during 1918 and also in 1924. There is nothing to indicate any increased investment by the canners.

It is apparent that the packing of clams in the Puget Sound district has not showed a rapid growth since 1905. In fact the figures in Table III indicate a small but somewhat stable industry.

There are, of course, many factors which enter into the present and future status of the clam packing industry of this region. Among these factors may be mentioned competition from the sale of another variety of clams not found in the Puget Sound district, as well as eastern clams which are now shipped (canned) from the New England states. The cost of producing canned clams is of course also a large factor.

It would appear, however, that future expansion of the clam packing industry in the Puget Sound region will take place.

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Attention should be directed towards the utilization of the soft clam, the cockle and horse clam for canning purposes.

Clam canning in this region according to state figures is carried on at present in four canneries.

During the present survey the writer visited a clam cannery located on Hoods Canal. This cannery had just started on the fall pack for 1925.

Both butter and rock clams are procured and shipped to the cannery in burlap sacks. In each sack is placed about 65-70 pounds of clams usually mixed butter and rock clams. Although the clams are sold by weight, the diggers put into each sack two five gallon oil cans full of clams. This volume is said to be equal to one bushel. The present cost to the canner is \$1.00 per sack of 65-70 pounds plus a state tax of 9c for each 100 pounds of clams in the shell purchased.

The clams are usually picked up by a boat that delivers them to the cannery. Upon arrival at the cannery the sacks are opened and the clams dumped into a large rectangular wooden tank containing fresh water. They remain in this water for two hours or more during which time a considerable portion of the grit, sand and mucous is "spit out" through their siphons.

During this period their valves are tightly closed since the clams are not accustomed to fresh water.

The butter clams are then separated from the rock clams after being removed from the fresh water. A layer of clams of either variety several inches deep is then placed in a galvanized iron tray provided with a large number of openings through which the steam will enter. Several such perforated trays are superimposed upon a water tight tray of similar size. The trays covered with clams are then wheeled to the retort, which is of the salmon canner's type. The clams are then steamed in this particular plant for 20 minutes at 240° F. Three or four of these nests of trays are steamed at once. The valves of the clams open up during this rather rigorous treatment and at the same time the juice or nectar is deposited in the water tight tray at the bottom of each nest.

The trays of clams after removal from the retort are placed upon the tables and the meats at once removed from the shell. This is readily accomplished since the meats have shrunk during the steaming operation. The gills and black siphon tip are sometimes cut off and the clams are packed in No. 1 oyster cans together with hot nectar. The cans are then placed in the double steamer without previous exhausting. Since a cut out weight of 5 ounces of clam meat in No. 1 oyster cans is required by the Dept. of Agriculture standard, a somewhat greater weight of steamed meat must be put into each can, on account of later shrinkage during processing.

The clams are then processed for one and one-half hours in the retort at 240° F. This cooking is undoubtedly severe and must cause considerable shrinkage in the meats.

Both butter and rock clams are canned whole at this cannery. The nectar especially from the rock clam is also canned separately in tins as well as in glass. This nectar is very appetizing and its sale is increasing.

Small packs of clam chowder are put up at present by a cannery in the Port Townsend district. In making chowder very small quantities of clams are required, for this reason when weather conditions are adverse and clams are scarce it is customary in some localities to pack in this manner. This

business though undeveloped in this region is extensive in the New England states.

Maintenance of the Clam Supply.

Broadly speaking, a considerable surplus of clams must remain unmolested in the beds, each and every year above the demands of an ever increasing future consumption—if the supply is to be maintained. The following methods of maintenance must now be considered:

- a. Closed Season.
- b. Cultivation.

a. **Closed Season.** A strictly enforced closed season for clams during and for a period after the spawning season is of unquestionable value. It is evident that the spawning period of all clams under consideration must be definitely known before the limits of a closed season can be fixed to best advantage. The present law in the Puget Sound region closes commercial clam digging each year between April 1 and September 1. According to Kincaid the breeding season of the butter and rock clams begins in March and April. The reproductive elements are not apparently discharged at once but rather gradually. By the time the summer season has arrived, the young of these species have begun their lives as minute shelled organisms on the beaches and flats after a period of free swimming or larval development. The minute clams are at the mercy of the elements since they are close to the surface of the ground. If the beds are dug over during the summer months, these small clams are frequently buried under considerable quantities of soil, a condition that results in smothering them, with a great loss of life. It should be borne in mind that the young clams cannot extend their siphons for respiratory and feeding purposes unless they are very close to the surface of the ground. They are not capable of again reaching the surface if buried under several inches of soil. This condition is not peculiar to these species but has been observed by the writer in connection with several attempts at soft clam culture in which the seed clams were plowed under—and subsequently died.

During the present investigation large numbers of very small butter and rock clams mostly $1/16''$ to $1/8''$ in length were screened from the surface of the soil in many localities during July, August and September. There is no doubt that the present closed season is very necessary and beneficial.

The spawning period of the horse clam has not been studied in this region. During the present investigation the writer observed that during the latter part of August the horse clams in Hoods Canal were in a watery condition—the reproductive organs being of greatly reduced proportions. During the month before this at Birch Bay and vicinity the visceral mass of a considerable number of these clams was in every case distended—indicating that the reproductive elements were ripening preparatory to spawning. It is obvious that a thorough study of the breeding habits of this species must be made before the limits of the spawning season can be ascertained. It is probable, however, that the horse clam spawns during the summer months and that the present closed season is effective. A thorough enforcement of the closed season is needed in localities wherein campers and other transients dig, during the summer months, since in a number of places—Birch Bay, Samish Bay and Kitsap, the clams are undoubtedly being

depleted. In some observed instances these clams were dug and then discarded by the diggers.

The soft clam spawns in New England waters during the summer months and since the summer water temperatures in the Puget Sound region are similar it was believed that this clam would show a somewhat similar spawning period. During July at Port Susan, great numbers of very small soft clams were found on the surface of the flats. These seed clams were only 1/16" to 1/8" in length and were not probably over a few weeks old. At Birch Bay soft clams of similar sizes were observed during July. These observations indicate that the spawning season of the soft clam takes place in the early summer. Further studies are essential. Undoubtedly the present closed season is beneficial towards perpetuating this species. Even though the soft clam is not yet commercially utilized, the turning over of the clam beds during the closed season to procure other closely associated species, must cause a considerable loss of life in the young for reasons already discussed.

b. Cultivation. Clam culture has not been practiced in the Puget Sound region. The soft clam which occurs in this region has, however, been cultivated elsewhere—chiefly in the New England states. The methods of soft clam culture are extensively treated in the writer's research on "The Culture of the Soft Clam, *Mya arenaria*," available at the University of Washington library.

In general, the feasibility of clam culture of any species depends primarily upon the cost of procuring large quantities of seed and upon the adaptability of the young clams to their new environment. It is probable that the cost of procuring seed clams of all species except the soft clam would be high, on account of their relatively scattered distribution in this region (Table 2). Since the methods of clam culture now in practice involve screening the soil to procure the seed for planting it is evident that the soft clam is apparently most adaptable to culture in this region. If artificial propagation eventually becomes successful for all kinds of shellfish, it will be a very useful means of increasing the clam supply.

It should also be borne in mind that the growth of the butter and the rock clams is slow (Kincaid 1919), consequently losses of the young would take place over a period of several years. With the eastern soft clam, market size may be obtained from seed in 1 to 1.5 years. It has been observed in eastern waters that relatively thick shelled bivalves like the quahog and oyster attain market size after a longer period of growth than do the thin shelled soft clam and scallop. Further investigations on the practicability of clam culture in the Puget Sound region should be made in the future.

Conclusions.

1. The clam resources of the Puget Sound region are extensive and cover a large territory.
2. The clam species discussed in this report usually show well defined vertical distribution between high and low tide lines on the beaches and flats.
3. The soft mud clams and the rock clams usually occur at the highest tidal elevations above low water mark, and in the gravel zone.

4. Butter clams also occur in the gravel zone but often below the rock clams.
5. The horse clams and cockles occur in the sand zone near low tide lines.
6. The width of the gravel zone is often greatly less than the sand zone.
7. Soft mud and unstable sandy mud, usually identified on sight in this region by the presence of many worm burrows, are not suitable for the existence of the clam species treated in this report.
8. These clam species are not found in close proximity to large volumes of fresh water, from rivers.
9. The clam industry of this region, both fresh and canned, appears to be stable and shows no large increase during an 8 year period for the fresh and a 20 year period for the canned.
10. Further and intensive investigations are needed to ascertain the effectiveness of the closed season alone as a means of maintaining or increasing the present natural supply of clams under an increased utilization or consumption.
11. The methods of canning clams with particular reference to the processing time and shrinkage should be investigated and some standard procedure adopted.
12. The feasibility of clam culture in this region should also be investigated. Birch Bay, Kitsap or points in Hoods Canal would be most suitable for such a study.
13. The use of butter clams and rock clams for bait purposes should be discontinued.
14. The species of clams other than rock and butter clams should be utilized for food purposes. Utilization studies should be made.
15. Transient clam digging during the spawning season should be stopped.

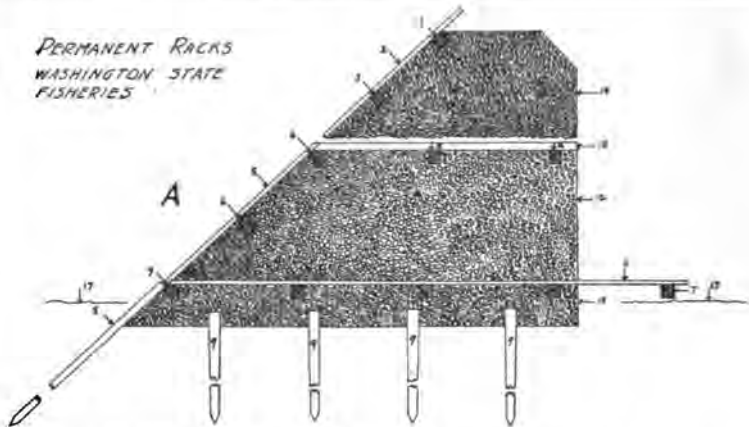
The office has had many requests for information on rack construction and details of the standard rearing ponds now in use by the department since the supply of the 1924-1925 Biennial Reports was exhausted and the following descriptions and cuts are included with this biennial to meet this demand.

RACK CONSTRUCTION.

One of the most important items in the operation of the hatcheries is the designing and construction of the racks across the streams for the catching of the salmon as they ascend the streams preparatory to spawning. When the high water condition of our mountain streams with their floods, driftwood, sawlogs, boulders, and gravel flows are considered, much has been accomplished in the past ten years along this line.

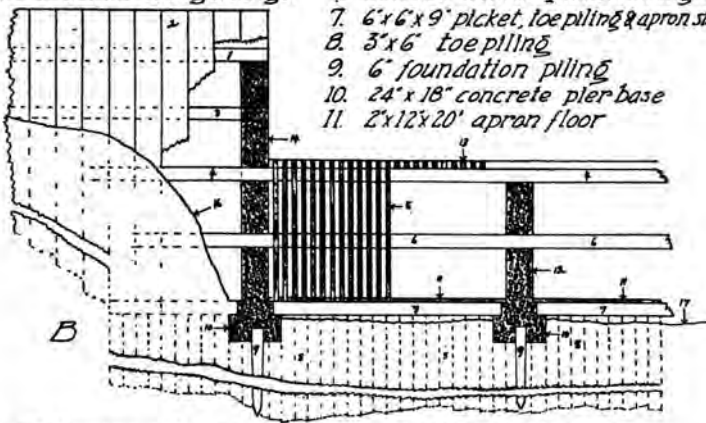
Time has proven the wisdom of the accompanying type of construction. The concrete piers rest on the gravel bed of the river with a few small piling to prevent them from moving down stream. Well driven toe-piling in front prevents the water from getting under the foundation. The apron floor carries the water over and beyond the foundation. Coarse brush and rock are used to keep the back lash from undermining the lower end of the apron. The wings are deeply trenched back into the shore and refilled on

PERMANENT RACKS
WASHINGTON STATE
FISHERIES



A. CROSS SECTION OF TYPICAL RACK CONSTRUCTION

- | | |
|-------------------------------|---|
| 1. 6"x6" top wing stringer | 4. 6"x8"x20' top picket & deck stringer |
| 2. 2"x12" wing planking | 5. 2"x2" pickets 2 inches apart |
| 3. 6"x6" center wing stringer | 6. 6"x8"x20' center picket stringer |
| | 7. 6"x6"x9' picket, toe piling & apron stringer |
| | 8. 3"x6" toe piling |
| | 9. 6' foundation piling |
| | 10. 24"x18" concrete pier base |
| | 11. 2"x12"x20' apron floor |



- | | |
|-------------------------------------|------------------------------|
| 12. 12"x60" concrete pier | 15. 6"x6"x20' deck stringers |
| 13. 2"x4"x10' deck pickets 2" apart | 16. Bank of River |
| 14. 12"x92" wing pier | 17. Bed of River |

B. FRONT VIEW OF TYPICAL RACK CONSTRUCTION

WASHINGTON STATE FISHERIES
HATCHERY DEPARTMENT. L.E.H.M.

the upper side with gravel and well brushed on the lower side to prevent the back lash from washing away the shore.

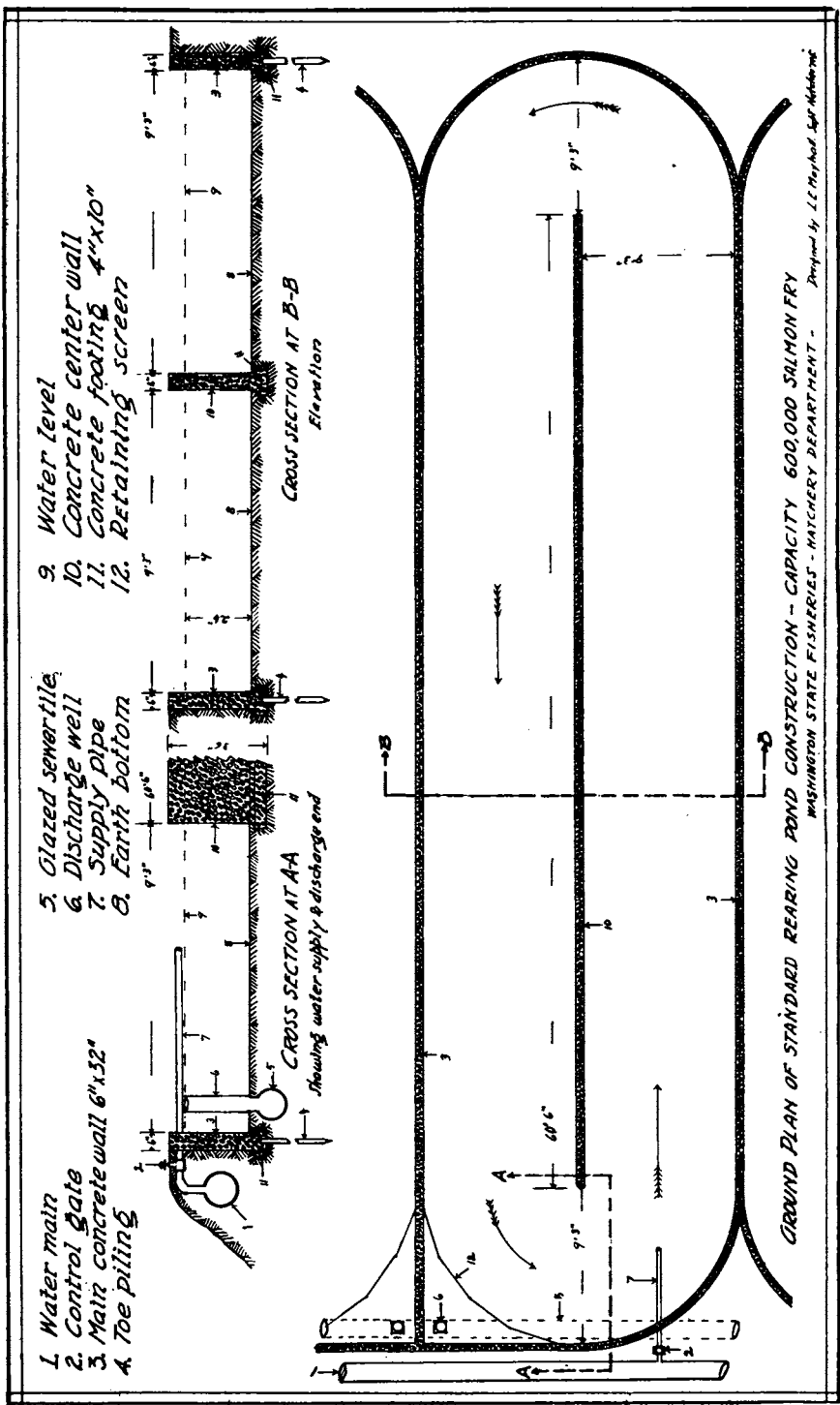
Racks of this type of design have stood for eleven years. At practically all of our hatcheries where permanent racks can be used, this type of construction is resorted to and with very few exceptions they have been found to be entirely satisfactory.

STANDARD REARING PONDS DEVELOPED BY THIS DEPARTMENT.

In 1898 the department began the first experiments in rearing salmon in out-door ponds, and as the results were very encouraging, the work has been gradually extended. In 1922 the department started serious studies of the construction problem as well as feeding, with the idea of standardizing these branches of the propagating work. In pond construction the result was the adoption of a pond as shown in the accompanying sketch. It is economical to build, permanent, of practical operation and is self-cleaning as a result of the circulating current. The current passes parallel with the screen at a greater velocity than the discharge current through it, which prevents trash and sediment from lodging on the screen and obstructing the discharge, thus requiring very little care to keep it in operation. The circulation also gives the fish their natural exercise and prevents there being a first and second class condition of young fish as in a pond that receives its water supply at one end and discharge at the other.

These ponds are built in batteries side by side. The size of the water supply main in each hatchery is governed by the head of water available, the length of the main, and the number of ponds to be supplied. The hatchery operations in each locality are governed to a certain extent by the amount of water available and therefore at some of the hatcheries it is not possible to maintain as great a number of ponds as are desired. The greatest development of rearing ponds is located in districts where the hatcheries are not situated great distances from the salt water, the idea being that hatcheries located on extreme headwaters of our larger rivers give the fingerlings an opportunity to develop and acclimate themselves when released at the hatchery, as their trip to the sea covers a long period of time; whereas, at the hatcheries located on the lower waters, the fingerlings quickly reach the sea where conditions are entirely different from the hatchery conditions and therefore fingerling salmon are perhaps not as well equipped to maintain themselves.

In building these ponds side by side as shown in the accompanying sketch, the department has developed what seems to be the most economical method of construction, at the same time providing easy access for feeding and a maximum capacity in each pond. These ponds are not so deep that dead water and filth accumulate to interfere with the rapid growth of the young fish, and the results of the last five years' experience in operating these ponds seem to have fulfilled the department's expectations.



- 1. Water main
- 2. Control Gate
- 3. Main concrete wall 6" x 32"
- 4. Toe piling
- 5. Glazed sewer tile
- 6. Discharge well
- 7. Supply pipe
- 8. Earth bottom
- 9. Water level
- 10. Concrete center wall
- 11. Concrete flooring 4" x 10"
- 12. Retaining screen

CROSS SECTION AT B-B
Elevation

CROSS SECTION AT AA
Showing water supply & discharge end

GROUND PLAN OF STANDARD REARING POND CONSTRUCTION - CAPACITY 600,000 SALMON FRY
 WASHINGTON STATE FISHERIES - HATCHERY DEPARTMENT - Designed by L. E. Marshall, Agr. Mechanic

STATISTICS

FOR

FISCAL YEAR 1925

April 1, 1925, to March 31, 1926

DIVISION OF FISHERIES

Department of Fisheries
and Game

STATE OF WASHINGTON

Appropriations, Receipts and Disbursements; Output of Salmon
Hatcheries and Costs; Licenses Issued; Take and
Value of Food Fishes; and Other Information
Regarding the Food Fishing Industry.

APPROPRIATION AND EXPENDITURES OF FISHERIES FUND.
Fiscal Year 1925.

FUND	Appropriations for One Year	Expended Fiscal Year 1925	Balance April 1, 1925
Salaries of director, supervisor, inspectors and employes; traveling expenses of director, supervisor, inspectors and employes; fuel and incidentals; construction repair and maintenance of salmon hatcheries, construction of new hatcheries; patrol service; improvements; replacements; destruction of seals; printing and other necessary expenses of the office of the supervisor of fisheries.....	\$170,000 00	*\$143,214 75	\$26,785 25

* It will be noted in checking the net expenditures of the department given above, that the total is \$2,000.00 less than the total shown in the auditor's records. This is for the reason that an item of \$2,000.00 is used as a revolving fund each period and is charged against the department, but is always returned to the state treasurer before the close of the period.

ITEMIZATION OF EXPENDITURES OF FISHERIES FUND.

	Salaries	Labor	Mileage	Subsist-ences	General Expense	Mainte-nance	Improve-ments	Total Cost of Operation
Office expense	\$9,237 00		\$638 24	\$513 35	\$5,502 51	\$29 02	\$1,363 96	\$18,124 66
*Repairs and maintenance of hatcheries.....	\$1,319 31		119 71	653 17	5,738 26	2,431 83	7,870 32	\$8,076 14
Patrol service	16,476 33	\$29,901 54	5,665 65	7,674 13	6,993 11	3,027 45	1,256 67	47,702 96
Biological survey expense	1,962 05	6,814 51	125 86	805 95	1,321 75	491 41	94 65	6,106 00
†Destruction of seals		573 39			2,563 00			2,563 00
Sundry expense	112 90		29 99	43 25	104 87			250 99
Totals.....	\$49,146 59	\$37,389 43	\$6,759 42	\$9,459 85	\$23,363 50	\$5,980 31	\$11,035 60	\$143,214 75

SEGREGATION ON REPAIRS, MAINTENANCE AND IMPROVEMENTS (CAPITAL OUTLAY) OF SALMON HATCHERIES.

	Salaries	Labor	Mileage	Subsist-ences	General Expense	Mainte-nance	Improve-ments	Total Cost of Operation	Total Eggs Taken	Total Fish Reared	Cost Per Thousand
Repairs and maintenance.....	\$17,923 31	\$24,107 80	\$104 54	\$531 42	\$4,738 90	\$1,752 09	\$1,463 32	\$50,671 38	134,926,250		\$0.375
*Rearing expense	2,040 09	3,960 00		65 00	840 00	460 00	6,240 00	13,505 00		23,103,435	1.484
Salt water pond.....	1,355 00	1,883 74	15 17	6 75	204 36	219 74	167 00	3,801 76		2,250,000	1.68
Totals.....	\$21,318 31	\$29,901 54	\$119 71	\$603 17	\$6,783 26	\$2,431 83	\$7,870 32	\$68,979 14			

* Includes cost of pond construction.

† In addition, \$117.00 was expended from the fisheries fund for seals, which were killed before April 1, 1925.

**APPROPRIATION AND EXPENDITURES OF STATE OYSTER RESERVE FUND.
Fiscal Year 1925.**

FUND	Appropriation for One Year	Expended Fiscal Year 1925	Balance April 1, 1925
For the improvement and protection of the state oyster reserves	\$9,000 00	\$5,086 61	\$3,913 39

ITEMIZATION OF EXPENDITURES OF STATE OYSTER RESERVE FUND.

Patrol	\$2,824 61
Improvement of oyster beds.....	2,262 00
Total.....	\$5,086 61

RECEIPTS OF THE FISHERIES DEPARTMENT.
Fiscal Year 1925.

CREDITED TO THE FISHERIES FUND	Puget Sound District	Columbia River District	Grays Harbor District	Willapa Harbor District	Entire State	Totals
LICENSES—						
5,672 Fishing.....	\$22,550 25	\$13,574 35	\$2,065 70	\$2,382 25	.....	\$41,572 55
235 Buyer's at \$1.00.....	115 00	88 00	18 00	14 00	.....	235 00
930 Retail dealer's at \$1.00.....	534 00	339 00	44 00	13 00	.....	930 00
124 Wholesale dealer's.....	550 00	440 00	170 00	80 00	.....	1,240 00
5 Brokers.....	20 00	20 00	.....	10 00	.....	50 00
25 Freezer's.....	180 00	50 00	30 00	.....	.....	260 00
36 Halibut dealer's.....	135 00	45 00	.....	.....	.....	180 00
1 Codfish, canning and curing.....	5 00	.....	.....	.....	.....	5 00
4 By-products manufacturing.....	100 00	.....	.....	.....	.....	100 00
23 Private hatcheries.....	225 00	350 00	.....	.....	.....	575 00
9 Hotel serving private hatchery product.....	7 50	15 00	.....	.....	.....	22 50
14 Permit to collect birds.....	4 00	1 00	.....	.....	.....	5 00
5 Hotel serving private hatchery product.....	600 00	225 00	200 00	75 00	.....	1,100 00
44 Salmon canneries.....	90 00	105 00	105 00	120 00	.....	405 00
27 Clam canneries.....	41 00	56 00	108 00	34 00	.....	239 00
109 1924 licenses.....	.....	.....	.....	.....	.....	.....
7,353 Total.....						\$46,853 08
TAXES—						
Catch tax received.....	\$11,858 03	\$69,683 75	\$4,254 30	\$6,886 52	.....	\$192,643 00
SALES—						
Spawed fish.....	50 00	1,270 35	.....	.....	.....	1,270 35
Confiscated gear.....	551 83	204 27	17 31	146 56	.....	919 97
Confiscated fish.....	.....	.....	.....	.....	.....	.....
Total.....						\$2,250 32
MISCELLANEOUS—						
Transfers.....	\$54 00	\$27 00	\$6 00	\$4 00	.....	\$101 00
Miscellaneous.....	699 06	80 80	.....	.....	.....	788 86
*Refunds.....	213 56	33 06	.....	.....	.....	247 24
†Refunds.....	737 05	112 16	19 00	7 82	.....	876 73
‡Oregon suspense.....	.....	4,114 32	.....	.....	.....	4,114 32
§Tax paid Oregon.....	.....	15,519 95	.....	.....	.....	15,519 95
Totals.....	\$139,350 90	\$106,229 61	\$2,027 40	\$9,778 05	\$14 00	\$263,394 61

RECEIPTS OF THE FISHERIES DEPARTMENT—Concluded.

Fiscal Year 1926.

CREDITED TO THE FISHERIES FUND	Puget Sound District	Columbia River District	Grays Harbor District	Willapa Harbor District	Entire State	Totals
COLLECTIONS REPORTED BY TREASURER—						
Fines.....						\$8,877 00
Interest earnings.....						2,667 65
Sale of public property.....						263 80
Refunds.....						10 00
Total.....						\$12,068 45
Total credited to fisheries fund.....						\$275,483 06
CREDITED TO THE STATE OYSTER RESERVE FUND—						
7 oyster permits at \$5.00.....	\$35 00					
Oysters sold (direct to Treasurer).....	7,241 17					
Total.....	\$7,276 17					\$7,276 17
COLLECTIONS REPORTED BY STATE TREASURER—						
Interest earnings.....						\$108 52
Secretary Oyster Commission.....						633 85
Commissioner of Public Lands (leases, etc.).....						
Total.....						\$742 37
Total credited to Oyster Reserve Fund.....						\$8,023 54
Total Receipts.....						\$283,506 60

*Refunds to Fisheries Department for tax on gasoline used in patrol boats \$876 73

†Refunds to fishing industry for overpayments on licenses and taxes... 4,114 82

‡Taxes due Oregon but not paid..... 15,519 95

§Tax paid Oregon.....

Total refunds..... \$20,511 00 Total receipts, \$283,506 60. Net receipts, \$262,995 60.

¶Refund to Fisheries Department for overpayment of filing fee.

**LICENSES ISSUED.
Fiscal Year 1925.**

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected
FISHING LICENSES—										
Pound net	232	\$11,000 00	140	\$3,500 00					232	\$11,000 00
First class pound net	25 00		158	2,370 00					140	3,500 00
Second class pound net	15 00								158	2,370 00
Pound net	35 00				50	\$885 00	47	\$705 00	106	1,590 00
Stationary fish wheel	25 00		10	500 00					16	500 00
Snow fish wheel	3 75		10	250 00					10	250 00
Set net	17	63 75	250	671 25	125	468 75	141	628 75	542	2,032 50
Gill net, \$7.50 and 1c ea. add. foot	391	3,184 00	565	4,012 50	51	527 15	1	563 00	1,048	8,257 25
Drag seine	154	1,005 83	43	1,311 00					190	2,321 96
Purse seine	30	4,225 00							30	4,225 00
Stationary fish wheel	10	50 00							10	50 00
Reef net	81	81 00	60	60 00					141	141 00
Set line	81	81 00	60	60 00					141	141 00
Hook and line	438	870 00	95	190 00	4	8 00	2	2 00	538	1,076 00
Dip bag net	4	4 00	110	110 00					114	114 00
Smelt drag bag net, \$1.00 first 40 ft., 3c ea. add. foot	63	405 82			1	5 00			64	411 02
Brush weir	12	300 00							12	300 00
Beam trawl	38	380 00							38	380 00
Clams and mussels	100	100 00			1,062	1,062 00	511	511 00	1,764	1,764 00
Clam bait	10	10 00			2	3 00	24	24 00	37	37 00
Crabs	117	117 00			5	5 80	35	35 00	158	158 00
Gill net boat puller	1	1 00							1	1 00
Gill net extension, 1c per ft.	34	34 00							34	34 00
Drag seine extension, 3c per ft.	24	72 00							24	72 00
Smelt drag bag net extension, 3c per ft.	14	42 00							14	42 00
Totals	1,876	\$22,550 28	1,022	\$13,574 35	1,341	\$2,465 70	833	\$2,382 35	5,072	\$41,612 68

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LICENSES ISSUED—Concluded.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected
DEALERS AND MISCELLANEOUS LICENSES—										
Buyers	115	\$115 00	88	\$88 00	18	\$18 00	14	\$14 00	235	\$235 00
Retail dealer's	534	534 00	330	330 00	44	44 00	13	13 00	930	930 00
Wholesale dealer's	35	550 00	44	440 00	17	170 00	8	80 00	124	1,240 00
Broker	18	20 00	2	20 00	.....	.....	1	10 00	5	50 00
Freezer	27	135 00	0	45 00	2	20 00	.....	.....	25	250 00
Halibut dealer	1	5 00	.....	.....	.....	.....	.....	.....	36	180 00
Codfish canning and curing	4	100 00	.....	.....	.....	.....	.....	.....	1	5 00
By-products manufacturing	9	225 00	14	350 00	.....	.....	.....	.....	4	100 00
Private hatchery .....	.....	.....	.....	.....	.....	.....	.....	.....	23	575 00
Private hatchery product dealer	3	7 50	6	15 00	.....	.....	.....	.....	9	22 50
Hotel serving private hatchery product	4	4 00	1	1 00	.....	.....	.....	.....	5	5 00
Permit to collect birds .....	.....	.....	.....	.....	.....	.....	.....	.....	14	14 00
Totals	772	\$1,875 50	506	\$1,948 00	81	\$252 00	50	\$121 00	1,411	\$3,666 50
CANNERY LICENSES—										
Salmon	24	\$800 00	9	\$225 00	8	\$200 00	3	\$75 00	44	\$1,100 00
Shell fish	6	90 00	.....	.....	13	195 00	8	120 00	27	405 00
Totals	30	\$890 00	9	\$225 00	21	\$395 00	11	\$195 00	71	\$1,505 00
1924 LICENSES—										
RECAPITULATION—										
Fishing licenses	1,576	\$22,550 28	1,622	\$19,574 35	1,341	\$2,995 70	833	\$2,382 25	5,672	\$41,502 96
Dealer's miscellaneous licenses	772	1,875 50	506	1,948 00	81	252 00	50	131 00	1,411	3,666 50
Cannery licenses	30	690 00	9	225 00	21	395 00	11	195 00	71	1,505 00
1924 licenses	82	41 00	34	56 00	99	108 00	84	34 00	199	239 00
GRAND TOTALS	2,710	\$25,156 76	2,173	\$15,203 35	1,542	\$3,750 70	928	\$2,742 25	7,363	\$46,353 09

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**LICENSES ISSUED.
Fiscal Year 1925.**

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected
FISHING LICENSES—										
Found net	282	\$11,600 00	140	\$3,500 00					282	\$11,600 00
First class pound net		25 00	140	3,500 00					140	3,500 00
Second class pound net		15 00	158	2,370 00					158	2,370 00
Pound net		5 00			59	\$885 00		\$765 00	106	1,560 00
Stationary fish wheel		35 00	16	560 00					16	560 00
Scow fish wheel		25 00	20	250 00					10	250 00
Set net	17	63 75	239	971 25	125	468 75	141	528 75	542	2,032 50
Gill net \$7.50 and 1c ea. add. foot	301	3,184 00	585	4,012 50	51	527 15	71	563 00	1,048	8,287 25
Drug seine	144	1,065 80	45	1,311 00			1	4 50	190	2,321 96
Purse seine	154	4,255 00							154	4,255 00
Reef net	10	50 00	60	60 00			2	2 00	10	50 00
Set line	80	80 00	95	190 00	4	8 00	1	2 00	148	148 00
Hook and line	10	870 00	116	116 00					588	1,076 00
Dip bag net	4	4 00							120	120 00
Shed drag bag net, \$1.00 first 40 ft. 2c ea. add. foot	68	406 82			1	5 00			64	411 82
Brush net	12	300 00							12	300 00
Beach trawl	35	350 00							38	380 00
Chairs and mussols	169	160 00			1,063	1,063 00	511	511 00	1,764	1,764 00
Chum bait	10	10 00			3	3 00	24	24 00	37	37 00
Crabs	117	117 00	1	1 00	5	5 80	35	35 00	158	158 00
Gill net boat puller		1 00	187	187 00				7 00	187	187 00
Gill net extension		34 00								34 00
Drug seine extension		24 15								24 15
Street drag bag net extension		14 10								14 10
Totals	1,870	\$22,550 28	1,622	\$13,574 35	1,341	\$2,465 70	833	\$2,382 95	5,672	\$41,562 58

LICENSES ISSUED—Concluded.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected
DEALERS AND MISCELLANEOUS LICENSES—										
Buyer's	115	\$115 00	88	\$88 00	18	\$18 00	14	\$14 00	235	\$235 00
Retail dealer's	534	534 00	330	330 00	44	44 00	13	13 00	980	980 00
Wholesale dealer's	55	550 00	44	440 00	17	170 00	8	80 00	124	1,240 00
Broker	2	20 00	2	20 00	.....	.....	1	10 00	5	50 00
Freezer	18	180 00	5	50 00	.....	.....	.....	.....	25	250 00
Ballnet dealer	27	135 00	9	45 00	.....	.....	.....	.....	36	180 00
Godfish canning and curing	1	5 00	.....	.....	.....	.....	.....	.....	1	5 00
By-products manufacturing	4	100 00	.....	.....	.....	.....	.....	.....	4	100 00
Private hatchery	9	225 00	14	350 00	.....	.....	.....	.....	23	575 00
Private hatchery product dealer	3	7 50	6	15 00	.....	.....	.....	.....	9	22 50
Hotel serving private hatchery product	4	4 00	1	1 00	.....	.....	.....	.....	5	5 00
Permit to collect birds .....	.....	.....	.....	.....	.....	.....	.....	.....	14	14 00
Totals	772	\$1,875 50	508	\$1,945 00	81	\$252 00	50	\$131 00	1,411	\$3,606 50
CANNERY LICENSES—										
Salmon	24	\$60 00	9	\$225 00	8	\$200 00	3	\$75 00	44	\$1,100 00
Shell fish	6	90 00	.....	.....	13	195 00	8	120 00	27	495 00
Totals	30	\$690 00	9	\$225 00	21	\$395 00	11	\$195 00	71	\$1,505 00
1924 LICENSES—										
RECAPITULATION—										
Fishing licenses	32	\$41 00	34	\$56 00	90	\$108 00	34	\$34 00	180	\$239 00
Dealer's miscellaneous licenses	1,576	\$22,550 28	1,622	\$13,574 35	1,341	\$2,995 70	833	\$2,332 25	5,672	\$41,502 98
Cannery licenses	772	1,875 50	508	1,945 00	81	252 00	50	131 00	1,411	3,606 50
1924 licenses	30	690 00	9	225 00	21	395 00	11	195 00	71	1,505 00
GRAND TOTALS	2,710	\$25,156 78	2,173	\$15,208 35	1,542	\$3,750 70	928	\$2,742 25	7,353	\$46,853 08

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**CATCH OF SALMON AND VALUE.
Fiscal Year 1925.**

DISTRICT AND GEAR WITH WHICH TAKEN	Number of Chinook Salmon	Number of Dog Salmon	Number of Humpback Salmon	Number of Silver Salmon	Number of Sockeye Salmon	Number of Steedhead	Totals
PUGET SOUND DISTRICT—							
Pound nets	235,138	67,204	1,954,771	492,115	928,960	6,152	3,024,246
Set nets	242	242	4	2,464	2,464	2,710	2,710
Gill nets	34,810	29,246	37,448	85,513	10,585	2,085	199,682
Drag seines	4,165	968	23,065	3,790	11,931	20	44,479
Purse seines	9,233	439,408	4,602,188	321,362	287,829	101	5,656,616
Reef nets	10	744	2,802	2,802	2,747	.....	53,548
Hook and lines	1,125	.....	47,296	20,977	962	236	23,369
Totals	284,496	534,812	6,935,345	989,013	1,242,820	8,594	9,006,080
Value	\$625,891 20	\$213,924 90	\$1,319,738 31	\$486,647 25	\$1,052,665 54	\$7,734 60	\$3,706,604 73
COLUMBIA RIVER DISTRICT—							
First class pound nets	101,080	49,167	.....	76,497	2,850	48,479	278,382
Second class pound nets	23,384	12,286	.....	19,867	1,270	11,541	68,348
Stationary fish wheels	12,628	.....	.....	6,868	14,008	25,568	59,002
Scow fish wheels	3,846	.....	.....	4,522	11,811	2,943	11,811
Set nets	2,076	1,310	.....	857	1,171	2,743	9,067
Gill nets	222,029	59,294	.....	25,296	5,229	46,898	309,541
Drag seines	24,844	1,871	.....	1,408	2,300	10,856	41,279
Hook and lines	1,346	.....	.....	4,020	.....	1	5,397
Dip bag nets	82	38	.....	18	.....	.....	138
Set lines	10	27	.....	.....	.....	8	54
*Totals	393,340	123,993	.....	195,761	31,359	149,035	883,479
Value	\$1,085,618 40	\$11,159 37	.....	\$88,244 65	\$15,075 00	\$134,131 50	\$1,334,828 92
GRAYS HARBOR DISTRICT—							
Pound nets	6,193	71,258	.....	37,898	.....	1,012	116,271
Set nets	971	19,079	.....	8,313	.....	705	23,698
Gill nets	5,464	41,687	.....	13,091	.....	184	69,276
Hook and line	11	.....	.....	.....	.....	.....	11
Smelt drag bag nets	33	1,035	.....	445	.....	.....	1,513
Totals	12,672	127,569	.....	59,657	.....	1,991	201,739
Value	\$14,227 80	\$19,126 35	.....	\$47,725 00	.....	\$9,421 80	\$84,501 55

* These Columbia River totals of different species of salmon secured by using average weights on the total tonnage reported in the district, as all fish in Columbia River is purchased on a tonnage basis.

CATCH OF SALMON AND VALUE—Concluded.
Fiscal Year 1925.

DISTRICT AND GEAR WITH WHICH TAKEN	Number of Chinook Salmon	Number of Dog Salmon	Number of Humpback Salmon	Number of Silver Salmon	Number of Sockeye Salmon	Number of Steelhead	Totals
WILLAPA HARBOR DISTRICT—							
Pound nets	3,854	153,212		19,514		238	176,863
Set nets	1,162	34,629		4,136		454	40,381
Gill nets	6,025	35,427		7,156		123	49,331
Hook and lines							
Totals	11,641	223,268		30,805		860	236,575
Value	\$13,387 15	\$32,150 59		\$24,644 80		\$1,548 00	\$71,730 54
ALL DISTRICTS COMBINED—							
Pound nets	369,958	353,127	1,954,771	555,301	933,086	67,467	4,264,210
Stationary fish wheels	12,528			6,368	14,008	25,593	56,002
Scow fish wheels	3,946				4,522	2,943	11,311
Set nets	5,109			15,770	1,171	3,902	75,816
Gill nets	269,825	49,860	4	131,996	16,114	49,268	670,130
Drag seines	2,839	165,504	37,443	5,198	14,231	10,876	85,758
Purse seines	29,008	2,839	23,605	321,352	237,329	101	5,656,616
Reef nets	9,238	436,408	4,602,188		2,747		53,548
Hook and lines	19	744	47,236	24,997		237	23,777
Dip bag nets	2,482		98	18			138
Smart bag nets	33			445			1,513
Set lines	19	27				8	54
Totals	702,149	1,009,582	6,665,345	1,095,237	1,274,170	160,390	10,906,873
Value	\$1,739,124 55	\$276,361 11	\$1,319,738 31	\$647,262 33	\$1,068,343 54	\$146,835 90	\$5,197,965 74

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CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE.
Fiscal Year 1925.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Clams and Mussels	Number of Crabs	Pounds of Cod	Pounds of Devil Fish	Pounds of Dog Fish	Pounds of Dolly Varden Trout	Pounds of Flounders	Pounds of Halibut	Pounds of Herring	Pounds of Perch
PUGET SOUND DISTRICT—										
Pound nets	.....	.....	8,386	102	40	.....	5,796	242	140	.....
Set nets	.....	.....	5,051	1,225	36,673	.....	.....	.....	.....	3,467
Gill nets	.....	.....	949	470	.....	.....	9,680	.....	180,900	1,225
Drag seines	.....	.....	19,947	18	2,006	.....	85	.....	.....	64,949
Purse seines	.....	.....	1,037	.....	.....	.....	.....	4,525	.....	.....
Hook and lines	.....	.....	53,146	18,303	.....	261	.....	.....	.....	20
Smelt drag bag nets	.....	.....	.....	.....	.....	.....	.....	.....	123,433	2,400
Brush weirs	.....	.....	.....	.....	.....	.....	.....	.....	359,200	7,160
Beam trawls	.....	.....	36,067	381	.....	.....	.....	.....	.....	.....
Set lines	.....	.....	26,900	85,071	2,740	.....	244,772	3,621	.....	457
Clams	253,458	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clam bait	10,387	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crabs	.....	373,744	.....	.....	.....	.....	.....	.....	.....	.....
Dip bag nets	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	245,845	373,744	151,555	105,570	41,549	261	290,333	8,391	663,863	79,746
Value	\$4,916 90	\$46,718 00	\$7,577 75	\$5,278 50	\$166 20	\$39 15	\$3,945 00	\$1,000 83	\$3,319 47	\$3,987 40

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CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Continued.
Fiscal Year 1925.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Red Snapper	Pounds of Sand Dabs	Pounds of Sea Bass	Pounds of Skates	Pounds of Shrimp	Pounds of Smelt	Pounds of Sole	Number of Sturgeon	Pounds of All Other Food Fish	Total Value
PUGET SOUND DISTRICT—										
Concluded—										
Pound nets	354		32	1,050			332	22		
Set nets			150			2,900				
Gill nets						146,104	17,988		581	
Drag seines	570		86	116		219	47			
Purse seines										
Hook and lines			408			75,541	850		1,281	
Small drag bag nets	23						300			
Beam trawls			760				294,689		5,821	
Set lines	232		362				100			
Dip bag nets				120						
Totals	1,194	826	1,083	1,236	35,671	235,664	224,237	22	7,113	
Value	\$47 92	\$74 06	\$123 96	\$25 72	\$3,567 10	\$27,079 68	\$6,728 91	\$68 00	\$35 57	\$114,770 14

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CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Continued.

Fiscal Year 1925.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Carp	Pounds of Clams and Mussels	Number of Crabs	Pounds of Perch	Number of Sturgeon	Pounds of Shad	Pounds of Smelt	Pounds of All Other Food Fish	Total Value
COLUMBIA RIVER DISTRICT—									
First class pound net.....					227	23,553			
Second class pound net.....					57	7,431			
Stationary fish wheels.....					160	15,975			
Snow fish wheels.....					245				
Set nets.....					247	784			
Gill nets.....					1,419	142,834			
Drag seines.....	294,787				2	82,847			
Dip bag nets.....							1,104,314		
Set lines.....					210				
Totals.....	294,787				2,587	282,424			
Value.....	\$17,687 22				\$10,268 00	\$5,668 48	\$85,829 42		\$99,453 12

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Continued.

Fiscal Year 1925.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Carp	Pounds of Clams and Mussels	Number of Crabs	Pounds of Perch	Number of Sturgeon	Pounds of Herring	Pounds of Smelt	Pounds of All Other Food Fish	Total Value
GRAYS HARBOR DISTRICT—									
Pound nets.....					22				
Gill nets.....					3	5,860			
Smelt drag bag nets.....				513					
Crab.....			4,056						
Clam.....		583,123							
Totals.....		583,123	4,056	513	25	5,950			
Value.....		\$31,987 38	\$507 00	\$25 66	\$100 00	\$29 75			\$32,649 78

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Continued.
Fiscal Year 1925.

DISTRICT AND GEAR WITH WHICH TAKEN						
	Pounds of Clams and Mussels	Number of Crabs	Number of Sturgeon	Pounds of Perch	Total Value	
WILLAPA HARBOR DISTRICT—						
Gill nets	.....	.....	.....	.....	.....	.....
Crab	.....	.....	.....	.....	.....	.....
Clam	.....	.....	.....	.....	.....	.....
Clam bait	.....	.....	.....	.....	.....	.....
Clam bait	.....	.....	.....	.....	.....	.....
Drag seines	.....	.....	.....	.....	.....	.....
Totals.....	411,064	141,000	846	.....	.....	.....
Value.....	\$24,845 04	\$17,707 50	\$3,384 00	\$9 75	\$45,946 29	

DISTRICT AND GEAR WITH WHICH TAKEN											
	Pounds of Carp	Pounds of Clams and Mussels	Number of Crabs	Pounds of Cod	Pounds of Devil Fish	Pounds of Dog Fish	Pounds of Dolly Varden Trout	Pounds of Flounders	Pounds of Halibut	Pounds of Herring	Pounds of Perch
ALL DISTRICTS COMBINED—											
Pound nets
Set nets
Gill nets
Drag seines
Purse seines
Hook and lines
Dip, bag nets
Swoot drag nets
Beam trawls
Brush trawls
Set lines
Crab
Crab bait
Totals.....	294,787	1,198,062	519,400	151,556	106,570	41,549	261	260,823	8,301	609,843	89,456
Value.....	\$17,687 22	\$61,749 82	\$64,962 50	\$7,577 75	\$5,273 50	\$166 20	\$39 15	\$3,905 00	\$1,000 83	\$3,349 22	\$4,022 80

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CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Concluded.
Fiscal Year 1925.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Red Snapper	Pounds of Sand Dabs	Pounds of Sea Bass	Pounds of Shad	Pounds of Skates	Pounds of Shrimp	Pounds of Smelt	Pounds of Sole	Number of Sturgeon	Pounds of All Other Food Fish	Total Value
ALL DISTRICTS COMBINED—Concluded—											
Pound nets	354		32	30,984	1,050				328		
Stationary fish wheels				15,975					160		
Scow fish wheels			150	784				392	245		
Set nets				142,884			2,900		247		
Gill nets			86	92,847	116		146,104	17,030	2,298		
Drag seines	570						219	47	2	531	
Purse seines								850		1,261	
Hook and lines		38	403				1,105,214	300			
Dip bag nets		790					75,541	294,039		5,321	
Smelt drag bag nets	22					35,671					
Beam trawls	252		392		120			100	210		
Set lines											
Totals	1,198	925	1,033	288,424	1,289	35,671	1,419,978	224,297	3,490	7,113	
Value	\$47 92	\$74 08	\$123 96	\$5,698 48	\$25 72	\$3,567 10	\$92,000 10	\$6,728 91	\$13,840 00	\$35 57	\$282,819 33
Grand Total Value											

FOOD AND SHELL FISH CANNED.
Fiscal Year 1925.

DISTRICTS	Number of 48-Lb. Cases	Value
PUGET SOUND DISTRICT—		
Chinook salmon	29,993	\$310,479 83
Dog or chum salmon.....	42,715	139,911 28
Humpback salmon.....	567,066	2,993,984 09
Silver salmon	172,007	1,615,537 57
Sockeye salmon	104,973	1,604,501 18
Steelhead salmon.....	229	1,736 20
Clams and mussels.....	2,281	56,569 22
Clam nectar.....	792	3,334 43
Other food and shell fish.....	45	315 00
Totals.....	910,111	\$6,626,408 79
COLUMBIA RIVER DISTRICT—		
Chinook salmon	170,191	\$2,362,832 54
Dog or chum salmon.....	30,226	133,184 59
Humpback salmon.....	94	278 00
Silver salmon	20,732	218,510 55
Sockeye salmon	2,900	52,997 00
Steelhead salmon	3,396	47,894 50
Shad	697	2,656 40
Other food and shell fish.....	14	733 61
Totals.....	228,202	\$2,818,767 19
GRAYS HARBOR DISTRICT—		
Chinook salmon	3,197	\$20,430 00
Dog or chum salmon.....	23,338	99,233 36
Silver salmon	7,651	49,777 20
Sockeye salmon	3,813	53,713 45
Steelhead salmon	300	1,800 00
Clams and mussels.....	29,940	233,767 56
Clam nectar	490	1,470 00
Totals.....	68,219	\$510,191 57
WILLAPA HARBOR DISTRICT—		
Chinook salmon	13,500	\$67,500 00
Dog or chum salmon.....	19,561	58,740 40
Silver salmon	10	72 00
Clams and mussels.....	9,193	77,151 00
Totals.....	42,264	\$203,463 40
ALL DISTRICTS COMBINED—		
Chinook salmon	216,851	\$2,761,242 37
Dog or chum salmon.....	115,842	431,069 63
Humpback salmon.....	567,170	2,894,262 09
Silver salmon	200,400	1,833,897 32
Sockeye salmon	111,186	1,711,181 61
Steelhead salmon.....	3,925	51,190 70
Clams and mussels.....	41,414	417,477 78
Clam nectar	1,282	4,804 43
Shad	697	2,656 40
Other food and shell fish.....	59	1,048 61
Totals.....	1,248,796	\$10,156,830 94

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FOOD AND SHELL FISH, FRESH AND PRESERVED (OTHER THAN CANNED) AND VALUE.
Fiscal Year 1925.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	Number Pounds	Value	Number Pounds	Value	Number Pounds	Value	Number Pounds	Value	Number Pounds	Value
FRESH—										
Chinook salmon	5,170,330	\$517,033 00	65,530	\$6,210 90	176,441	\$17,644 00	64,515	\$6,451 50	5,476,936	\$547,348 40
Dog salmon	1,294,970	51,578 80	105,511	1,165 10	378,940	12,630 00	186,418	6,214 00	1,977,709	71,777 90
Humpback salmon	103,968	4,620 80							103,968	4,620 80
Salmon	1,973,800	138,128 00	117,284	9,380 40	681,050	68,384 00	37,020	3,000 60	2,109,440	210,449 00
Steelhead	30,330	3,403 00	112,576	12,478 00	12,370	2,258 60	5,400	1,044 00	151,376	17,981 60
Crabs	8,650	3,019 00	284,167	12,876 17					101,070	18,781 60
Crabs and mussels	981,395	18,747 90							204,765	13,368 17
Crabs (chumby)	331,328	58,523 50			74,625	3,731 25	5,200	260 15	1,019,293	22,770 60
Cod fish	178,263	8,012 15			5,220	632 50	476,477	69,559 63	1,019,293	22,770 60
Doxh fish	101,105	5,369 28							178,263	8,012 15
Dolly Varden trout	151	95 67							101,105	5,369 28
Flounders	170,653	2,550 70							151	95 67
Hallbut	8,113	1,104 24							170,653	2,550 70
Herring	74,840	373 95			5,960	29 75			8,113	1,104 24
Rockcod	92,072	4,425 60							80,830	130 00
Trout	2,065	81 80	43,426	2,605 56	938	46 90			130 00	130 00
Red snapper	2,063	50 64							93,010	4,650 50
Sand dabs	2,063	24 24							2,063	50 64
Sea bass	2,063	7 86							2,063	50 64
Shad	371	7 54							2,063	50 64
Skates	31,440	3,444 00							43,557	2,613 42
Shrimp	273,882	9,162 64	684,380	12,306 50	550	66 00			34,440	3,444 00
Sole	52,012	5,201 20	1,120	88 75					901,821	28,763 24
Sturgeon	5,183	25 92			120	12 00	294	29 40	273,184	8,162 64
Other food fish									54,146	5,391 25
Totals	11,191,410	\$856,490 06	1,475,963	\$57,019 38	1,516,164	\$105,923 00	776,333	\$86,568 58	14,959,876	\$1,106,001 02
PRESERVED—										
Frozen	9,921,091	\$1,119,145 47	501,513	\$68,898 56	4,400	\$700 00			10,927,004	\$1,188,744 03
Kippered	3,114,114	313,370 67	43,430	3,340 30	1,500	270 00			3,158,934	317,501 47
Mild cured	3,521,909	668,511 13	212,500	46,730 50	1,980	270 00			4,143,219	715,531 13
Salled	331,827	41,240 83	31,283	2,183 50	3,260	515 00			357,392	43,946 63
Smoked	534,007	74,507 81	23,167	2,884 36					567,174	77,392 17
Totals	17,736,308	\$2,214,892 01	708,065	\$126,517 42	9,820	\$1,755 00			18,544,188	\$2,343,074 43
GRAND TOTALS.	28,927,724	\$3,071,292 07	2,274,018	\$183,536 80	1,525,984	\$107,673 00	776,333	\$86,568 58	33,504,060	\$3,449,075 45

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FISH BY-PRODUCTS.
Fiscal Year 1925.

OUTPUT	Quantity	Value
Oil	97,890 gal.	\$35,257 20
Fish meal	628 tons	24,517 00
Fertilizer	466 tons	22,566 00
Poultry food	300 tons	3,619 00
Salmon eggs	138,568 lbs.	6,846 29
Total value		\$92,804 49
APPROXIMATE AVERAGE PRICE—		
Oil		\$00 36 per gal.
Fish meal		39 04 per ton.
Fertilizer		48 42 per ton.
Poultry food		12 04 per ton.
Salmon eggs		06 per lb.

HALIBUT HANDLED BY DEALERS.
Fiscal Year 1925.

Fresh 9,791,440 pounds, valued at \$1,135,327.73
 Approximate average price..... \$00.12 per pound
 Halibut is taken mostly in Bering Sea and Alaska waters and brought to Puget Sound to be marketed.

CODFISH HANDLED BY DEALERS.
Fiscal Year 1925.

Total cured 2,460,000 pounds, valued at \$100,000.00
APPROXIMATE AVERAGE PRICE—
 Cured \$00.04 per pound

SEED OYSTERS SOLD FROM STATE RESERVES.
Fiscal Year 1925.

DISTRICT AND RESERVE	County	Number of Sacks	Value
PUGET SOUND DISTRICT—			
Oakland Bay Reserve	Mason	3,467.4	\$6,934 80
Clifton Reserve	Mason	408.5	306 37
Totals.....		3,875.9	\$7,241 17
Number of licenses issued to take oysters from state reserves, 7.....			\$35 00

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OYSTER INDUSTRY.**Fiscal Year 1925.**

(Compiled from reports received from 37 companies or individuals in Puget Sound District, and 5 in Willapa Harbor District.)

	OYSTERS MARKETED	
	No. Sacks	Value
PUGET SOUND DISTRICT—		
Native.....	27,322	\$347,696 50
*Eastern.....	2,000	16,000 00
Totals.....	29,322	\$363,696 50
WILLAPA HARBOR DISTRICT—		
Native.....	295	\$2,737 25
Eastern.....	706	9,350 00
Totals.....	1,001	\$12,087 25
BOTH DISTRICTS COMBINED—		
Native.....	27,617	\$350,433 75
Eastern.....	2,706	25,350 00
Totals.....	30,323	\$375,783 75

* Includes transplanted Japanese Oysters.

AVERAGE VALUE OF OYSTERS PER SACK.**Fiscal Year 1925.**

	Puget Sound District	Willapa Harbor District
Native.....	\$12 73	\$9 23
Eastern.....	8 00	13 24

**OYSTER LANDS.
Fiscal Year 1925.**

NUMBER OF ACRES AND VALUE

DISTRICT	Owned	Value	Leased	Value	Total Lands	Total Values	Native Producing	Value	Eastern Producing	Value	Total Producing	Total Values
Puget Sound.	1,971.86	\$1,535,750 00	21.33	\$2,122 29	1,993.19	\$1,537,872 29	529.63	\$721,650 00	.....	.....	529.63	\$721,650 00
Willapa Harbor.	4,571.00	244,325 00	230.00	23,000 00	4,801.00	267,325 00	730.00	47,600 00	644.00	\$115,850 00	1,374.00	163,450 00
Totals.....	6,542.86	\$1,560,075 00	251.33	\$25,122 29	6,794.19	\$1,606,207 29	1,259.63	\$769,250 00	644.00	\$115,850 00	1,903.63	\$885,100 00

Average values were substituted where valuations were not given. From the Puget Sound District 37 reports show a valuation of \$1,337,882.29 on a total of 1,993.19 acres (an average of \$671.23 per acre) and of this number 529.63 acres were under cultivation and valued at \$721,650.00. All figures concerning the Japanese oyster lands are included under Puget Sound owned oyster beds.

From the Willapa Harbor District 7 reports show a valuation of \$267,325.00 on a total of 4,801 acres (an average of \$55.68 per acre) and of this number 1,374 acres were under cultivation and valued at \$163,450.00.

Of the above owned and leased lands 391 acres are diked, the value of same being \$539,750.00.

***VALUE OF FISHERIES PRODUCT.
Fiscal Year 1925.**

PRODUCT	Value
Food and shell fish canned.....	\$10,158,830 94
Food and shell fish handled fresh.....	1,106,001 02
Food fish preserved (other than canned).....	2,343,074 43
Fish by-products	92,804 49
Halibut	1,135,327 73
Codfish	100,000 00
Oysters	375,783 75
Total.....	\$15,311,822 36

* Value based on average wholesale price. The halibut and codfish are not strictly Washington products, as these fish are taken mostly in the waters of Bering Sea and Alaska and brought to Puget Sound to be marketed.

OUTPUT OF SALMON FROM THE STATE HATCHERIES.
Fiscal Year 1926.

	Number Females Spawned	Number Eggs Taken	No. Eggs Received From Other H'cher's	No. Eggs On Hand April 1, 1925	Number Eggs Lost	Number Eggs Shipped	No. Eggs On Hand March 31, 1926	Number Fry Hatched	Number Fry On Hand April 1, 1925	No. Fry Lost	No. Fry Shipp'd	Number Fry Planted	Number Fry Hand March 31, 1926	No. Fry Reared In Ponds
OHINOOK SALMON														
PUGET SOUND DIST.—														
Dungeness	176	750,000			68,000			682,000	8,891,000	6,093,400	38,300	682,000	8,893,700	6,552,400
Green River	2,027	10,246,000			283,000	*1,072,000		8,891,000	6,093,400	38,300		6,552,400	8,893,700	62,125
Nooksack	13	65,000			2,000			64,000	1,875			62,125		
Puyallup River	13	60,500			4,492			60,008	269			59,739		
Skykomish	20	127,500			4,500			123,000		408		122,592		
Totals	2,249	11,250,000			387,992	1,072,000		9,890,008	6,093,400	40,912		7,478,796	8,893,700	6,614,525
COLUMBIA RY. DIST.—														
Chinook	855	1,802,000	2,000,000		65,000			3,737,000	37,196,177	714		2,437,182	1,819,800	2,400,000
Kalama	4,827	26,175,000			1,127,000	110,352,000		14,696,000	3,480,250	15,260		10,869,960	7,800,000	6,190,250
Kittitas			1,000,000		4,100			995,900	1,633,500	6,500		1,632,000	890,800	
Totals	5,282	27,977,000	3,000,000		1,196,100	10,352,000		19,428,900	5,160,946	40,504		14,969,142	9,610,200	8,590,250
GRAYS HBR. DIST.—														
Chehalis	50	186,000			13,500			172,500		221		172,279		
Totals	50	186,000			13,500			172,500		221		172,279		
WILLAPA HBR. DIST.—														
Naselle River	1,035	4,728,600			475,400	1,530,000		2,723,900		1,720		2,721,480		2,541,480
Willapa	386	1,770,000	1,530,000		102,300			3,197,700	421,465	1,855		3,617,310		3,482,420
Totals	1,431	6,498,600	1,530,000		577,700	1,530,000		5,920,900	421,465	3,575		6,338,790		6,023,900
RECAPITULATION—														
Puget Sound District	2,249	11,250,000			387,992	1,072,000		9,890,008	6,093,400	40,912		7,478,796	8,893,700	6,614,525
Columbia River Dist.	5,287	27,977,000	3,000,000		1,196,100	10,352,000		19,428,900	5,160,946	40,504		14,969,142	9,610,200	8,590,250
Grays Harbor Dist.	50	186,000			13,500			172,500		221		172,279		
Willapa Harbor Dist.	1,431	6,498,600	1,530,000		577,700	1,530,000		5,920,900	421,465	3,575		6,338,790		6,023,900
Totals	9,019	45,911,600	4,530,000		2,145,292	12,954,000		35,342,308	11,675,811	85,212		28,929,007	18,008,900	21,228,675

*22,000 shipped to University of Washington.
*50,000 shipped to Pierce County Game Commission.

16,882,000 shipped to State of Oregon.
12,000,000 shipped to Alaska Fish Commission.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.
Fiscal Year 1925.

	Number Females Spawmed	Number Eggs Taken	No. Eggs Received From Other H'cher's	No. Eggs On Hand April 1, 1925	No. Eggs Lost	Number Eggs Shipped	No. Eggs on Hand March 31, 1925	Number Fry Hatched	Fry Received From Other H'cher's	Number Fry on Hand April 1, 1925	No. Fry Lost	No. Fry Shipped	Number Fry on Hand March 31, 1925	Number Fry Reared in Ponds
DOG SALMON														
PUGET SOUND DIST.—														
Chambers Creek.....	251	682,500	.....	40,000	14,500	.....	.....	40,000	100,000	901,500	5,300	100,000	1,147,500	70,000
Green River No. 1.....	.....	.....	.....	.....	.....	.....	.....	678,000	.....	103,016	116	.....	192,000	1,147,500
Green River No. 2.....	.....	.....	.....	.....	.....	.....	.....	490,500	.....	603,004	2,900	.....	60,000	526,700
Nooksack.....	220	500,200	.....	.....	18,700	.....	.....	370,100	.....	4,675	.....	.....	427,000	.....
Puyallup River.....	130	320,500	.....	.....	20,400	.....	.....	1,824,350	.....	5,355,025	22,710	.....	98,419	.....
Samish.....	533	1,571,000	.....	.....	40,650	.....	.....	.....	.....	130,404	85	.....	5,580,125	1,518,140
Skykomish.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	136,319	.....
Salt Water Pond.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,500,000	.....
Totals.....	1,140	3,172,000	.....	40,000	100,650	.....	.....	3,111,350	1,600,000	7,519,639	35,780	100,000	9,027,263	4,008,540
COLUMBIA RV. DIST.—														
Chinook.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66,754	22	.....	66,752	.....
Totals.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66,754	22	.....	66,752	.....
GRAYS HARBOR DIST.—														
Chehalis.....	3,203	8,240,000	.....	.....	418,000	.....	.....	4,422,000	.....	1,804,414	1,700	.....	6,224,714	.....
Chehalis No. 2.....	.....	.....	.....	.....	13,910	.....	.....	1,086,000	.....	66,754	22	.....	1,078,845	.....
Humtulpis.....	52	78,000	.....	.....	4,000	.....	.....	1,574,000	.....	.....	4,100	.....	1,569,900	.....
Totals.....	3,255	8,418,000	3,500,000	435,910	435,910	3,500,000	.....	7,082,000	.....	1,804,414	13,045	.....	9,773,459	.....
RECAPITULATION—														
Puget Sound Dist.....	1,140	3,172,500	.....	40,000	100,650	.....	.....	3,111,350	1,600,000	7,519,639	35,780	100,000	9,027,263	4,008,540
Columbia River Dist.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66,754	22	.....	66,752	.....
Grays Harbor Dist.....	3,255	8,418,000	3,500,000	435,910	435,910	3,500,000	.....	7,082,000	.....	1,804,414	13,045	.....	9,773,459	.....
Totals.....	4,404	11,560,500	3,500,000	40,000	530,560	3,500,000	.....	11,094,040	1,600,000	9,300,807	48,883	100,000	17,867,454	4,300,000

* 1,500,000 fry received from U. S. Bureau, Quileene, Washington.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.

Fiscal Year 1925.

	Number Females Spawned	Number Eggs Taken	No. Eggs Received From Other Hatcheries	No. Eggs On Hand April 1, 1925	No. Eggs Lost	Number Eggs Shipped	No. Eggs on Hand March 31, 1926	Number Fry Hatched	Fry Received From Other Hatcheries	Number Fry on Hand April 1, 1925	No. Fry Lost	No. Fry Shipped	Number Fry Planted	Number Fry on Hand March 31, 1926	Number Fry Reared in Ponds
HUMPRACK SALMON															
PUGET SOUND DIST.—															
Dungeness	280	280,000			21,000			259,000					259,000		
Green River	501	1,000,500			25,500			981,000			2,200		981,800		400,000
Puyahup River	2,167	4,565,250			217,275	2,000,000		2,357,975			11,000		2,326,275		
Skykomish	24	45,000			3,150			41,850			270		41,580		
Salt Water Pond									91,000,000				1,000,000		1,000,000
Totals	2,962	5,880,750			296,925	2,000,000		3,022,785	1,000,000		14,070		4,608,715		1,400,000

* 2,000,000 shipped to U. S. Hatchery, Quilleme, Washington.

† 1,000,000 received from U. S. Hatchery, Quilleme, Washington.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.

Fiscal Year 1925.

	Number Females Spawned	Number Eggs Taken	No. Eggs Received From Other Hatcheries	No. Eggs On Hand April 1, 1925	No. Eggs Lost	Number Eggs Shipped	No. Eggs on Hand March 31, 1926	Number Fry Hatched	Fry Received From Other Hatcheries	Number Fry on Hand April 1, 1925	No. Fry Lost	No. Fry Shipped	Number Fry Planted	Number Fry on Hand March 31, 1926	Number Fry Reared in Ponds
SOCKEYE SALMON															
PUGET SOUND DIST.—															
Green River	3	8,000			800			7,200			1,500		5,700		
Totals	3	8,000			800			7,200			1,500		5,700		

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.
Fiscal Year 1925.

	Number Females Spawmed	Number Eggs Taken	No. Eggs Received From Other Hatcheries	Number Eggs on Hand April 1, 1925	Number Eggs Lost	Number Eggs Shipped	Number Eggs on Hand March 31, 1926	Number Fry Hatched	Number Fry on Hand April 1, 1925	No. Fry Lost	No. Fry Shipped	Number Fry Planted	Number Fry on Hand March 31, 1926	Number Fry Reared in Ponds	
SILVER SALMON															
FUGET SOUND DIST.—															
Dungeness	3,702	10,794,000	1240,000	489,000	585,500	190,000	19,176,000	480,000	7,004,500	367,400	367,400	480,000	10,323,000	2,687,500	
Green River No. 2				2,644,500				19,176,000	4,117,148	948		4,116,600			
Nooksack	841	2,472,500	1,500,000	2,925,800	139,400	50,700	4,304,250	1,409,300	4,371,100	8,800	8,800	6,384,500	2,282,000	6,384,500	
Richuck				109,728				1,409,300	2,438,940	19,325		596,100	900,000		
Traylor River	622	1,903,250	1,000,000	4,043,750	271,850		3,673,400	1,943,483	2,228,630	52,775		3,714,383	622,475		
Samsish	4,025	11,182,000	2,000,000	1,194,800	424,500	13,000,000	10,962,315	4,968,567	2,760,000	2,200		6,100,230	7,310,225	4,700,230	
Skykomish				1,194,800				4,968,567	2,760,000	2,200		2,757,800			
Shoemish				10,588,778	1,324,225	3,150,000	4,136,350	13,097,853	27,618,825	460,473		44,528,478	25,728,727	13,871,280	
Totals	12,943	39,380,250	1,740,000	10,588,778	1,324,225	3,150,000	4,136,350	13,097,853	27,618,825	460,473		44,528,478	25,728,727	13,871,280	
COLUMBIA RY. DIST.—															
Kalama			1,385,000	1,690,429	21,850			3,312,579	2,364,770	5,875		5,397,474	250,000		
Totals			1,385,000	1,690,429	21,850			3,312,579	2,364,770	5,875		5,397,474	250,000		
GRAYS HBR. DIST.—															
Chehalis	7,604	20,126,000		4,358,666	1,137,000	8,000,000	6,600,000	9,327,066	3,199,300	9,100		8,600,600	3,857,500		
Chehalis No. 2			6,000,000	785,200	59,170		2,255,700	4,491,350	4,157,940	11,000		5,832,785	2,401,500		
Humptulps	329	668,050	2,000,000	42,213	42,213		997,562	1,028,305	1,387,000	16,047		1,530,000	1,469,256		
Totals	7,933	20,794,050	8,000,000	5,135,166	1,238,113	8,000,000	9,233,262	15,447,661	8,740,240	36,177		16,023,401	6,128,256		
WILLAPA HBR. DIST.—															
Naselle River			1,600,000	183,000	3,200			900,800	1,728,615	860		2,124,565	600,000	1,798,000	
Willapa	2,646	7,163,500		183,000	530,000	2,335,000	112,500	4,865,000	3,693,475	2,325		6,146,080	2,108,070	4,330,000	
Totals	2,646	7,163,500	1,600,000	183,000	530,000	2,335,000	112,500	5,560,800	5,422,090	3,175		8,270,645	2,708,070	6,128,000	
RECAPITULATION—															
Fuget Sound Dist.	12,943	39,380,250	1,740,000	10,588,778	1,324,225	3,150,000	4,136,350	13,097,853	27,618,825	460,473		44,528,478	25,728,727	13,871,280	
Columbia River Dist.			1,385,000	1,690,429	21,850			3,312,579	2,364,770	5,875		5,397,474	250,000		
Grays Harbor Dist.	7,933	20,794,050	8,000,000	5,135,166	1,238,113	8,000,000	9,233,262	15,447,661	8,740,240	36,177		16,023,401	6,128,256		
Willapa Harbor Dist.	2,646	7,163,500	1,600,000	183,000	530,000	2,335,000	112,500	5,560,800	5,422,090	3,175		8,270,645	2,708,070	6,128,000	
Totals	23,516	67,337,800	12,075,000	17,806,377	2,324,288	13,485,000	13,482,627	47,417,833	44,121,925	504,700		74,219,998	36,815,060	19,360,280	

* 150,000 shipped to Commissioners of Lincoln Park, Chicago, Ill.
 † 240,000 received from King County Game Commission.
 ‡ 1,500,000 shipped to U. S. Hatchery, Quileme, Washington.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.
Fiscal Year 1925.

	Number Females Spawmed	Number Eggs Taken	No. Eggs Received From Other Hatcheries	Number Eggs on Hand April 1, 1925	Number Eggs Lost	Number Eggs Shipped March 31, 1925	Number Eggs on Hand March 31, 1925	Number Fry Hatched	Number Fry on Hand April 1, 1925	No. Fry Lost	No. Fry Shipped	Number Fry Planted	Number Fry on Hand March 31, 1925	Number Fry Reared in Ponds
STEELHEAD														
PUGET SOUND DIST.—														
Dungeness	127	455,000	.....	22,000	110,000	.....	323,000	.....	.....	.....	410,000	223,000	.....	.....
Green River	113	257,500	.....	16,800	230,000	35,200	200,500	.....	.....	.....	.....	204,500	2,000	165,000
Nooksack	30	104,500	.....	25,000	.....	.....	106,350	.....	.....	.....	.....	105,500	.....	105,000
Samish	160	539,000	.....	25,450	.....	286,400	290,150	.....	.....	18,465	135,000	111,550	.....	111,550
Skykomish	124	520,500	.....	31,425	9125,000	108,425	397,500	.....	.....	1,120	.....	348,915	17,465	.....
Totals	554	1,936,500	.....	221,500	129,275	245,000	490,025	1,293,700	.....	15,565	235,000	1,023,670	19,465	270,000
GRAYS HBR. DIST.—														
Chehalis	230	781,000	.....	193,000	35,300	725,000	333,700	380,000	.....	700	53,000	306,300	20,000	.....
Humtullips	47	80,000	.....	1,800	.....	.....	78,110	.....	.....	.....	.....	.....	.....	.....
Totals	277	861,000	.....	193,000	37,100	225,000	411,810	380,000	.....	700	53,000	306,300	20,000	.....
WILLAPA HBR. DIST.—														
Willapa	534	1,391,000	.....	303,800	101,600	9125,000	496,000	1,082,200	124,840	2,123	.....	1,085,342	90,575	.....
Totals	534	1,391,000	.....	303,800	101,600	125,000	496,000	1,082,200	124,840	2,123	.....	1,085,342	90,575	.....
REGAPITULATION—														
Puget Sound Dist.	554	1,936,500	.....	221,500	129,275	245,000	490,025	1,293,700	.....	15,565	235,000	1,023,670	19,465	270,000
Grays Harbor Dist.	277	861,000	.....	193,000	37,100	225,000	411,810	380,000	.....	700	53,000	306,300	20,000	.....
Willapa Harbor Dist.	534	1,391,000	.....	303,800	101,600	125,000	496,000	1,082,200	124,840	2,123	.....	1,085,342	90,575	.....
Totals	1,365	4,188,500	.....	808,300	268,065	565,000	1,397,835	2,735,900	124,840	18,388	288,000	2,415,312	130,040	270,000

1 100,000 shipped to Clallam County. 6 125,000 shipped to Grays Harbor County.
 2 20,000 shipped to University of Washington. 7 225,000 shipped to Grays Harbor County.
 3 125,000 shipped to Snohomish County. 8 53,000 shipped to Grays Harbor County.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Concluded.
Fiscal Year 1925.

ALL SPECIES COMBINED	Number Females Spawmed	Number Eggs Taken	No. Eggs Received From Other H'cher's	Number Eggs On Hand April 1, 1925	Number Eggs Lost	Number Eggs Shipped	Number Eggs On Hand March 31, 1925	Number Fry Hatched	No. Fry Received From Other H'cher's	Number Fry On Hand April 1, 1925	No. Fry Lost	No. Fry Shipp'd	Number Fry Planted	Number Fry On Hand March 31, 1925	Number Fry Reared In Ponds
PUGET SOUND DIST.—															
Chambers Creek				40,000		100,000		40,000		130,000		100,000	70,000		
Dungeness	588	1,485,000		480,000		100,000		1,744,000		13,000,400		414,700	1,044,000	19,447,000	9,804,900
Green River	6,597	23,007,900	240,000	2,665,500	121,000	1,242,000	35,200	23,941,700	100,000	13,000,400			4,329,500	19,447,000	9,804,900
Green River No. 2							50,700	4,065,300		4,870,164	664		6,612,275	2,700,000	6,562,275
Nooksack	1,110	3,152,200		2,051,500	178,700	2,000,000		1,400,000		3,042,024	32,070		6,081,016	1,000,000	1,000,000
Puget Sound	2,851	6,918,500	1,500,000	199,728	307,022	2,000,000		4,720,586	2,500,000	7,784,255	88,980	135,000	11,880,010	8,884,705	9,060,200
Salt Water Pond	4,726	13,312,000		4,086,000	325,000	3,125,000	3,020,450	13,154,500		14,803,911	10,368		11,611,021	4,070,402	
Samish	3,933	13,701,500		1,220,000	403,965	3,125,000	611,025	10,888,160		2,760,000	2,200		2,757,800		
Skykomish															
Snohomish															
Totals	19,890	61,637,100	1,740,000	10,859,278	2,180,907	6,467,000	4,620,375	60,653,406	2,000,000	41,231,864	567,300	335,000	65,072,622	38,210,432	27,056,406
COLUMBIA RY. DIST.—															
Chinook	355	1,892,000	2,000,000		65,000			3,737,000		103,050			2,503,014	1,310,300	2,400,000
Kalama	4,927	26,175,000	1,835,000	1,069,429	1,148,850	10,332,000		18,098,579		5,831,020	22,105		16,267,434	7,550,000	
Kittitas			1,000,000		4,100			995,900		1,633,500			1,632,000	960,900	6,190,250
Totals	5,282	27,977,000	4,335,000	1,999,429	1,217,950	10,332,000		22,741,479		7,568,470	40,401		20,403,248	8,900,200	8,590,250
GRAYS HARBOR DIST.—															
Chehalis	11,087	20,433,000		4,531,000	1,003,800	11,725,000	6,383,700	14,362,466		5,002,714	11,724	53,000	15,363,950	3,877,500	
Choballis			8,000,000	786,200	73,080		2,285,000	6,477,420		4,153,040	18,275		7,811,580	2,801,505	
Humppalls	428	826,050	3,500,000		43,133		1,075,612	3,202,345		1,387,000	20,147		3,009,900	1,409,258	
Totals	11,515	30,259,050	11,500,000	5,318,166	1,725,013	11,725,000	9,645,012	23,982,191		10,544,454	50,143	53,000	26,275,439	8,148,263	
WILLAPA BAY DIST.—															
Naselle River	1,055	4,728,000	1,000,000		475,000	1,530,000		3,720,000		1,728,615	2,570		4,846,045	600,000	4,339,480
Willapa	3,570	10,254,500	1,530,000	576,800	530,900	2,400,000	608,500	8,822,900		4,259,780	6,305		10,848,732	2,207,645	7,812,420
Totals	4,625	15,032,500	2,530,000	576,800	1,018,500	3,930,000	608,500	12,542,900		5,988,395	8,873		15,694,777	2,807,645	12,151,900
RECAPITULATION—															
Puget Sound	10,800	61,637,100	1,740,000	10,859,278	2,180,907	6,467,000	4,620,375	60,653,406	2,000,000	41,231,864	567,300	335,000	65,072,622	38,210,432	27,056,406
Columbia River	5,282	27,977,000	4,335,000	1,999,429	1,217,950	10,332,000		18,098,579		7,568,470	40,401		20,403,248	8,900,200	8,590,250
Grays Harbor	11,515	30,259,050	11,500,000	5,318,166	1,725,013	11,725,000	9,645,012	23,982,191		10,544,454	50,143	53,000	26,275,439	8,148,263	
Willapa Harbor	4,005	15,032,500	2,530,000	576,800	1,018,500	3,930,000	608,500	12,542,900		5,988,395	8,873		15,694,777	2,807,645	12,151,900
Totals	41,292	134,926,250	20,105,000	18,744,673	6,141,070	32,554,000	14,870,887	120,220,096	2,000,000	65,313,388	672,723	388,000	128,046,180	69,025,540	47,708,553

SUMMARY OF OUTPUT OF SALMON FROM STATE HATCHERIES.
Fiscal Year 1925.

	CHINOOK	DOG	HUMPBACK	SILVER	SOCKEYE	STEELHD	TOTALS
Number of females spawned.....	9,012	4,404	2,902	23,516	3	1,365	41,202
EGGS—							
Taken by state hatcheries.....	45,911,600	11,560,600	5,889,750	67,337,800	8,000	4,188,500	134,026,250
Received from King county.....				240,000			240,000
Totals.....	45,911,600	11,560,600	5,889,750	67,577,800	8,000	4,188,500	135,106,250
On hand April 1, 1925.....		40,000		17,896,373		808,300	18,744,673
Grand Totals.....	45,911,600	11,600,600	5,889,750	85,474,173	8,000	4,996,800	153,910,923
Lost.....	2,145,292	536,560	266,965	2,024,288	800	268,065	6,141,970
Furnished to University of Washington (experimental purposes).....	22,000					20,000	42,000
follows—							
Clallam County.....						100,000	100,000
Grays Harbor County.....						350,000	350,000
Snohomish County.....						125,000	125,000
Pierce County.....	50,000			150,000		50,000	150,000
Furnished to Commissioners of Lincoln Park, Chicago, Illinois.....	6,352,000					6,352,000	6,352,000
Furnished to State of Oregon.....	2,000,000					9,000,000	9,000,000
Furnished Alaska Territorial Fish Commission.....						3,500,000	3,500,000
Furnished United States Bureau of Fisheries.....			2,000,000	1,500,000		5,000,000	5,000,000
On hand March 31, 1925.....				13,482,052		1,397,885	14,879,887
FRY—							
Hatched.....	35,342,308	11,004,040	3,022,785	67,417,833	7,200	2,735,000	120,890,066
On hand April 1, 1925.....	11,675,811	9,360,807		44,121,925		134,840	66,313,383
Received from U. S. Hatchery, Quilcene.....		1,500,000	1,000,000				2,500,000
Lost.....	85,212	48,863	14,070	504,700	1,500	18,388	672,723
Furnished to counties (planted in lieu of trout).....						288,000	288,000
Planted.....	29,029,007	17,807,454	4,038,715	74,210,908	5,700	2,415,312	128,046,186
On hand March 31, 1925.....	18,008,900	4,068,540		36,815,060		139,040	59,026,540

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**PERCENTAGE OF LOSS ON EGGS AND FRY.
Fiscal Year 1925.**

SPECIE	Loss on Eggs Per Cent	Loss on Fry Per Cent
Chinook.....	4.7	0.24
Chum.....	4.8	0.44
Humpback.....	4.5	0.39
Silver.....	3.4	0.75
Sockeye.....	10.0	20.08
Steelhead.....	5.3	0.67

**AVERAGE NUMBER OF EGGS TAKEN TO FEMALE
Fiscal Year 1925.**

SPECIE	Average Number Eggs
Chinook.....	5,094
Chum.....	2,631
Humpback.....	2,029
Silver.....	2,863
Sockeye.....	2,606
Steelhead.....	3,068

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals	
1925						
May 12	H. G. Reeves	Fishing in closed waters.	Guilty.	\$1 00	\$7 00	
May 12	W. Henry Smith	Fishing in closed waters.	Guilty.	1 00		
May 12	J. E. Crosby	Fishing in closed waters.	Guilty.	1 00		
May 12	T. Subadink	Fishing in closed waters.	Guilty.	1 00		
May 12	M. G. Twesten	Fishing in closed waters.	Guilty.	1 00		
May 12	F. E. Crosby	Fishing in closed waters.	Guilty.	1 00		
May 12	D. C. Mathews	Possession of illegal salmon.	Guilty.	1 00		
OLALLAM COUNTY						
Sept. 27	Geo. Mattson	Fishing in river with purse seine.	Guilty.	\$100 00		
Sept. 27	Rogers Orlfax	Fishing in river with purse seine.	Guilty.	100 00		
Sept. 27	Tom Holden	Fishing in river with purse seine.	Guilty.	100 00		
Sept. 27	Martin Hunter	Fishing in river with purse seine.	Guilty.	100 00		
Oct. 3	Frank Balch	Buying fish without license.	Guilty.	10 00		
Oct. 4	C. Sabell & Crew	Fishing within three miles of river.	Not guilty.			
Oct. 6	Ole S. Blake	Fishing within three miles of river.	Guilty.	100 00		
Oct. 8	Harold Nordagset	Fishing within three miles of river.	Guilty.	50 00		
Oct. 8	Harold Nordagset	Fishing within three miles of river.	Guilty.	50 00		
Oct. 9	Bert Ronning	Alten fishing.	Guilty.	50 00		
Oct. 9	William Oakley	Fishing within three miles of river.	Guilty.	50 00		
Oct. 9	John Torneaus, Jr.	Fishing within three miles of river.	Guilty.	50 00		
Oct. 9	Sam Torneaus	Fishing within three miles of river.	Guilty.	50 00		
Oct. 9	Gus Huggsvik	Fishing within three miles of river.	Guilty.	50 00		
Oct. 14	Art Stern	Spearing salmon.	Guilty.	2 00		
Oct. 22	Leo Dval	Alten fishing.	Guilty.	50 00		
Oct. 22	Matt Adoanovich	Alten fishing.	Guilty.	50 00		
Oct. 26	Nick Mosch	Alten fishing.	Guilty.	50 00		
Oct. 26	John Borovich	Alten fishing.	Guilty.	50 00		
Oct. 26	Joe Mizlich	Alten fishing.	Guilty.	50 00		
Oct. 30	Tom Olson	Alten fishing.	Guilty.	30 days jail 50 00		
1926						
Jan. 16	A. D. Fernandez	Selling fish without license.	Guilty.	20 00	1,172 00	
Jan. 16	A. D. Fernandez	Possession of more than 20 pounds of steelheads.	Guilty.	20 00		
Jan. 16	A. D. Fernandez	Fishing in closed waters.	Guilty.	20 00		

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
CLARK COUNTY					
1925 Dec. 11	C. Helm	Operating fish market without license	Guilty	No fine	
Dec. 12	C. L. Gilpin	Possession of short fish	Dismissed		
COWLITZ COUNTY					
1925 Mar. 3	John Wood	Fishing without license	Guilty	\$75 00	\$75 00
GRAYS HARBOR COUNTY					
1925 April 29	Victor Furer	Fishing during closed season	Guilty	\$25 00	
Sept. 14	William Manning	Fishing in closed waters	Guilty	47 50	
Sept. 14	A. Lowman	Fishing in closed waters	Guilty	47 50	
Oct. 4	K. J. Potter	Gaining salmon	Guilty	10 00	
Oct. 4	L. J. Potter	Gaining salmon	Guilty	12 50	
Oct. 4	Oscar Cope	Snag hooking salmon	Guilty	12 50	
Oct. 4	Max Sprowberg	Spawning salmon	Guilty	12 50	
Nov. 1	James Rappert	Fishing illegally	Guilty	10 00	172 50
GRAYS HARBOR COUNTY					
1925 April 23	Henry Edmondson	Oregon resident using Washington license	Guilty	\$2 40	
April 23	W. E. Steward	Oregon resident using Washington license	Guilty	3 00	
April 23	H. Craighend	Oregon resident using Washington license	Guilty	5 days jail	
April 23	A. Sherr	Oregon resident using Washington license	Guilty	4 days jail	
April 23	Udell Frank	Oregon resident using Washington license	Guilty	7 00	
Oct. 2	Claude Barrows	Fishing above dead line with set nets	Guilty	5 00	
Nov. 1	H. J. Sellers	Fishing with net in prohibited area	Guilty	25 00	
Nov. 15	J. Newlin	Gaining salmon	Guilty	10 00	
FINED AND BARRED (dismissed)					
Nov. 20	Joe and Allen Chenolds	Fishing with pound net with too long lead	Guilty		
Nov. 20	Clarence Boyer	Fishing with pound net with too long lead	Guilty		
Dec. 28	Dan Parker	Catching steelheads out of season	Guilty	25 00	
Dec. 28	Sam Mosgrove	Catching steelheads out of season	Guilty	25 00	
1926					
Jan. 1	Jim Hilcoits	Selling razor clams out of season	Guilty	15 00	
Jan. 4	E. D. Answorth	Catching steelheads out of season	Guilty	25 00	
Jan. 4	E. C. Seely	Catching steelheads out of season	Guilty	10 00	
Jan. 4	Frank Ridding	Catching steelheads out of season	Guilty	10 00	
Jan. 8	L. Nelmi	Catching steelheads out of season	Guilty	100 00	
Jan. 8	John Hannula	Possession of steelheads out of season	Guilty	50 00	
Feb. 11	R. Keating	Using set net to catch salmon in closed waters	Guilty	50 00	989 30

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
ISLAND COUNTY					
1925 May 15	C. A. Payne	Shipping short fish.	Guilty	\$25 00	
May 16	Albert Wagner	Shipping short fish.	Guilty	25 00	
May 18	C. Martell	Possession of short salmon with intent to sell.	Guilty	25 00	
May 18	C. Martell	Possession of short salmon with intent to sell.	Guilty	25 00	
June 10	Anton Melum	Alien engaged in fishing for crabs.	Guilty	25 00	
June 20	Fred Menzoni	Alien fisherman (trap watchman).	Bail forfeited.	25 00	
June 20	Halvor Johanson	Alien fisherman (trap watchman).	Bail forfeited.	25 00	
June 20	B. Bjerdæen	Alien fisherman (trap watchman).	Bail forfeited.	25 00	
June 26	I. Nelson	Alien fisherman (trap watchman).	Bail forfeited.	25 00	
June 27	Lars Steffenson	Alien fishing	Guilty	10 00	
June 27	Eriek Ostlund	Alien fishing	Guilty	10 00	
June 27	Otto Olmes	Alien fishing	Guilty	10 00	
June 27	Carl Hamrles	Alien fishing	Guilty	10 00	
June 27	Einar Erickson	Alien fishing	Guilty	10 00	
June 27	Nick Dybdahl	Alien fishing	Guilty	10 00	
June 27	Edwin Dverseth	Alien fishing	Guilty	10 00	
June 27	Eric Christopherson	Alien fishing	Guilty	10 00	
June 27	Eric O. Brouvaid	Alien fishing	Guilty	10 00	
June 27	Olaf Amble	Alien fishing	Guilty	10 00	
1928 Mar. 8	Nick Uglesich	Alien fishing	Bail forfeited.	50 00	\$375 00
KING COUNTY					
1925 May 8	Roy Jensen (Wash. Fish & Oyster Co.)	Possession of short salmon.	Guilty	\$10 00	
May 11	Lawrence Dressel (Dressel-Collins Fish Co.)	Possession of short salmon.	Guilty	10 00	
May 26	Sam Abledelf (Palace Fish & Oyster Co.)	Possession of short salmon.	Guilty	10 00	
June 12	Two Houch (M. F. Weise fined for employing)	Alien fishing	Guilty	10 00	
July 3	Sebastian-Stuart Fish Co.	Possession short fish.	Guilty	50 00	
Oct. 8	Dun Miller	Fishing in Duwamish Preserve.	Guilty	96 25	
Oct. 8	Jim Mehis	Fishing in Duwamish Preserve.	Guilty	96 25	
Oct. 8	Tom Pappas	Fishing in Duwamish Preserve.	Guilty	100 00	
Oct. 17	O. Johnson	Fishing in Duwamish Preserve.	Dismissed.	.....

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
KING COUNTY—Continued					
1925					
Oct. 17	I. O. Hall	Fishing in Duwamish Preserve.	Guilty	\$25 00	
Oct. 21	Martin Walters	Fishing in Duwamish Preserve.	Guilty	25 00	
Nov. 20	R. L. Miller	Fishing in Duwamish Preserve.	Guilty	50 00	
Nov. 20	Charles Bennals	Set net in Duwamish Preserve	Guilty	10 00	
Dec. 2	Otto Rose	Fishing with trap illegally.	Bail forfeited.	10 00	
Dec. 3	Frank Martinis	Possession of short salmon.	Guilty	25 00	
Dec. 5	L. Dressel	Possession of short fish for sale.	Guilty	10 00	
Dec. 5	Gus Stoddard	Fishing in Duwamish Preserve.	Dismissed		
Dec. 7	Frank Skans	Possession of short salmon.	Guilty	25 00	
Dec. 10	Ole Hobbt	Possession of short salmon.	Guilty	40 00	
Dec. 10	Ralph Genthner	Possession of short salmon.	Guilty	50 00	
Dec. 18	John Pruisler	Garfing salmon	Guilty	25 00	
Dec. 18	Paul McKiddy	Garfing salmon	Guilty	25 00	
Dec. 22	John Seidermeyer	Gill netting in Duwamish Preserve.	Guilty	50 00	
Dec. 25	William Hammala	Possession of salmon during closed season.	Guilty	75 00	
Dec. 27	W. H. Nickson	Garfing salmon	Guilty	10 00	
Dec. 30	John Alexis	Fishing with gill net in Duwamish Preserve.	Guilty	50 00	
1926					
Jan. 3	C. C. Blaker	Garfing salmon	Guilty	\$10 00	
Jan. 3	M. Fuller	Garfing salmon	Juvenile, not filed.		
Jan. 3	C. Fuller	Garfing salmon	Juvenile, not filed.		
Jan. 3	J. Fuller	Garfing salmon	Guilty	10 00	
Jan. 3	G. L. Gamble	Garfing salmon	Dismissed		
Jan. 3	Harry Billman	Garfing salmon	Dismissed		
Jan. 3	Walter Billman	Garfing salmon	Dismissed		
Jan. 3	Harry Hack	Gill netting in Duwamish Preserve.	Guilty	10 00	
Jan. 4	L. Levy	Wholesale fish without license.	Guilty	100 00	
Jan. 5	Claude Wilos	Garfing salmon	Guilty	25 00	
Jan. 10	Edgar Wilos	Garfing salmon	Guilty	25 00	
Jan. 17	Geo. Neherent	Garfing salmon	Guilty	5 00	\$1,007 50
KITSAP COUNTY					
1925					
April 6	F. W. Jones	Catching short salmon	Guilty	\$25 00	
May 14	Ed. Olson	Digging clams out of season	Guilty	60 00	
June 25	Nick Zusrich	Possession of clams during closed season.	Guilty	80 00	
Aug. 20	J. Baizer	Digging clams out of season.	Guilty	28 75	
Sept. 22	Fred L. Fournaine	Shipping and selling clams without license.	Guilty	10 00	
Sept. 22	E. Ugenfritz	Digging and selling clams without license.	Guilty	10 00	

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
KITSAP COUNTY—Continued					
1925					
Nov. 1	Thomas Chamberlin	Gaffing salmon	Guilty	\$10 00	
Nov. 1	Fred L. Gordon	Gaffing salmon	Guilty	10 00	
Nov. 10	Johnny Tornensis	Possession of fish taken illegally	Guilty	10 00	
Nov. 10	M. Olson	Gaffing salmon	Guilty	10 00	
Nov. 10	Eino Vistalo	Gaffing salmon	Guilty	2 50	
Nov. 10	O. Peterson	Gaffing salmon	Guilty	7 50	
Nov. 11	Peter McLean	Using net with less than 1 1/4 inch mesh	Guilty	100 00	
Nov. 12	P. F. Cheplack	Stoning salmon	Guilty	12 50	
Nov. 12	N. W. Cheplack	Stoning salmon	Guilty	12 50	
Dec. 15	A. H. Johnson	Failure to display license number	Guilty	15 00	
Dec. 18	J. S. Hansen and Crew	Fishing in closed waters	Dismissed	15 00	
1926					
Jan. 1	L. M. Van Zandt	Gaffing salmon	Guilty	10 00	
Feb. 2	J. Wada	Alien fishing	Guilty	50 00	
Feb. 2	M. Nagasabu	Alien fishing	Guilty	50 00	
Feb. 3	Clarence Larson	Set lines with too many hooks	Not guilty		
Feb. 3	Lawrence Olson	Set lines with too many hooks	Guilty	15 00	
Feb. 3	Lief Olson	Set lines with too many hooks	Guilty	25 00	
Feb. 17	Clarence Olson	Set lines with too many hooks	Guilty	35 00	
Feb. 19	G. Rerecich	Fishing with longer net than had license for	Guilty	50 00	\$638 75
MASON COUNTY					
1925					
July 29	R. G. Coldwell	Flebing in closed water with dip net	Guilty	\$10 00	
July 29	Chas. L. Hall	Fishing in closed water with dip net	Guilty	10 00	
July 29	R. W. Craig	Fishing in closed water with dip net	Guilty	10 00	
Nov. 8	Frank Aust	Gaffing salmon	Guilty	10 00	
Nov. 9	O. W. White	Gaffing salmon	Guilty	25 00	
Nov. 9	O. M. Giner	Gaffing salmon	Guilty	25 00	
Nov. 11	I. Richardson	Gaffing salmon	Guilty	25 00	
Nov. 11	A. Fields	Gaffing salmon	Guilty	25 00	
Nov. 12	F. M. Bennett	Gaffing salmon	Guilty	25 00	
Nov. 12	F. S. King	Gaffing salmon	Guilty	25 00	
Nov. 13	Lloyd Lindstrom	Gaffing salmon	Guilty	25 00*	
Nov. 13	Ray Lindstrom	Gaffing salmon	Guilty	25 00*	
Nov. 14	Rex Powers	Gaffing salmon	Guilty	6 00	
Nov. 14	J. H. Bankuy	Gaffing salmon	Guilty	10 00	
Nov. 24	Chester Person	Fishing with less than 1 1/4 inch mesh	Guilty	100 00*	
Nov. 24	Henry Camers	Fishing with less than 1 1/4 inch mesh	Guilty	100 00*	455 00

* Appealed.

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
PACIFIC COUNTY					
1925	G. P. Henderson	Buying fish without license.	Guilty	Costs	
May 14	Amos Larson	Buying fish without license.	Guilty	Costs	
May 14	Hugh Gullin	Buying fish without license.	Guilty	Costs	
May 16	Clarence Green	Making false affidavit regarding residence.	Guilty	Disappeared	
Sept. 2	Martin Talus	Fishing with set net above dead line.	Guilty	\$100.00	
Sept. 2	Mike Talus	Fishing with set net above dead line.	Dismissed		
Sept. 2	John Masters	Alien fishing.	Guilty	25.00	
Sept. 14	Victor Nelme	Possession of illegal salmon.	Guilty	25.00	
Sept. 14	John A. Bamer	Fishing above dead line.	Guilty	100.00	
Sept. 17	William Church	Fishing with set nets above dead line.	Guilty	100.00	
Sept. 17	Carl Eastenson	Possession of short salmon.	Guilty	37.50	
Sept. 17	Chas. Matson	Possession of short salmon.	Guilty	37.50	
Sept. 17	Frans Johnson	Possession of short salmon.	Guilty	37.50	
Sept. 17	K. Jerstrom	Possession of short salmon.	Guilty	37.50	
Sept. 18	Moses Lugnet	Possession of short salmon.	Guilty	50.00	
Oct. 1	F. C. Barnes & Co.	Possession of short fish.	Guilty	50.00	
Oct. 1	P. Shelse	Fishing illegally.	Guilty	35.00	
Oct. 15	W. T. Alphan	Fishing with set net above dead line.	Guilty	100.00	
Nov. 5	E. R. Griffin	Fishing with set nets clear across river.	Guilty	100.00	
Nov. 5	W. O. Ross	Fishing with set nets clear across river.	Guilty	100.00	
Nov. 5	A. L. Howard	Fishing with set nets clear across river.	Guilty	100.00	
Nov. 5	John O'Rourke	Set net clear across river and set wrong.	Guilty	25.00	
Nov. 6	Torald Trondson	Possession of illegal salmon.	Guilty	100.00	
Nov. 6	John Klauman	Alien fisherman on trap.	Guilty	50.00	
Nov. 7	Walter Williams	Fishing with too long lead on pound net.	Guilty	100.00	
Nov. 7	C. Williams	Fishing with set net clear across river.	Guilty	25.00	
Nov. 7	A. Prekett	Fishing with set net clear across the river.	Guilty	25.00	
Nov. 7	Ed. Perry	Fishing with set net above dead line.	Guilty	50.00	
Nov. 24	E. Haatja	Fishing trap with lead over 500 feet long.	Guilty	50.00	
Nov. 24	F. J. Girt	Fishing trap with lead over 500 feet long.	Guilty	50.00	
Nov. 24	Tom Mosny	Fishing trap with lead over 500-foot long.	Guilty	100.00	
1926	William Mason	Digging and selling clams without license.	Guilty	10.00	
Mar. 1	Joe Mason	Digging and selling clams before season.	Guilty	10.00	
Mar. 1	Vernon Lane	Digging clams out of season and no license.	Guilty	10.00	
Mar. 1	Angus Beatty	Digging clams out of season and no license.	Guilty	10.00	
Mar. 1	W. H. Cox	Digging clams without license.	Guilty	25.00	
Mar. 11	John Heckard, Jr.	Digging clams without license.	Guilty	25.00	
					\$1,700.00

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
PIERCE COUNTY					
1925					
May 26	John Suhr	Catching and selling salmon without license.	Suspended sentence	\$10 00	
May 29	Superior Fish Co.	Possession of short salmon.	Guilty	10 00	
May 29	National Fish Co.	Possession of claims out of season.	Guilty	50 00	
June 17	Clenn Zinkosky	Fishing without license in closed waters.	Guilty	25 00	
June 18	D. Fujita	Retailing fish without a license.	Guilty	15 00	
July 18	R. Crooks	Possession of fish with intent to sell without license.	Guilty	2 50	
July 18	Geo. Freeman	Possession of fish with intent to sell without license.	Guilty	7 50	
Oct. 7	C. Rostrom	Gaming salmon	Guilty	21 00	
Oct. 11	Hiram G. Lattin	Fishing with illegal gear.	Guilty	7 50	
Oct. 21	J. W. McGee	Gaming salmon	Guilty	22 50	
Oct. 21	T. J. Rasmussen	Gaming salmon	Guilty	22 50	
Oct. 21	Philip Orvardo	Gaming salmon	Guilty	5 00	
Oct. 27	Jim and Clarence Ball	Gaming salmon	Guilty	7 50	
Oct. 27	L. Truit	Gaming salmon	Guilty	22 50	
Oct. 27	T. V. Young	Gaming salmon	Guilty	7 50	
Oct. 27	Phllman Jackson	Gaming salmon	Guilty	7 50	
Oct. 30	Ralph Shook	Illegally fishing with lights.	Guilty	45 50	
Oct. 30	John Hanson	Gaming salmon	Guilty	25 00	
Oct. 31	T. G. Sulway	Spearing salmon	Guilty	25 00	
Oct. 31	H. Baereman	Gaming salmon	Guilty	25 00	
Nov. 20	George Harris	Gaming salmon	Guilty	10 00	
Nov. 20	Ray Smith	Gaming salmon	Guilty	20 00	
Nov. 30	Pacific Fish Co.	Possession of salmon for sale during closed season.	Guilty	25 00	
Nov. 30	Sanitary Oyster & Fish Co.	Possession of salmon for sale during closed season.	Guilty	25 00	
Dec. 2	Wholochet Mill Co.	Dumping sawdust into bay.	Guilty	50 00	
Dec. 3	Nick Milosevich	Buying fish without license.	Guilty	50 00	
Dec. 3	Mike Katich	Buying fish without license.	Guilty	25 00	
Dec. 3	Paul Martins	Buying short fish	Guilty	25 00	
Dec. 3	Frank Tomastch	Buying short fish	Guilty	25 00	
Dec. 3	Andrew Rasmussen	Buying short fish	Guilty	25 00	
Dec. 3	Nick Milosevich	Buying short fish	Guilty	25 00	
Dec. 3	Mike Katich	Buying short fish	Guilty	10 00	
Dec. 10	John Adams	Using 48 more feet on seine than license called for.	Not guilty		
Dec. 15	A. McLeod	Fishing in Nisqually River with set net.	Guilty	10 00	
Dec. 18	John Simlicch	Gaming salmon	Guilty	10 00	
Dec. 18	John Rader	Gaming salmon	Guilty	10 00	
Dec. 18	Walter Cronogo	Gaming salmon	Guilty	10 00	
Dec. 18	William Case	Casting sawdust into water.	Guilty	10 00	
Dec. 22	Nakamura Fish Co.	Operating a market without a license.	Guilty	48 00	

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
PIERCE COUNTY—Continued					
1925					
Dec. 22	L. T. Greely	Gaffing salmon	Guilty	\$7 50	
Dec. 23	J. C. Boldt	Possession of salmon less than 18 inches in length.	Guilty	Coets	
Dec. 23	Ray Dornan	Gaffing salmon	Guilty	10 00	
Dec. 23	Lloyd Browning	Gaffing salmon	Guilty	10 00	
Dec. 23	L. Browning	Gaffing salmon	Guilty	10 00	
1925					
Jan. 5	G. Marina (Pioneer Fish Co.)	Possession of short salmon.	Guilty	75 00	
Jan. 8	Gus Freeman	Fishing with set net.	Guilty	50 00	
Jan. 9	Northern Fish Co.	Possession of salmon taken in closed waters.	Guilty	100 00	
Jan. 9	G. M. Wray	Illegal possession of salmon.	Guilty	30 days In jail	\$1,047 50
SAN JUAN COUNTY					
1925					
July 23	Peter Stanovich	Alien fishing	Guilty	\$20 00	
July 23	Matt Plencovich	Alien fishing	Guilty	20 00	
July 23	Pete Dragovitch	Alien fishing	Guilty	20 00	
July 22	Pete Zankich	Alien fishing	Guilty	20 00	
July 23	Paul Plencovich	Alien fishing	Guilty	20 00	
July 23	Norman Andrisero (Anderson)	Alien fishing	Guilty	20 00	
July 23	Alfred Hansen	Alien fishing	Guilty	20 00	
July 23	J. B. Peterson	Alien fishing	Guilty	20 00	
July 24	Henry Nelson	Alien fishing	Guilty	20 00	
July 24	Mike Barcott	Alien fishing	Guilty	20 00	
July 24	John Ostad	Alien fishing	Guilty	20 00	
July 24	Ambro Stub	Alien fishing	Guilty	20 00	
July 24	Ed. Johnson	Alien fishing	Guilty	20 00	
July 24	Visko Lashch	Alien fishing	Disappeared		
July 25	Andrew Hansen	Alien fishing	Disappeared		
July 25	Gust Wick	Alien fishing	Not guilty		
July 25	Harold Swanson	Alien fishing	Guilty	5 00	
July 25	Sam Dragovitch	Alien fishing	Guilty	5 00	
July 25	Sam Babich	Alien fishing	Guilty	5 00	
July 25	Rocco Vrognyan	Alien fishing	Guilty	5 00	
July 25	Geo. Tesolath	Alien fishing	Guilty	5 00	
Aug. 29	Mike Trutch	Alien fishing	Guilty	5 00	
Aug. 29	Dominic Sulka	Alien fishing	Guilty	5 00	

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
SAN JUAN COUNTY—Continued					
1925	Nick Vukov	Alien fishing	Guilty	\$5 00	
Aug. 29	Lucas Glovich	Alien fishing	Guilty	5 00	
Aug. 29	Nick Uras	Alien fishing	Guilty	5 00	
Aug. 29	Louie Trifevich	Alien fishing	Guilty	5 00	
Aug. 29	Anton Rakembauer	Alien fishing	Guilty	5 00	
Aug. 29	Anton Surjan	Alien fishing	Guilty	5 00	
Sept. 4	Christ Lacos	Alien fishing	Guilty	Pending	\$800 00
SKAGIT COUNTY					
1925	F. H. Mann	Fishing during closed season.	Guilty	\$25 00	
April 20	Robert Hickey	Illegal possession of fish.	Guilty	100 00	
April 22	S. R. Usher	Fishing during closed season.	Guilty	50 00	
April 27	Frank Martinis	Selling fish in closed season.	Guilty	100 00	
April 28	Frank Martinis	Selling fish in closed season.	Guilty	100 00	
April 28	Noble Lee	Interfering with an officer.	Not guilty		
May 8	Oscar Arset	Alien trap watchman.	Guilty	12 50	
May 16	Axel Jensen	Alien trap watchman.	Guilty	12 50	
May 16	Dominick Surjan	Fishing in closed waters.	Dismissed		
Oct. 8	Mike Butle	Fishing in closed waters.	Dismissed		
Oct. 8	Ernest Barsarovich	Fishing in closed waters.	Dismissed		
Oct. 8	Dick Surjan	Fishing in closed waters.	Dismissed		
Oct. 8	Nick Bozanich	Fishing in closed waters.	Dismissed		
Oct. 8	Frank Bozanich	Fishing in closed waters.	Dismissed		
Oct. 8	Paul Bozanich	Fishing in closed waters.	Dismissed		
Oct. 9	Tony Mardesich	Fishing in closed waters.	Dismissed		
Oct. 9	John Babarovich, Sr.	Fishing in closed waters.	Dismissed		
Oct. 9	John Babarovich, Jr.	Fishing in closed waters.	Dismissed		
Oct. 9	Fete Burich	Fishing in closed waters.	Dismissed		
Oct. 9	Mike Francin	Fishing in closed waters.	Dismissed		
Oct. 9	Fete Mardesich	Fishing in closed waters.	Dismissed		
Oct. 9	Fete Sardesich	Fishing in closed waters.	Dismissed		
Oct. 12	John Tasovac	Fishing in closed waters.	Dismissed		
Oct. 12	Nick Tasovac	Fishing in closed waters.	Dismissed		
Oct. 12	Dick Tasovac	Fishing in closed waters.	Dismissed		
Oct. 12	Robert Wiggins	Fishing in closed waters.	Dismissed		
Oct. 12	Spiro Sprnych	Fishing in closed waters.	Dismissed		
Oct. 12	Charles Wedlund	Fishing in closed waters.	Dismissed		
Oct. 12	Peta Antonivich	Fishing in closed waters.	Dismissed		

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
SKAGIT COUNTY—Continued					
1925					
Oct. 12	Frank Barcott	Fishing in closed waters	Dismissed	Pending	
Oct. 12	Pete Dugovich	Fishing in closed waters		Pending	
Oct. 12	Anton Burcott	Fishing in closed waters		Pending	
Oct. 12	Nick Andrich	Fishing in closed waters		Pending	
Oct. 12	Tully Scharovich	Fishing in closed waters		Pending	
Oct. 12	Nick Novak	Fishing in closed waters		Pending	
Oct. 12	Joe Matlak	Fishing in closed waters		Pending	
Oct. 16	Dominik Radtsch	Fishing in closed waters		Pending	
Oct. 16	Luca Radich	Fishing in closed waters		Pending	
Oct. 16	Nick Radomich	Fishing in closed waters		Pending	
Oct. 16	Nick Nicolich	Fishing in closed waters		Pending	
Oct. 16	Marvin Raich	Fishing in closed waters		Pending	
Oct. 16	Berry Auerch	Fishing in closed waters		Pending	
Oct. 16	Nick Zafarin	Fishing in closed waters		Pending	
Dec. 1	Geo. H. Draper	Taking and selling short crabs	Guilty	\$10 00	
1925					
Jan. 4	Melvin Omundsen	Fishing in closed waters	Guilty	10 00	
Jan. 4	Harry Hammond	Fishing in closed waters	Guilty	10 00	
Feb. 2	John Hekenberg	Taking crabs without license	Guilty	25 00	
Feb. 2	Dick Surjan	Taking crabs without license	Guilty	10 00	
Feb. 2	Harold Burgett	Taking crabs without license	Guilty	10 00	\$475 00
SNOHOMISH COUNTY					
1925					
June 12	Carl Kirkus (Everett Fish Co.)	Possession of short salmon	Guilty	\$25 00	
Aug. 17	Faul Martinis	Fishing in closed waters	Guilty	100 00	
Sept. 13	Emanuel Olson	Gaffing salmon	Guilty	5 00	
Sept. 15	John Franciscovich	Fishing in closed waters	Guilty	25 00	
Sept. 22	Chris Anderson	Fishing in closed waters	Guilty	50 00	
Sept. 22	Chas. Pedersen	Fishing in closed waters	Guilty	50 00	
Sept. 22	Mike Mikelsen	Fishing in closed waters	Guilty	50 00	
Sept. 22	Geo. Bakken	Fishing in closed waters	Guilty	50 00	
Sept. 22	Osmund Nelson	Fishing in closed waters	Guilty	50 00	
Sept. 22	Chris Christensen	Fishing in closed waters	Guilty	50 00	
Sept. 22	J. P. Johnson	Fishing in closed waters	Guilty	50 00	
Sept. 29	Chris Olsen	Fishing in closed waters	Guilty	100 00	
Sept. 29	Albert Moistad	Fishing in closed waters	Guilty	10 00	
Oct. 12	Iver Stensaa	Fishing in closed waters	Not guilty		
Oct. 12		Fishing in closed waters	Guilty	25 00	

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
SNOHOMISH COUNTY—Continued					
1925 Oct. 19	Arthur Sands	Fishing in closed waters.	Dismissed		
Oct. 18	S. W. Lewis	Smuggling salmon	Ball forfeited	\$25 00	
Oct. 18	P. Sands	Fishing in closed waters.	Dismissed		
Oct. 22	Erik Taugen	Fishing in closed waters.	Guilty	25 00	
Oct. 23	Olaf Matson	Fishing in closed waters.	Guilty	25 00	
1926 Mar. 20	P. E. Ingerham	Gaffing salmon	Guilty	5 00	\$670 00
THURSTON COUNTY					
1925 Nov. 12	Antony Zukosky	Fishing with gill net less than 5% inch mesh.	Guilty	\$100 00	
Nov. 12	Clem Zukosky	Fishing with gill net less than 5% inch mesh.	Guilty	100 00	
Nov. 13	John Gill	Gaffing salmon	Guilty	10 00	
Nov. 13	Olaf Kuren	Gaffing salmon	Guilty	10 00	
Nov. 13	Chester Warner	Gaffing salmon	Guilty	10 00	
Nov. 13	S. A. Howard	Gaffing salmon	Guilty	10 00	
Nov. 13	J. E. Howard	Gaffing salmon	Guilty	10 00	
Nov. 13	Lee Conner	Gaffing salmon	Guilty	10 00	
Nov. 14	R. W. Austin	Gaffing salmon	Guilty	10 00	
Nov. 15	F. E. Wambult	Gaffing salmon	Guilty	15 70	
Nov. 15	S. G. King	Gaffing salmon	Guilty	10 00	
Nov. 15	R. E. Norris	Attempt to gaff salmon.	Guilty	10 00	
Nov. 15	C. A. Maty	Gaffing salmon	Guilty	10 00	
1926 Jan. 14	Folta & Monroe	Possession of illegal salmon.	Guilty	25 00	
Jan. 14	J. Zamberlin	Possession of illegal salmon.	Guilty	25 00	
Jan. 14	John Damania	Possession of illegal salmon.	Guilty	25 00	390 70
WAHIAKUM COUNTY					
1925 Aug. 4	Knute Nilzen	Trap fishing during closed season.	Guilty	\$250 00	
Aug. 20	Vasco Bogdanovitch	Making false affidavit as to citizenship papers.	Guilty	100 00	
Aug. 27	Nels G. Nelson	Fishing during closed season	Guilty	25 00	
Sept. 9	Hjalmar Johnson	Fishing during closed season	Dismissed		
Sept. 9	Hjalmar Johnson	Fishing during closed season	Dismissed		
Sept. 9	John C. Peterson	Fishing during closed season	Guilty	50 00	
Sept. 9	Knute Nelson	Fishing during closed season.	Dismissed		
Dec. 5	J. A. Shabert	Fishing without license.	Guilty	10 00	435 00

ARRESTS MADE FOR VIOLATIONS OF THE FOOD FISH LAWS—Concluded
Fiscal Year 1925.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
WHATOOM COUNTY					
1925					
July 24	John Danielson	Alien fishing	Guilty	\$20 00	
July 26	Sid Haugen	Alien fishing	Guilty	20 00	
July 26	M. Asrad	Alien fishing	Guilty	20 00	
July 27	Louis Spencer	Alien fishing	Disappeared		
July 28	Kristjan Falsson	Alien fishing	Guilty	20 00	
July 29	Geo. Koistad	Alien fishing	Guilty	20 00	
July 29	Fall G. Thorsen	Alien fishing	Guilty	20 00	
July 30	Torgen Sandhaaland	Alien fishing	Guilty	20 00	
July 30	Peter Acalinovich	Alien fishing	Guilty	20 00	
July 30	John Nelson	Alien fishing	Guilty	20 00	
July 30	Severin Fagerland	Alien fishing	Guilty	20 00	
July 30	Geo. Johnson	Alien fishing	Guilty	20 00	
July 30	Andrew Norwad	Alien fishing	Guilty	20 00	
July 30	Anton Johansen	Alien fishing	Guilty	20 00	
July 30	Radenvald Johnson	Alien fishing	Guilty	20 00	
July 30	Hakon Mednag	Alien fishing	Guilty	20 00	
July 30	A. Olmson	Alien fishing	Guilty	20 00	
Oct. 2	C. E. McCurdy	Fishing without license	Guilty	20 00	
Oct. 22	Nick Vitalije	Fishing in closed waters	Not guilty		
Oct. 22	Don Stanovitch	Fishing in closed waters	Not guilty		
Oct. 22	Tony Elch	Fishing in closed waters	Not guilty		
Oct. 22	Frank Borotovich	Fishing in closed waters	Not guilty		
Oct. 22	E. Mariani	Fishing in closed waters	Not guilty		
Oct. 22	Nick Kareeja	Fishing in closed waters	Not guilty		
Oct. 22	Nick Repanich	Fishing in closed waters	Not guilty		
Oct. 22	Anton Cherkov	Fishing in closed waters	Not guilty		
Oct. 22	Pete Bozianich	Fishing in closed waters	Not guilty		
Oct. 22	George Korgan	Fishing in closed waters	Not guilty		
Oct. 22	Kuzma Zivela	Fishing in closed waters	Not guilty		
Oct. 22	John Finetich	Fishing in closed waters	Not guilty		
Oct. 22	Paul E. Vidovich	Fishing in closed waters	Not guilty		
Oct. 22	Nick Fetrenavich	Fishing in closed waters	Not guilty		
Oct. 22	Tony Zorovitch	Fishing in closed waters	Not guilty		
Oct. 30	Ivan James	Fishing without license in closed waters	Guilty	50 00	
Dec. 1	Vlase Marinovich	Catching and selling short crabs	Guilty	10 00	
Dec. 17	Max Ouley	Fishing with other than hook and line for personal use	Guilty	15 00	
1926					
Feb. 4	Dome Moskovita	Possession of short crabs	Guilty	50 00	
Feb. 9	Frank Bies	Taking crabs without license	Guilty	10 00	
Feb. 15	C. E. Anderson	Fishing with gill net in closed waters	Guilty	50 00	
Feb. 18	Tony Marinovich	Alien fishing for crabs	Guilty	25 00*	
Mar. 8	Nick Zuanich	Alien fishing for crabs	Guilty	20 00	
TOTAL FINES					\$970 00
					\$10,370 25

* Suspended.

NUMBER AND VALUE OF CANNERIES AND FACTORIES OPERATED, AND THEIR FISHING APPLIANCES, AND CAPITAL INVESTMENTS, INCLUDING PLANTS OPERATED BY WHOLESALE DEALERS AND PROCESSORS.
Fiscal Year 1925.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Canneries, salmon (buildings and machinery).	26	\$1,361,132 92	10	\$665,227 92	4	\$33,899 20	1	\$25,000 00	41	\$2,075,260 04
Factories, by-products.	6	11,750 00	6	.....	6	26,196 00	7	42,486 41	19	80,431 41
Warehouses, cold storages, smoke houses, packing plants, fuel houses, residences for labor, real estate.	3	137,000 00	.....	.....	.....	.....	.....	.....	3	137,000 00
Automobiles, trucks and other land conveyances.	.....	2,133,773 59	.....	395,301 39	.....	5,415 00	.....	2,525 00	.....	2,537,514 98
Steamboats.	77	53,178 91	6	6,491 64	13	3,737 00	7	1,550 00	103	64,967 55
Launches.	10	236,230 06	.....	.....	.....	.....	.....	.....	10	236,230 06
Pile drivers or pullers.	31	118,121 69	14	41,422 41	2	200 00	1	850 00	48	160,594 10
Scows.	21	116,329 58	3	5,179 07	.....	.....	2	5,000 00	23	126,508 65
Cannery tenders.	167	141,566 72	21	17,071 60	5	4,850 00	.....	.....	193	163,458 32
Fishing boats.	23	293,810 06	5	21,888 33	2	5,200 00	.....	.....	30	320,698 94
Buyer's boats.	20	94,679 32	59	69,759 49	2	400 00	2	500 00	92	165,339 81
Round net locations operated.	5	22,197 94	4	4,300 00	.....	.....	.....	.....	9	26,997 04
Pound net locations not operated.	107	963,973 89	22	42,816 61	2	868 25	8	6,500 00	139	1,014,158 75
Stationary or scow fish wheels.	37	145,237 82	14	19,720 00	2	200 00	4	4,000 00	57	159,457 82
Nets and seines.	8	671 11	103	19,720 00	2	100 00	.....	250 00	115	19,720 00
Miscellaneous equipment.	13	94,500 00	118	16,597 76	7	150 00	.....	.....	138	123,811 87
Total invested in plant and equipment.	.....	\$6,272,665 37	.....	\$1,464,322 55	.....	\$37,031 59	.....	\$30,961 41	.....	\$7,914,980 91
Operating expenses.	.....	8,890,959 08	.....	2,576,544 40	.....	558,720 04	.....	136,333 38	.....	12,201,596 90
Grand total capital invested.	.....	\$15,153,664 45	.....	\$4,040,866 95	.....	\$945,751 62	.....	\$276,294 79	.....	\$20,116,577 81

NOTE—The above figures do not include valuations of the floating gear and equipment or the fixed appliances owned and operated independent of the operators whose reports make up the above statement.

NUMBER AND EARNINGS OF LABORERS EMPLOYED IN OPERATION OF CANNERIES, FACTORIES, WHOLESALE AND PROCESSING PLANTS AND THEIR APPLIANCES.
Fiscal Year 1926.

	PUGET SOUND DISTRICT			COLUMBIA RIVER DISTRICT			GRAYS HARBOR DISTRICT		
	Number Em- ployed	Average Season's Earnings	Total Earnings	Number Em- ployed	Average Season's Earnings	Total Earnings	Number Em- ployed	Average Season's Earnings	Total Earnings
Clerical Capacity—									
Male	111	\$2,428 87	\$283,604 25	25	\$2,260 08	\$56,741 97	31	\$765 66	\$23,735 53
Female	37	1,419 16	52,509 01	7	1,652 51	7,307 58	18	202 34	3,642 03
Operating canneries, factories, warehouses, etc.	886	766 04	640,412 47	188	772 41	145,212 90	137	223 53	31,445 31
White labor—male	679	177 16	120,248 20	134	376 86	50,459 55	207	97 83	20,250 24
White labor—female	4-2	514 21	247,851 28	247	665 50	164,378 78	18	414 83	7,467 00
Oriental labor	169	115 95	19,594 74	.....	.....	.....	21	210 24	4,415 00
Indian labor	.....	.....	.....	.....	.....	.....	.....	.....	.....
Operating pile drivers, pullers, boats, scows nets and other fishing appliances	667	690 50	460,562 28	45	953 77	42,919 76	5	923 45	1,617 23
Miscellaneous labor	127	1,248 28	158,531 85	26	545 45	14,259 60	36	119 49	4,301 70
Totals	3,108	\$633 64	\$1,069,359 08	672	\$716 34	\$481,380 14	473	\$204 80	\$96,874 07

	WILLAPA HARBOR DISTRICT			ALL DISTRICTS COMBINED		
	Number Em- ployed	Average Season's Earnings	Total Earnings	Number Em- ployed	Average Season's Earnings	Total Earnings
Clerical Capacity—						
Male	2	\$757 96	\$1,515 92	169	\$2,080 46	\$351,597 67
Female	2	352 50	705 00	64	1,003 49	64,223 62
Operating canneries, factories, warehouses, etc.—						
White labor—male	47	325 85	15,315 00	1,208	659 06	832,885 68
White labor—female	51	184 84	9,427 01	1,071	165 96	200,470 00
Oriental labor	12	208 33	2,540 00	1,759	556 24	422,197 06
Indian labor	.....	.....	.....	180	126 36	24,009 74
Operating pile drivers, pullers, boats, scows, nets and other fishing appliances	6	166 07	1,000 00	723	619 99	506,009 80
Miscellaneous labor	20	121 68	2,433 54	200	868 98	179,528 69
Totals	140	\$634 97	\$82,806 47	4,333	\$687 41	\$2,850,509 76

OUTPUT OF THE PRIVATE FISH HATCHERIES.

Fiscal Year 1925.

Spawn sold	2,653,498
Fry sold	125,498
Fish sold	18,436

Dealers' purchases of hatchery fish from outside the state.....	9,227 pounds
Purchases of hatchery fish by Washington restaurants.....	1,521 pounds

(Due to the provisions in the Game Code enacted during the last session of the Legislature, the State Game Department will license all fish hatcheries maintained for the hatching and rearing of all kinds of game fish. This department then would only license hatcheries which handle salmon. C. R. P.)

STATISTICS

FOR

FISCAL YEAR 1926

April 1, 1926, to March 31, 1927

DIVISION OF FISHERIES

Department of Fisheries
and Game

STATE OF WASHINGTON

Appropriations, Receipts and Disbursements; Output of Salmon
Hatcheries and Costs; Licenses Issued; Take and
Value of Food Fishes; and Other Information
Regarding the Food Fishing Industry.

APPROPRIATION AND EXPENDITURES OF FISHERIES FUND.

Fiscal Year 1926.

FUND		Appropriation for One Year	Expended Fiscal Year 1926	Balance April 1, 1927
Salaries of director, supervisor of fisheries, inspectors and employes; traveling expenses of director, supervisor, inspectors and employes; rent and incidentals; construction, repair, rearing and maintenance of salmon hatcheries, construction of new hatcheries; patrol service; improvements, replacements; destruction of seals; printing and other necessary expenses of the office of the supervisor of fisheries.....		\$250,000 00	\$210,406 89*	\$79,593 11

*It will be noted in checking the net expenditures of the department given above that the total is \$4,000.00 less than the total shown in the Auditor's records. This is for the reason that an item of \$2,000.00 is used as a revolving fund each period and is charged against the department, but is always returned to the State Treasurer before the close of the period. During the fiscal year 1926 there was also a special revolving fund of \$2,000.00 to handle Alaska operations.

ITEMIZATION OF EXPENDITURES OF FISHERIES FUND.

	Salaries	Labor	Mileage	Subsistence	General Expense	Maintenance	Improvements	Total Cost of Operation
Office expense	\$10,142 41		\$672 07	\$426 15	\$4,786 91	\$11 56	\$652 95	\$16,716 04
Repairs and maintenance of hatcheries.....	24,866 43	39,979 76	838 54	1,252 90	12,480 54	830 32	33,287 71	113,604 90
Patrol service	20,140 38	7,045 59	6,944 42	9,030 79	7,836 03	5,155 96	13,186 94	68,979 15
Sundry expense	692 00	96 00	104 88	275 45	244 66	57 94	.....	1,560 93
Biological	1,051 06	155 00	225 11	472 70	726 67	283 82	.....	2,914 36
Alaska	477 42	574 74	1,044 39	147 40	1,158 66	1 50	42 40	3,446 51
Destruction of seals.....	.....	.....	.....	.....	3,285 00	.....	.....	3,285 00
Totals.....	\$57,369 70	\$47,935 00	\$9,979 41	\$11,935 09	\$30,027 47	\$6,341 09	\$47,149 04	\$210,406 89

SEGREGATION ON REPAIRS, MAINTENANCE AND IMPROVEMENTS (CAPITAL OUTLAY) OF SALMON HATCHERIES.

	Salaries	Labor	Mileage	Subsistence	General Expense	Maintenance	Improvements	Total Cost of Operation	Total Eggs Taken	Total Fish Reared	Cost Per Thousand
Repairs and maintenance.....	\$17,696 43	\$2,155 76	\$91 69	\$907 25	\$9,611 19	\$375 82	.....	\$51,458 14	141,635,483	.....	\$ 363
New construction.....	3,820 00	13,728 00	184 35	155 85	1,930 00	.....	\$51,048 06	50,511 26	.....	.....	.....
Rearing expense	1,800 00	3,708 00	10 00	84 00	612 00	326 00	2,060 00	9,080 00	.....	32,167,900	.287
Salt water pond.....	1,380 00	880 00	12 50	15 50	27 35	118 50	141 65	2,575 50	.....	1,300,000	.193
Totals.....	\$24,866 43	\$39,979 76	\$368 54	\$1,262 60	\$12,480 54	\$830 32	\$33,287 71	\$113,604 90	.....	.....	.....

APPROPRIATION AND EXPENDITURES OF STATE OYSTER RESERVE FUND.
Fiscal Year 1926.

FUND	Appropriation for One Year	Expended Fiscal Year 1926	Balance April 1, 1927
For the improvement and protection of the state oyster reserves	\$9,000 00	\$4,943 40	\$4,056 60

ITEMIZATION OF EXPENDITURES OF STATE OYSTER RESERVE FUND.

Patrol	\$2,857 73
Improvement of oyster beds.....	2,086 67
Total.....	\$4,943 40

RECEIPTS OF THE FISHERIES DEPARTMENT.
Fiscal Year 1926.

CREDITED TO THE FISHERIES FUND		Puget Sound District	Columbia River District	Grays Harbor District	Willapa Harbor District	Totals
LICENSES—						
6,726 Fishing	\$21,800 00	\$14,898 00	\$3,291 00	\$3,608 15	\$43,847 24	
215 Buyers at \$1.00	82 00	88 00	29 00	21 00	215 00	
1,082 Retail dealers' at \$1.00	682 00	334 00	45 00	21 00	1,082 00	
118 Wholesale dealers	580 00	380 00	120 00	100 00	1,180 00	
3 Brokers	10 00	10 00	10 00	10 00	30 00	
27 Freezers	210 00	40 00	20 00	.....	270 00
31 Halibut dealers	140 00	15 00	.....	.....	155 00
1 Codfish, canning and curing	5 00	.....	.....	.....	5 00
7 By-products manufacturing	175 00	12 50	.....	.....	175 00
4 Hotel serving private hatchery product	4 00	.....	.....	.....	4 00
32 Salmon canneries	350 00	225 00	125 00	100 00	800 00	
23 Clam canneries	75 00	.....	150 00	130 00	345 00
80 1925 Licenses	78 00	15 00	60 50	17 75	171 25	
8,356 Total					\$43,200 00	
TAXES—						
Catch tax received	\$65,031 16	\$60,578 11	\$5,035 40	\$0,288 75	\$137,925 52	
SALES—						
Sale of eggs	\$140 00	.....	.....	.....	\$140 00
Spawmed fish	7 98	\$888 72	.....	.....	896 70
Confiscated gear	25 00	105 50	\$65 00	.....	165 50
Confiscated fish	105 14	21 02	.....	\$67 79	193 95
Totals					\$1,396 15	
MISCELLANEOUS—						
1925 miscellaneous licenses	\$32 00	.....	\$10 00	\$4 50	\$46 50
1925 extension	4 50	.....	.....	.....	4 50
Transfers	47 00	.....	4 00	3 00	125 00
Miscellaneous	682 06	\$74 00	.....	.....	781 01
Refunds	302 27	100 95	.....	.....	403 25
Refunds	435 51	100 65	13 88	33 28	569 32	
Oregon suspenses*	.....	2,085 20	.....	.....	2,085 20
Tax paid Oregon*	.....	13,283 80	.....	.....	13,283 80
Totals	\$91,888 71	\$94,355 43	\$8,943 87	\$10,650 23	\$206,843 24	

RECEIPTS OF THE FISHERIES DEPARTMENT—Continued.
Fiscal Year 1926.

CREDITED TO THE FISHERIES FUND	Puget Sound District	Columbia River District	Grays Harbor District	Willapa Harbor District	Total
COLLECTIONS REPORTED BY STATE TREASURER—					
Fines.....					\$5,800 55
Interest earnings.....					4,981 96
Sale of public property.....					4,302 00
Miscellaneous.....					4,325 00
Totals.....					\$14,080 54
Total credited to Fisheries Fund.....					\$220,862 78

CREDITED TO THE STATE OYSTER RESERVE FUND	Puget Sound District	Columbia River District	Grays Harbor District	Willapa Harbor District	Total
STATE OYSTER RESERVE FUND—					
11 oyster permits at \$5.00.....	\$25 00				\$25 00
Oysters sold (direct to Treasurer).....	5,223 07				5,223 07
Oyster refunds.....	48 64				48 64
Totals.....	\$5,426 71				\$5,426 71
COLLECTIONS REPORTED BY STATE TREASURER—					
Interest earnings.....					108 00
Secretary Oyster Commission.....					603 44
Commissioner of Public Lands (leases, etc.).....					\$801 44
Totals.....					\$6,288 15
Total credited to Oyster Reserve Fund.....					\$6,288 15
Total receipts.....					\$227,150 93

1 Refunds to Fisheries Department for tax on gasoline used in patrol boats. \$580 32
 2 Refunds to fishing industry for overpayments on licenses and taxes.... 2,985 20
 3 Taxes due Oregon but not paid..... 13,283 80
 4 Tax paid Oregon..... 48 64
 5 Refund for overpayment of oysters..... 48 64

Total refunds \$16,906 96 Total receipts, \$227,150 93. Net receipts, \$210,243 97.

YEARLY COMPARATIVE TABLE OF RECEIPTS.

YEAR	FISHERIES FUND						OYSTER RESERVE FUND				Grand Total
	Licenses	Taxes	Sales	Miscellaneous	Fines and Interest Earnings	Total	Licenses	Sales	Interest Earnings	Total	
1905	\$39,568 20	\$10,587 88		\$471 95		\$50,568 03		\$4,464 00		\$4,464 00	\$55,032 03
1906	41,954 94	2,903 38		204 62		45,122 96		3,766 70		3,766 70	48,889 66
1907	38,588 10	9,154 18				47,742 28		4,204 80		4,204 80	51,947 08
1908	39,884 40	3,812 57				43,696 97		2,389 80		2,389 80	46,086 77
1909	40,802 00	17,069 36		16 80		57,888 16		4,021 65		4,021 65	61,909 81
1910	45,942 90	5,331 91				51,274 81		1,186 00		1,186 00	52,460 81
1911	39,174 90	14,370 19			\$1,010 83	54,555 92		3,682 35		3,682 35	58,238 27
1912	57,752 10	6,100 47				63,852 57		1,632 75		1,632 75	65,485 32
1913	35,519 25	32,405 74		17 50	6,716 37	94,651 96	\$60 00	2,585 90		2,645 90	97,297 86
1914	39,421 70	9,504 16		63 57	2,917 75	71,949 14	5 00	574 37		579 37	72,528 51
1915 (8 months)	48,106 91	29,833 02			332 25	78,940 83	25 00	2,660 80		2,685 80	81,626 63
1916	45,747 61	35,236 05			1,418 70	83,782 56	25 00	970 88	\$114 23	1,109 61	84,892 17
1917 (4 months)	1,835 46	9,265 93		54 38	949 40	12,654 16					12,654 16
1918	56,751 76	65,118 71		31 37	3,981 94	146,223 37	96 00	5,545 79	61 76	5,702 55	152,025 92
1919	48,119 04	36,946 01		234 50	4,387 25	102,011 36	10 00	5,507 34		5,517 34	107,528 70
1920	52,823 23	45,573 91		237 00	6,913 54	123,223 22	65 00	7,870 00	68 38	8,038 38	131,261 60
1921	47,484 87	27,917 02		237 00	7,285 14	86,170 63	80 00	5,491 75		5,571 75	91,742 38
1922	59,587 96	124,004 48		134 63	71 41	175,445 27	65 00	5,717 98	1,377 80	7,095 78	182,541 05
1923	36,102 72	144,820 19		3,063 30	3,027 71	141,215 64	50 00	6,451 29	1,106 00	7,557 29	148,772 93
1924	39,452 85	156,640 64		20,382 98	7,695 32	210,942 24	50 00	6,312 95	1,586 90	7,899 85	218,842 09
1925	46,823 68	192,643 09		26,389 74	8,567 92	233,973 90	35 00	2,512 96		2,547 96	236,521 86
1926	48,286 99	137,925 32		18,221 38	12,068 45	275,483 06	35 00	7,241 17	747 37	7,988 54	283,471 60
1927				18,221 38	14,989 54	220,882 78	55 00	5,371 71	861 44	6,233 15	227,115 93

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LICENSES ISSUED.
Fiscal Year 1926.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DIST.		ALL DISTRICTS COMBINED	
	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected
FISHING LICENSES—										
Round net	219	\$10,750 00	182	\$3,500 00					215	\$10,750 00
Tret class pound net.....		\$50 00							132	3,500 00
Second class pound net.....		25 00	252	3,750 00					252	3,750 00
Round net		15 00							208	3,120 00
Stationary fish wheel.....		35 00							17	595 00
Snow fish wheel.....		25 00							11	275 00
Set net	11	41 25	11	595 00					22	640 25
Gill net.....	361	3,013 90	539	3,975 75					900	6,989 65
Drag seine	130	989 19	47	1,478 25					177	2,467 44
Purse seine	136	3,740 00							136	3,740 00
Reef net	10	50 00							10	50 00
Set line	113	113 00	51	51 00					164	164 00
Hook and line.....	684	1,868 00	109	218 00					793	2,086 00
Dip bag net.....	9	9 00	80	80 00					89	89 00
Snoot drag bag net.....	72	523 21							72	523 21
Brush wawl	18	450 00							18	450 00
Beam trawl	29	290 00							29	290 00
Clams and mussels	242	242 00							242	242 00
Clam bait	2	2 00							2	2 00
Crabs	146	146 00							146	146 00
Gill net boat pulser.....		1 00	156	156 00					156	156 00
Gill net extension.....		47 24								47 24
Drag seine extension.....		7 30								7 30
Snoot drag bag net extension.....		18 10								18 10
TOTALS.....	2,173	\$21,800 09	1,647	\$14,888 00	1,665	\$3,291 00	1,296	\$3,868 15	6,726	\$43,847 24

LICENSES ISSUED—Continued.
Fiscal Year 1926.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DIST.		ALL DISTRICTS COMBINED	
	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected	Number Licenses	Amount Collected
DEALERS AND MISCELLANEOUS LICENSES—										
Buyer's	82	\$32 00	53	\$83 00	29	\$29 00	21	\$21 00	215	\$215 00
Retail dealer's	682	682 00	334	334 00	45	45 00	21	21 00	1,082	1,082 00
Wholesale dealer's	58	580 00	38	380 00	12	120 00	10	100 00	118	1,180 00
Broker	10	10 00	1	10 00	1	10 00	1	10 00	3	30 00
Hotel dealer	21	210 00	4	40 00	2	20 00	.....	.....	27	270 00
Whisper	28	140 00	3	15 00	.....	.....	.....	.....	31	155 00
Halibut dealer	1	5 00	.....	.....	.....	.....	.....	.....	1	5 00
Codfish canning and curing	7	175 00	.....	.....	.....	.....	.....	.....	7	175 00
Fy-products manufacturing	2	5 00	.....	.....	.....	.....	.....	.....	2	10 00
Private hatchery product dealer	4	4 00	.....	.....	.....	.....	.....	.....	4	16 00
Hotel serving private hatchery product	1	1 00	.....	.....	.....	.....	.....	.....	1	4 00
TOTALS.....	886	\$1,863 00	407	\$664 50	80	\$824 00	53	\$152 00	1,405	\$3,133 50
CANNERY LICENSES—										
Salmon	14	\$350 00	9	\$225 00	5	\$125 00	4	\$100 00	32	\$900 00
Shell fish	5	75 00	.....	.....	10	150 00	8	120 00	23	345 00
TOTALS.....	19	\$425 00	9	\$225 00	15	\$275 00	12	\$220 00	55	\$1,145 00
MISCELLANEOUS RECEIPTS—										
1925 licenses	13	\$75 00	7	\$15 00	54	\$60 50	6	\$17 75	80	\$171 25
RECAPITULATION—										
Fishing licenses	2,178	\$21,800 00	1,647	\$14,888 00	1,065	\$3,201 00	1,236	\$3,868 15	6,726	\$43,847 24
Dealer's miscellaneous licenses	886	1,893 00	407	864 50	89	294 00	58	152 00	1,495	3,133 50
Cannery licenses	19	425 00	9	225 00	15	275 00	12	220 00	55	1,145 00
1925 licenses	13	75 00	7	15 00	64	60 50	6	17 75	80	171 25
GRAND TOTALS.....	3,066	\$24,193 00	2,180	\$15,992 50	1,823	\$3,850 50	1,307	\$4,257 90	8,356	\$48,206 90

YEARLY COMPARATIVE TABLE OF LICENSES ISSUED.

	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
PUGET SOUND DISTRICT																						
FISHING LICENSES—																						
Round net, double head.....	1	277	219	231	238	309	385	511	270	267	4	275	280	250	259	243	222	103	122	214	222	215
Round net.....	298	618	785	680	660	813	529	807	508	569	541	658	646	686	439	318	37	14	10	17	11	10
Set net.....	348	310	320	302	403	439	377	327	344	512	449	537	417	549	344	346	119	130	181	391	361	361
Gill net.....	69	123	176	283	242	337	307	243	258	354	187	180	218	155	187	144	116	108	111	100	144	130
Drag seine.....	91	79	64	69	95	127	137	169	252	288	362	275	449	204	258	172	252	123	153	93	154	136
Purse seine.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reef net.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Set line.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hook and line.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dip bag net.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Smeel drug bag net.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Smeel and berring.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brush weir.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Beam trawl.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clams and mussels.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clams for bait.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crabs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	1,341	1,407	1,544	1,782	1,621	1,741	2,016	1,653	2,035	1,914	2,337	2,023	3,305	3,043	3,416	2,315	2,993	1,140	1,185	1,428	1,870	2,178
DEALERS AND MISC. LICENSES—																						
Buyer's.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sewer buyer's.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Retail dealer.....	67	161	224	240	238	253	293	290	203	351	426	346	300	680	721	583	440	436	455	479	524	682
Wholesale dealer.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Broker.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Freezer.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hallbut wholesale dealer or broker.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Codfish, canning and curing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
By-product manufacturing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Private hatchery.....	1	6	3	4	2	2	2	1	3	5	5	2	2	2	3	5	6	6	7	7	9	2
Private hatchery product dealer.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hotel serving private hatch. prod.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Permit to collect birds.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	68	166	227	297	249	262	269	269	310	368	530	437	684	907	974	778	663	584	622	635	772	866
MISCELLANEOUS RECEIPTS.....																						
.....
CANNERY LICENSES.....																						
.....	24	13	14	10	23	14	22	22	32	22	45	38	52	41	43	23	23	19	24	17	30	19

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YEARLY COMPARATIVE TABLE OF LICENSES ISSUED—Continued.

	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
PUGET SOUND DIST.—Continued																						
RECAPITULATION—																						
Fishing licenses	1,341	1,407	1,541	1,732	1,691	1,741	2,016	1,853	2,085	1,914	2,337	2,093	3,305	3,043	3,416	2,315	2,093	1,146	1,185	1,429	1,876	2,178
Dealers and miscellaneous licenses	68	166	227	267	249	262	289	289	310	368	539	437	634	907	974	779	663	584	622	635	772	896
Miscellaneous receipts													1	9	56	7	26	96	34	26	32	13
Totals	1,409	1,573	1,771	2,049	1,970	2,008	2,285	2,222	2,345	2,282	2,876	2,530	3,940	3,959	4,445	3,100	2,782	1,826	1,841	2,069	2,680	3,077
Cannery licenses	24	13	14	10	23	14	22	22	32	22	45	38	52	41	43	23	28	19	24	17	30	19
Grand Totals	1,433	1,586	1,785	2,059	1,993	2,022	2,307	2,244	2,377	2,304	2,921	2,568	3,992	4,000	4,488	3,123	2,810	1,845	1,865	2,106	2,710	3,096
COLUMBIA RIVER DISTRICT																						
FISHING LICENSES—																						
First class pound net	23	25	22	19	21	18	20	21	17	14	20	33	74	131	132	126	92	78	93	112	140	132
Second class pound net	351	365	372	307	274	232	244	247	230	242	229	223	206	139	145	144	132	159	172	173	158	252
Stationary fish wheel	9	10	12	15	14	14	16	15	16	17	13	17	17	17	17	18	16	13	15	16	16	17
Scow fish wheel	4	7	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Set net	79	120	102	123	142	214	230	267	221	272	218	104	200	199	251	200	150	103	206	218	259	261
Gill net	443	646	620	816	743	563	677	758	566	441	676	633	601	627	517	488	523	471	460	539	535	530
Drag seine	60	53	47	53	30	30	27	23	25	45	30	38	46	46	46	45	40	37	42	37	41	45
Purse seine		1	8	9	2	3	1				6	19	24	30	43	64	56	3				
Set line											13	27					35	82	49	57	60	51
Hook and line											3	167	223	370	296	176	129	129	129	117	96	109
Bag net											3	210	252	180	118	125	96	78	80	108	116	80
Smeit and herring											82											
Smeit drag bag net																						
Beam trawl																						
Beam trawl bag net																						
Clams and mussels																						
Clams for bait																						
Crabs																						
Gill net boat puller																						
Totals	970	1,247	1,143	1,376	1,257	1,078	1,216	1,332	1,104	1,150	1,337	1,417	1,642	1,513	1,593	1,517	1,349	1,217	1,400	1,562	1,621	1,647

YEARLY COMPARATIVE TABLE OF LICENSES ISSUED—Continued.

	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
COLUMBIA RIVER DIST.—Continued																					
DEALERS AND MISC. LICENSES—																					
Buyer's	20	19	16	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scow buyer's .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Retail dealer	108	80	79	98	141	269	216	212	225	243	260	230	237	185	191	208	199	287	276	291	339
Wholesale dealer .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Broker .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Halibut wholesale dealer or broker .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Freezer .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
By-product manufacturing .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Private hatchery .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hotel serving private hatch. prod. .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Permit to collect birds .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	134	99	95	105	144	214	219	215	237	257	276	258	284	225	241	259	241	437	357	390	508
MISCELLANEOUS RECEIPTS .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
CANNERY LICENSES	9	8	7	6	6	6	6	6	6	8	12	7	9	10	9	9	9	11	11	10	9
RECAPITULATION—																					
Fishing licenses	9701	247	1,143	1,376	1,257	1,078	1,216	1,382	1,104	1,150	1,337	1,417	1,612	1,513	1,508	1,517	1,349	1,217	1,400	1,582	1,622
Dealers and miscellaneous licenses	134	99	95	105	144	214	219	215	237	257	276	258	284	225	241	259	241	437	357	390	508
Miscellaneous receipts .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	1,104	1,346	1,238	1,481	1,401	1,292	1,435	1,547	1,341	1,409	1,613	1,675	1,896	1,745	1,757	1,783	1,590	1,703	1,977	2,154	2,121
Cannery licenses	9	8	7	6	6	6	6	6	6	8	12	7	9	10	9	9	11	11	10	9	9
Grand Totals	1,113	1,354	1,245	1,487	1,407	1,298	1,441	1,553	1,347	1,417	1,625	1,682	1,899	1,755	1,846	1,792	1,599	1,804	1,987	2,172	2,130

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YEARLY COMPARATIVE TABLE OF LICENSES ISSUED—Continued.

	1906	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	
GRAYS HARBOR DISTRICT																							
FISHING LICENSES—																							
Round net	16	20	21	17	18	21	32	42	38	32	31	36	53	52	48	49	47	47	56	57	50	66	
Set net	75	114	100	100	60	110	240	302	253	249	183	134	276	316	349	290	242	183	196	160	125	88	
Ull net	6	63	54	36	1	79	111	72	63	117	80	113	168	94	117	45	60	62	38	44	51	49	
Trag seine						4		7	13	12			3	2	1	2						1	
Kuse seine											1				1							3	
Set line																29	36	6	1	6	1	4	
Hook and line																						3	
Snelt drag bag net											618	347	284	304	476	418	608	1,222	1,022	823	1,063	1,449	
Clams and mussels																4	1	4	4		3	2	
Clams for bait											38	8	13	10	5	15	11	14	13	6	5	3	
Crabs																							
Totals	150	197	175	153	98	210	387	423	*372	410	908	645	749	803	1,068	861	1,007	1,538	1,290	1,077	1,341	1,665	
DEALERS AND MISC. LICENSES—																							
Buyer's																							
Scow buyers			2	1	3	2	3	7	4			2	1	2	4	5	3	1		3	18	29	
Reel dealer			6	5	7	14	16	12	37	30	23	38	31	42	46	50	41	59	51	46	44	45	
Wholesale dealer	1	7									8	11	11	9	14	14	11	12	13	14	17	12	
Freight																					2	2	
Haibut wholesale dealer or broker																						1	
Totals	1	7	9	6	10	16	19	15	44	43	36	51	44	53	66	60	55	76	65	65	81	89	
MISCELLANEOUS RECEIPTS																							
CANNERY LICENSES	2	2	1	1	1	3	5	6	8	7	8	19	21	21	20	14	21	27	27	25	21	15	
RECAPITULATION—																							
Fishing licenses	150	197	175	153	98	210	387	422	372	410	908	645	740	803	1,068	861	1,007	1,538	1,290	1,007	1,341	1,665	
Dealers and miscellaneous licenses	1	7	9	6	10	16	19	15	44	43	36	51	44	53	66	60	55	76	65	65	81	89	
Miscellaneous receipts																							
Totals	160	204	184	159	108	226	406	438	416	453	944	696	803	800	1,217	963	1,152	1,738	1,420	1,226	1,321	1,808	
Cannery licenses	2	2	1	1	1	3	5	6	8	7	8	19	21	21	20	14	21	27	27	25	21	15	
Grand Totals	162	206	185	160	109	229	411	444	424	460	952	715	821	881	1,237	977	1,173	1,765	1,447	1,251	1,542	1,823	

* One scow fish wheel license.

YEARLY COMPARATIVE TABLE OF LICENSES ISSUED—Continued.

	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
WILLAPA HARBOR DISTRICT																						
FISHING LICENSES—																						
Pound net	50	74	45	51	42	40	51	67	33	44	50	53	48	62	68	64	56	32	4	34	47	142
Set net	36	52	53	64	65	152	283	291	109	171	81	101	222	184	174	96	61	12	24	100	141	85
Gill net	5	2	17	16	15	14	80	65	29	52	46	54	84	58	76	32	43	27	19	47	71	53
Drag seine		3	1	3	7	3	4					1			2				1	1	1	
Purse seine																88	78	1				
Hook and line													3	9	16	16	6	5	2	2	1	6
Bag net												3	2	3	1	1						
Clams and mussels											164	134	85	62	164	206	285	343	294	295	511	843
Clams for bait											160	120	43	18	22	10	11	19	24	52	62	54
Crabs											160	120	96	56	52	55	65	51	40	51	35	54
Set lines																					2	1
Totals	91	131	116	134	129	209	424	423	171	267	501	475	583	449	551	579	603	487	385	549	833	1,238
DEALERS AND MISC. LICENSES—																						
Buyer's																2	2	1		8	14	21
Retail dealer			1	2	4	17	13	7	6	14	18	13	11	16	23	23	23	17	16	21	13	21
Wholesale dealer											19	14	10	10	17	15	15	8	6	11	8	10
Broker																					1	1
Freezer																					1	1
Permit to collect birds																					12	14
Totals			1	2	4	17	13	7	6	14	37	27	30	31	48	40	40	38	22	42	50	53
MISCELLANEOUS RECEIPTS.																						
													4	4	10	4	5	4	4	2	34	6
CANNERY LICENSES.																						
	2	2	2	2	1	1	2	8	2	2	2	5	5	5	9	6	5	8	11	11	11	12
RECAPITULATION—																						
Fishing licenses	91	131	116	134	129	209	424	423	171	267	501	475	583	449	561	579	603	487	385	549	833	1,238
Dealers and miscellaneous licenses			1	2	4	17	13	7	6	14	37	27	30	31	48	40	40	38	22	42	50	53
Miscellaneous receipts																4	5	4	4	2	34	6
Totals	91	131	117	136	133	226	437	430	177	291	538	502	617	484	619	623	648	529	391	588	917	1,295
Cannery licenses																						
	2	2	2	2	1	1	2	3	2	2	2	5	5	5	9	6	5	8	11	11	11	12
Grand Totals	93	133	119	138	134	227	439	433	179	293	540	507	622	490	628	639	653	537	402	604	928	1,307

YEARLY COMPARATIVE TABLE OF LICENSES ISSUED—Continued.

	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
ALL DISTRICTS COMBINED																						
FISHING LICENSES—																						
Pound net.....	669	761	630	625	587	600	647	712	629	692	610	620	664	636	647	626	550	610	517	501	636	607
Fish wheel.....	13	17	22	19	20	18	17	22	26	26	27	27	28	25	27	27	25	23	23	23	28	28
Set net.....	764	904	1,010	1,129	962	1,142	1,572	1,682	1,802	1,150	964	977	1,356	1,345	1,440	1,024	771	845	390	478	542	445
Gill net.....	865	1,011	1,020	1,200	1,130	1,069	1,267	1,272	1,077	1,114	1,314	1,240	1,327	1,006	1,250	1,020	972	670	673	811	1,048	963
Drug seine.....	129	175	224	230	250	290	342	273	276	111	210	228	267	253	255	184	152	150	149	149	151	149
Purse seine.....	91	80	72	78	97	130	138	169	252	288	308	294	444	224	301	345	386	127	133	128	154	173
Reef net.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Set line.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hook and line.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bag net.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Snait drag bag net.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Snait and herring.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brush weir.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Beam trawl.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clams and mussels.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clams for bait.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crabs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gill net boat puller.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	2,561	2,982	2,973	3,445	3,106	3,238	4,043	4,131	3,082	3,741	5,083	4,630	6,279	5,808	6,638	5,292	5,062	4,388	4,240	4,056	5,672	6,720
DEALERS AND MISC. LICENSES—																						
Buyer's.....	26	19	19	8	6	7	6	6	10	15	32	27	178	118	124	72	103	81	97	87	235	215
Retail dealer.....	176	248	310	354	383	493	508	491	561	647	722	627	620	923	853	894	703	704	778	827	930	1,082
Wholesale dealer.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	166	103	126	110	106	100	108	111	124	118
Broker.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pewee.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Halibut wholesale dealer or broker.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Codfish, canning and curing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
By product manufacturing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Private hatchery.....	1	5	3	4	4	2	2	1	3	5	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Private hatchery product dealer.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hotel serving private hatch, prod.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Permit to collect birds.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	208	272	332	380	407	500	520	506	597	682	888	773	962	1,216	1,329	1,146	990	1,185	1,006	1,132	1,411	1,406

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YEARLY COMPARATIVE TABLE OF LICENSES ISSUED—Concluded.

	1906	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926		
ALL DISTRICTS COMBINED— Continued																								
*MISCELLANEOUS RECEIPTS	37	25	24	19	31	24	36	37	48	39	67	69	57	77	81	52	63	66	73	69	71	80	55	
RECAPITULATION—																								
Fishing licenses	2,561	2,962	2,978	3,445	3,103	3,238	4,043	4,131	3,682	3,741	5,083	4,630	6,273	5,808	6,638	5,262	5,062	4,898	4,240	4,656	5,672	6,726		
Dealers and miscellaneous licenses	208	272	332	380	407	509	520	506	597	682	888	773	992	1,216	1,329	1,146	999	1,185	1,068	1,132	1,411	1,486		
Miscellaneous receipts										2			19	24	151	61	121	313	104	97	199	80		
Totals	2,764	3,254	3,310	3,825	3,512	3,747	4,563	4,637	4,279	4,425	5,971	5,403	7,290	7,048	8,118	6,469	6,172	5,986	5,410	5,886	7,282	8,301		
Cannery licenses	37	25	24	19	31	24	35	37	48	39	67	69	57	77	81	52	63	66	73	69	71	80	55	
Grand Totals	2,801	3,279	3,334	3,944	3,543	3,771	4,598	4,674	4,327	4,464	6,038	5,472	7,347	7,125	8,199	6,521	6,235	5,951	5,483	5,948	7,353	8,356		

*This item represents receipts which were issued in lieu of licenses, upon payment of license fees, to persons who had operated the previous year without securing licenses as required by law.

CATCH OF SALMON AND VALUE.
Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Number of Chinook Salmon	Number of Dog Salmon	Number of Humpback Salmon	Number of Silver Salmon	Number of Sockeye Salmon	Number of Steelhead Salmon	Totals
PUGET SOUND DISTRICT—							
Pound nets	262,396	125,164	21,673	384,000	331,374	6,379	1,071,505
Set nets	42	42	.....	461	.....	.....	505
Gill nets	49,801	98,734	550	37,436	3,433	.....	203,420
Drag seines	1,058	1,044	.....	2,838	6,694	6	12,619
Purse seines	5,469	888,371	1,764	202,721	90,523	.....	1,169,653
Reef nets	77	241	.....	2,957	735	.....	4,016
Hook and lines	2,368	85	117	22,293	65	176	25,089
Smelt drag bag nets.....	.....	14	.....	8	.....	.....	22
Totals.....	253,129	1,063,695	24,489	705,292	431,767	10,199	2,489,371
Value.....	\$917,461 51	\$425,478 00	\$48,488 22	\$435,793 21	\$86,563 23	\$11,014 92	\$2,135,650 09
COLUMBIA RIVER DISTRICT—							
First class pound nets.....	111,046	15,462	.....	78,968	17,667	79,100	301,603
Second class pound nets.....	41,988	10,881	.....	41,778	5,291	35,821	135,769
Stationary fish wheels.....	951	.....	.....	.....	1,504	650	3,195
Snow fish wheels.....	1,061	.....	.....	58	1,063	1,465	3,607
Set nets	3,803	785	.....	836	16,162	22,482	44,068
Gill nets	145,622	35,668	.....	23,351	50,014	36,628	290,483
Drag seines	38,676	671	.....	1,683	14,282	36,168	91,480
Set lines	10	.....	.....	.....	3	.....	13
*Totals.....	343,657	62,797	.....	146,704	105,436	212,304	870,298
Value.....	\$820,562 34	\$5,651 73	.....	\$88,169 10	\$72,750 84	\$148,612 80	\$1,135,776 81
GRAYS HARBOR DISTRICT—							
Pound nets	5,800	18,158	.....	41,372	.....	241	65,601
Set nets	968	4,646	.....	4,642	30	219	10,686
Gill nets	7,019	12,447	.....	19,384	629	629	39,479
Smelt drag bag nets.....	11	216	.....	255	.....	40	523
Totals.....	13,825	35,817	.....	65,554	30	1,120	116,349
Value.....	\$15,962 20	\$5,372 55	.....	\$82,777 00	\$23 94	\$2,016 00	\$66,091 60

*These Columbia River totals of different varieties of salmon secured by using average weights on the total tonnage reported in the district, as all fish in Columbia River is purchased on a tonnage basis.

CATCH OF SALMON AND VALUE—Concluded.
Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Number of Chinook Salmon	Number of Dog Salmon	Number of Humback Salmon	Number of Silver Salmon	Number of Sockeye Salmon	Number of Steelhead Salmon	Totals
WILLAPA HARBOR DISTRICT—							
Pound nets	12,301	80,870		23,563			117,904
Set nets	1,189	10,476		2,605			14,434
Gill nets	6,317	7,626		4,698			18,499
Hook and lines	4						4
Totals	19,791	99,222		30,625		593	150,211
Value	\$22,739 65	\$14,884 80		\$15,312 50		\$1,067 40	\$54,024 35
ALL DISTRICTS COMBINED—							
Pound nets	373,591	250,435	21,673	570,610	383,722	121,852	1,681,883
Stationary fish wheels	1,061				1,594	660	3,195
Set fish wheels	5,940			38	1,063	1,455	3,607
Gill nets	199,689	16,369	860	8,566	16,132	22,846	69,723
Drag seines	40,654	154,165		104,293	32,390	40,818	551,881
Purse seines	5,462	1,715	1,764	4,321	50,976	36,174	104,369
Hook and lines	77	838,371	6	332,721	90,623	205	1,169,663
Set drag bag nets	2,372	231	117	2,367	735		4,016
Set lines	11	83		22,290	65	176	25,064
	10	230		204		40	545
						3	13
Totals	629,895	1,201,541	24,489	946,175	587,233	224,216	3,623,459
Value	\$1,626,735 70	\$451,387 08	\$48,488 22	\$501,691 81	\$459,688 01	\$102,711 12	\$3,380,951 94

Note—These totals do not include any of the fish brought in and sold by outside trolliers.

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
PUGET SOUND DISTRICT—							
1913							
Pound nets.....	212,507	159,473	11,353,709	731,329	11,549,669	17,137	24,023,824
Gill nets.....							
Set nets.....	77,537	445,384	4,554,001	493,736	10,049,295	26,148	15,646,151
Drag seines.....							
Purse seines.....							
Totals.....	230,044	604,857	15,907,710	1,225,115	21,598,964	43,285	39,669,975
1914							
Pound nets.....	224,397	254,154	25,888	479,155	2,107,399	25,833	3,116,825
Gill nets.....							
Set nets.....	201,562	1,431,983	49,603	1,020,151	1,344,004	38,785	4,066,108
Drag seines.....							
Purse seines.....							
Totals.....	425,979	1,686,137	75,491	1,499,306	3,451,402	64,618	7,202,933
1915							
Pound nets.....	244,011	180,180	2,907,463	525,356	593,729	17,510	4,458,249
Gill nets.....	24,334	93,151	35,983	127,327	18,913	4,909	304,577
Set nets.....	6,969	21,496	38,030	63,794	2,476	5,885	138,639
Drag seines.....	2,910	20,541	2,271	6,099	58	58	31,937
Purse seines.....	22,634	1,566,995	4,361,203	392,750	197,569	10,130	6,541,131
Hook and lines.....	18						18
Reef nets.....	192	827	23,238	3,070	1,640		28,967
Drag bag nets.....	124	1,055	525	510			2,214
Totals.....	301,192	1,884,144	7,368,713	1,108,896	804,385	38,452	11,505,782
1916							
Pound nets.....	244,011	180,181	9,294	525,356	593,729	17,511	1,560,082
Gill nets.....	24,334	93,151	1,591	127,327	18,913	4,870	270,186
Set nets.....	6,970	21,496	478	63,795	2,476	5,886	101,091
Drag seines.....	2,911	20,541	33	6,099	58	58	29,700
Purse seines.....	22,636	1,566,995	56,702	392,750	197,570	10,130	2,236,682
Reef nets.....	192	828		3,071	1,641		5,732
Drag bag nets.....	125	1,055		510			1,690
Totals.....	301,178	1,884,147	68,098	1,108,896	804,387	38,455	4,205,163
1917							
Pound nets.....	235,484	131,804	4,429,436	485,631	2,849,345	12,573	8,191,273
Gill nets.....	77,561	84,818	134,470	96,092	113,699	3,133	509,753
Set nets.....	13,622	16,098	9,417	44,478	286	10,191	94,060
Drag seines.....	4,181	27,973	4,536	12,659	938	10	50,297
Purse seines.....	38,155	832,922	8,711,055	232,703	1,980,191	2,184	11,806,210
Hook and lines.....	21,792	580	1,398	58,080	946	42	82,828
Reef nets.....	49	820	57,973	6,611	7,556		73,016
Totals.....	440,864	1,095,015	13,345,280	936,242	4,961,933	29,138	20,807,497
1918							
Pound nets.....	331,459	173,782	60,181	703,173	495,910	11,956	1,826,463
Set nets.....	15,121	26,446	554	97,798	154	9,316	148,387
Gill nets.....	39,946	93,638	1,518	173,810	17,652	2,453	333,017
Drag seines.....	964	59,788	23	24,681	77		85,533
Purse seines.....	14,731	799,883	3,097	513,973	45,073	11,915	1,399,672
Reef nets.....	1,515	914	12,449	12,634	2,096		29,547
Hook and lines.....	24,457	120	28	109,408	529	8	131,548
Drag bag nets.....	3	2,050		52			2,105
Totals.....	477,246	1,156,571	77,849	1,637,525	561,431	34,650	3,945,272

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YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
PUGET SOUND							
DISTRICT—Continued							
1919							
Pound nets.....	257,638	195,292	2,061,944	711,429	453,965	11,818	3,702,086
Set nets.....	9,823	30,000	5,431	72,491	60	8,529	126,334
Gill nets.....	47,022	62,938	37,584	129,896	4,803	2,275	284,517
Drag seines.....	726	80,835	.....	12,113	.....	.....	95,674
Purse seines.....	12,250	1,112,404	2,513,521	427,566	233,660	1,868	4,351,289
Reef nets.....	962	3,404	29,042	9,639	3,210	50	46,307
Hook and lines.....	19,345	47	298	.....	996	158	20,944
Bag nets.....	.....	171	.....	.....	.....	.....	171
Totals.....	347,760	1,475,091	4,667,820	1,363,153	746,694	24,698	8,625,222
1920							
Pound nets.....	217,245	111,433	13,753	247,651	595,304	9,837	1,105,223
Set nets.....	7,953	5,658	33	39,634	464	5,475	59,217
Gill nets.....	22,482	19,534	157	70,920	3,241	2,565	118,899
Drag seines.....	123	5,073	.....	2,370	.....	2	7,568
Purse seines.....	17,715	541,213	4,943	158,467	53,053	14	775,435
Reef nets.....	60	143	13	2,361	813	.....	2,890
Hook and lines.....	6,348	16	667	48,102	208	226	55,567
Totals.....	271,926	693,070	19,566	569,505	652,613	18,119	2,214,799
1921							
Pound nets.....	224,099	32,414	1,967,899	293,409	859,596	5,066	3,382,503
Set nets.....	4,833	3,252	.....	.....	.....	.....	8,085
Gill nets.....	26,910	20,323	87,271	101,969	48,404	56	284,953
Drag seines.....	415	471	17,131	1,556	3,196	.....	22,768
Purse seines.....	9,053	211,196	2,303,008	334,604	221,152	769	3,079,784
Reef nets.....	56	334	19,269	3,749	2,626	.....	26,034
Hook and lines.....	3,616	2,201	429	26,662	.....	3	32,911
Bag nets.....	.....	.....	6,509	252	500	.....	7,261
Totals.....	268,982	270,193	4,401,516	762,221	1,136,473	5,914	6,844,299
1922							
Pound nets.....	186,945	89,427	26,353	463,397	399,431	5,938	1,171,491
Set nets.....	326	72	.....	1,177	.....	.....	1,575
Gill nets.....	11,412	6,572	291	29,591	9,394	.....	57,260
Drag seines.....	3,796	4	577	613	7,757	121	12,868
Purse seines.....	5,184	405,905	5,057	370,810	83,277	606	875,839
Reef nets.....	8	250	11	3,164	682	.....	4,115
Set lines.....	.....	.....	.....	382	.....	.....	382
Hook and lines.....	688	.....	.....	23,226	10	31	23,955
Totals.....	208,359	502,230	32,239	892,380	506,551	6,696	2,147,485
1923							
Pound nets.....	195,288	74,465	2,443,230	441,881	331,914	7,387	3,494,165
Set nets.....	19	97	.....	1,073	.....	.....	1,170
Gill nets.....	22,648	24,574	22,487	54,948	5,541	190	130,398
Drag seines.....	1,617	9,195	7,392	7,078	627	18	25,927
Purse seines.....	4,743	528,542	3,021,782	344,866	142,355	96	4,042,384
Reef nets.....	3	993	39,371	3,241	1,950	.....	44,558
Hook and lines.....	325	16	824	34,334	.....	.....	35,499
Bag nets.....	.....	.....	.....	50	.....	.....	50
Totals.....	224,624	637,882	5,534,066	887,471	482,387	7,691	7,774,141
1924							
Pound nets.....	211,536	84,200	84,698	497,414	633,478	8,963	1,520,289
Set nets.....	19	15	.....	152	.....	.....	186
Gill nets.....	26,892	60,733	1,922	93,560	7,593	9	190,709
Drag seines.....	1,676	890	551	12,945	3,459	51	19,542
Purse seines.....	2,515	713,258	12,649	299,500	99,098	2,317	1,129,337
Reef nets.....	42	917	225	4,755	3,211	.....	9,150
Hook and lines.....	2,921	.....	1	38,394	.....	12	41,328
Totals.....	245,601	859,983	100,046	946,720	746,839	11,352	2,910,541

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
PUGET SOUND DISTRICT—Continued							
1925							
Pound nets.....	235,138	67,204	1,964,771	432,115	923,966	6,152	3,624,346
Set nets.....		242	4	2,404			2,710
Gill nets.....	34,810	29,246	37,443	85,513	10,885	2,065	199,962
Drag seines.....	4,165	968	23,605	3,790	11,931	20	44,479
Purse seines.....	9,238	436,408	4,602,188	321,352	287,329	101	5,656,616
Reef nets.....	19	744	47,236	2,802	2,747		53,548
Hook and lines.....	1,126		98	20,977	902	236	23,369
Totals.....	284,496	534,912	6,665,345	869,013	1,242,820	8,564	9,605,080
1926							
Pound nets.....	202,366	125,164	21,673	384,600	331,374	6,379	1,071,556
Set nets.....		42		463			505
Gill nets.....	40,891	98,734	550	57,436	2,376	3,433	203,420
Drag seines.....	1,958	1,044	379	2,838	6,694	6	12,919
Purse seines.....	5,469	838,371	1,764	232,721	90,523	205	1,169,063
Reef nets.....	77	241	6	2,957	735		4,016
Hook and lines.....	2,368	85	117	22,269	65	176	25,080
Smelt drag bag nets.....		14		8			22
Totals.....	253,129	1,063,605	24,489	703,292	431,767	10,199	2,486,571
COLUMBIA RIVER DISTRICT—							
1913							
Pound nets.....	99,660	25,667	5,621	169,280	56,288	38,972	395,488
Fish wheels.....							
Gill nets.....							
Set nets.....	362,670	42,065		100,360	38,856	93,014	636,965
Drag seines.....							
Totals.....	462,330	67,732	5,621	269,640	95,144	131,986	1,032,453
1914							
Pound nets.....	142,378	29,359	2,509	178,306	140,893	79,028	572,473
Fish wheels.....							
Gill nets.....							
Set nets.....	453,911	180,320	4,731	185,847	199,553	60,982	1,065,244
Drag seines.....							
Totals.....	596,189	209,679	7,240	364,153	340,446	140,010	1,657,717
1915							
Pound nets.....	174,921	35,016	4,710	89,898	11,701	60,889	377,135
Stationary fish wheels.....	8,441			59	25,980	5,380	39,860
Scow fish wheels.....	5,199				6,546	641	12,386
Gill nets.....	129,162	19,775	1,249	10,251	4,347	21,570	186,354
Set nets.....	2,659	1,006	433	919	1,153	4,199	10,374
Drag seines.....	32,800	326	37	4,200	7,646	16,547	61,646
Purse seines.....	14,065	3,593	35,350	8,252	462	9,421	71,173
Totals.....	367,367	59,716	41,779	113,579	57,840	118,647	758,923
1916							
Pound nets.....	174,921	35,016	2,040	89,898	11,702	60,889	374,466
Stationary fish wheels.....	8,442			60	25,979	5,380	39,861
Scow fish wheels.....	5,199				6,547	641	12,387
Gill nets.....	129,163	19,776	2,261	10,252	4,347	21,571	187,370
Set nets.....	2,660	1,005	121	918	1,157	4,199	10,080
Drag seines.....	32,801	327		4,200	7,647	16,548	61,613
Purse seines.....	14,065	3,593		8,253	462	9,422	35,825
Totals.....	367,371	59,717	4,422	113,581	57,841	118,650	721,562

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YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
COLUMBIA RIVER DISTRICT—Continued							
1917							
First class pound net....	71,798	7,321	61	33,068	3,373	23,964	139,490
Second class pound net....	59,412	19,148	37	46,927	2,237	17,623	144,384
Stationary fish wheels....	11,668				34,524	8,565	54,757
Scow fish wheels....	7,609				10,369	890	18,868
Gill nets.....	461,810	37,260	1,029	24,112	11,442	69,667	606,320
Set nets.....	7,015	4,468	465	569	3,996	7,379	23,792
Drag seines.....	24,009	1,563		19,565	2,311	14,890	62,368
Purse seines.....	11,583	246	34,634	3,608	9,484	677	60,232
Hook and lines.....	26,479	29		14,851	750	133	42,242
Bag nets.....	79						79
Totals.....	680,462	70,065	36,226	142,700	73,981	143,688	1,151,522
1918							
First class pound net....	80,228	8,491	172	74,146	11,382	40,947	215,766
Second class pound net....	15,639	3,196		22,067	6,189	13,155	60,266
Stationary fish wheels....	6,690				59,552	5,006	71,247
Scow fish wheels....	2,965			11	42,231	1,671	46,878
Set nets.....	4,632	1,628	6,518	1,990	21,195	7,782	43,695
Gill nets.....	217,422	32,792	3,080	51,793	106,823	49,603	461,508
Drag seines.....	21,384	700	227	6,963	13,569	19,221	62,684
Purse seines.....	43,278		385	24,318	187	3,480	71,648
Hook and lines.....	56,369	20		62,726	1,149	199	122,463
Drag bag nets.....	126			26		101	253
Totals.....	450,733	46,827	10,392	243,970	262,777	141,664	1,156,408
1919							
First class pound net....	64,785	23,636	17	50,850	5,027	31,144	176,059
Second class pound net....	23,499	8,922		15,770	2,043	11,869	62,093
Stationary fish wheels....	7,374				11,010	2,196	20,580
Scow fish wheels....	6,618				7,196	717	14,531
Set nets.....	3,628	3,253	10	465	3,307	3,491	14,154
Gill nets.....	162,586	72,711	741	22,385	11,421	26,324	296,668
Drag seines.....	24,439	57	32	13,128	9,404	14,037	61,097
Purse seines.....	76,819			16,290	333	1,161	94,603
Hook and lines.....	54,918		500	80,365	876	254	136,913
Totals.....	424,666	108,579	1,300	199,253	51,217	91,683	876,698
1920							
First class pound net....	54,981	28,029		23,197	984	16,383	123,574
Second class pound net....	17,051	5,940		8,508	967	6,939	39,406
Stationary fish wheels....	6,018				13,252	5,419	24,689
Scow fish wheels....	5,175				5,167	1,463	11,806
Set nets.....	3,141	496		339	1,286	3,027	8,338
Gill nets.....	154,544	5,233		6,892	2,153	16,237	185,029
Drag seines.....	18,296	1,750		4,772	2,559	10,493	37,870
Purse seines.....	39,633	1,127		4,045	26	1,725	46,556
Hook and lines.....	51,554	217		36,524	32	185	88,512
Totals.....	350,393	42,791		84,297	26,426	61,871	566,778
1921							
First class pound net....	36,910	1,200	21	32,732	1,316	21,409	93,588
Second class pound net....	11,850	500	1	15,789	1,753	11,467	41,360
Stationary fish wheels....	7,206				17,061	2,648	26,915
Scow fish wheels....	3,016				7,227	665	10,908
Set nets.....	1,837	88	4	1,247	1,646	2,632	7,504
Gill nets.....	102,142	296	2,922	6,618	6,440	18,573	136,991
Drag seines.....	7,997	5	300	2,736	112	5,949	16,999
Purse seines.....	15,653		835	178	790	332	17,788
Hook and lines.....	13,508	6		59,343	8	175	73,035
Totals.....	200,014	2,095	4,063	118,643	36,353	63,900	425,088

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YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
COLUMBIA RIVER DISTRICT—Continued							
1922							
First class pound net....	31,486	5,300		34,811	9,631	21,192	102,420
Second class pound net....	21,663	11,073		50,394	15,900	23,647	122,677
Stationary fish wheels....	4,635				31,938	2,016	37,969
Scow fish wheels....	4,784			700	11,228	666	17,378
Set nets....	1,750	256	26	1,543	7,879	4,953	16,407
Gill nets....	71,621	3,639		14,062	48,209	16,974	154,495
Drag seines....	8,377	404		6,119	9,704	12,122	36,726
Hook and lines....	4,909			54,024	129	123	59,185
Dip bag nets....	62				111	4	177
Totals.....	148,687	20,672	26	161,643	134,729	81,697	547,454
1923							
First class pound net....	44,529	32,847		106,198	16,739	51,041	251,354
Second class pound net....	17,674	17,772		67,407	14,934	34,741	152,528
Stationary fish wheels....	5,536				25,345	6,068	36,949
Scow fish wheels....	3,691				19,763	5,117	28,571
Set nets....	1,556	1,137		745	6,241	4,516	14,197
Gill nets....	123,396	25,761		15,580	112,000	47,482	324,219
Drag seines....	71,347	263		10,376	9,329	17,834	106,149
Hook and lines....	6,957			21,222		57	28,306
Set lines....	20	83		3			106
Totals.....	274,706	77,863		221,601	204,351	166,858	945,379
1924							
First class pound net....	72,837	37,795		126,908	8,513	54,890	300,943
Second class pound net....	37,956	15,116		50,259	8,174	30,006	141,511
Stationary fish wheels....	3,905	220		858	3,249	535	8,467
Scow fish wheels....	3,393	220		858	2,433	144	7,048
Set nets....	2,277	521		510	1,348	2,265	6,921
Gill nets....	168,310	121,641		48,136	8,820	43,885	390,792
Drag seines....	21,638	596		3,694	4,753	15,197	45,878
Hook and lines....	1,799	10		2,512	3	60	4,384
Dip bag nets....	175					249	424
Set lines....	3			1		2	6
Totals.....	311,993	176,119		233,736	37,293	147,233	906,374
1925							
First class pound net....	101,380	49,167		76,497	2,850	49,479	278,362
Second class pound net....	23,384	12,236		19,867	1,270	11,541	68,348
Stationary fish wheels....	12,328			6,868	14,008	25,598	56,002
Scow fish wheels....	3,346				4,522	2,943	11,311
Set nets....	2,976	1,310		857	1,171	2,743	9,057
Gill nets....	222,926	59,294		26,226	5,229	46,966	386,541
Drag seines....	24,844	1,871		1,408	2,300	10,856	41,279
Hook and lines....	1,346			4,020		1	5,367
Dip bag nets....	82	38		18			138
Set lines....	19	27				8	54
Totals.....	393,340	123,993		135,761	31,350	149,085	833,479
1926							
First class pound net....	111,046	15,402		78,998	17,057	79,100	301,603
Second class pound net....	41,988	10,881		41,778	5,291	35,821	136,759
Stationary fish wheels....	951				1,594	650	3,195
Scow fish wheels....	1,061			58	1,093	1,455	3,667
Set nets....	3,893	785		836	16,102	22,482	44,098
Gill nets....	145,432	35,058		23,351	50,014	36,628	290,483
Drag seines....	38,676	671		1,633	14,282	36,168	91,480
Set lines....	10				3		13
Totals.....	343,057	62,797		146,704	106,436	212,304	870,296

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
GRAYS HARBOR DISTRICT—							
1913							
Pound nets.....	5,601	19,447		53,942		288	79,278
Gill nets.....	79,046	53,092	38,844	35,315	263,198	86,494	555,989
Set nets.....							
Drag seines.....							
Totals.....	82,647	72,539	38,844	89,257	263,198	86,782	635,267
1914							
Pound nets.....	17,878	24,972	347	48,824	639	8,859	101,518
Gill nets.....	16,865	107,752	85	151,615	80,814	18,131	375,262
Set nets.....							
Drag seines.....							
Totals.....	34,743	132,724	432	200,439	81,453	28,989	476,780
1915							
Pound nets.....	23,471	35,728		41,666	82	1,018	101,965
Gill nets.....	12,669	32,763	73	17,963	21	985	64,474
Set nets.....	7,072	15,963		14,777	28	,992	39,862
Drag seines.....	673	17		2,309			2,999
Totals.....	43,885	84,491	73	76,715	131	3,996	209,290
1916							
Pound nets.....	23,471	35,728	1,028	41,666	82	1,019	102,993
Gill nets.....	12,670	32,763	360	17,962	22	984	64,781
Set nets.....	7,071	15,962		14,776	28	1,992	39,849
Drag seines.....	672	17		2,309			2,998
Totals.....	43,884	84,490	1,388	76,713	132	3,994	210,601
1917							
Pound nets.....	16,636	15,702		35,186		2,227	69,751
Gill nets.....	18,384	8,428		14,071	120	422	41,925
Set nets.....	13,491	19,048	8	39,068	3	3,668	75,296
Hook and lines.....	449			1,899			2,348
Totals.....	49,460	43,178	8	90,224	123	6,317	189,310
1918							
Pound nets.....	2,307	2,865		9,212		7	14,391
Set nets.....	7,666	11,992	161	54,630	326	3,354	78,129
Gill nets.....	18,903	12,732		70,595	825	515	103,620
Hook and lines.....	510	111		5,895			6,316
Totals.....	29,386	27,750	161	140,132	1,151	3,876	202,456
1919							
Pound nets.....	8,666	65,809		23,295		1,088	98,948
Set nets.....	9,178	65,386	4,205	35,199	662	5,105	119,735
Gill nets.....	6,780	52,539		37,059		414	97,062
Drag seines.....	5						5
Hook and lines.....	2,317						2,317
Totals.....	26,946	184,124	4,205	95,553	662	6,607	318,097
1920							
Pound nets.....	13,034	13,897		35,526		1,067	63,514
Set nets.....	4,318	2,882	150	19,697	30	3,413	30,490
Gill nets.....	9,732	1,953		19,011	1,005	419	32,120
Hook and lines.....	667			119			786
Totals.....	27,751	19,722	150	74,353	1,035	4,809	126,910

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YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
GRAYS HARBOR DISTRICT—Continued							
1921							
Pound nets.....	12,967	5,069		\$2,377		136	50,579
Set nets.....	4,953	3,748	79	13,978	194	2,198	25,150
Gill nets.....	18,031	9,821	295	30,616	1,372	12	60,147
Hook and lines.....	1,774			2,764			4,538
Totals.....	37,725	18,668	374	79,735	1,566	2,346	140,414
1922							
Pound nets.....	15,026	29,451		48,274		282	93,933
Set nets.....	2,453	22,025		25,780	117	1,422	51,797
Gill nets.....	11,222	19,671		26,602		30	57,525
Hook and lines.....	598			1,480			2,078
Totals.....	30,199	71,147		102,136	117	1,734	206,333
1923							
Pound nets.....	13,400	75,730		99,380		200	188,710
Set nets.....	1,842	34,967		23,412		887	61,108
Gill nets.....	17,266	34,581		21,813		73	73,733
Totals.....	32,508	145,278		144,605		1,160	323,561
1924							
Pound nets.....	6,833	58,054		43,013		1	107,901
Set nets.....	1,502	24,327		15,552		837	42,218
Gill nets.....	6,492	33,186		29,457		203	69,338
Hook and lines.....	45			215			260
Smelt drag bag nets.....	16	241		202			459
Totals.....	14,888	115,806		88,439		1,041	220,176
1925							
Pound nets.....	6,193	71,258		37,808		1,012	116,271
Set nets.....	971	13,679		8,313		705	23,668
Gill nets.....	5,464	41,537		13,091		184	60,276
Hook and lines.....	11						11
Smelt drag bag nets.....	33	1,035		445			1,513
Totals.....	12,672	127,509		59,657		1,901	201,739
1926							
Pound nets.....	5,890	18,156		41,372		241	65,661
Set nets.....	906	4,906		4,542	30	210	10,686
Gill nets.....	7,019	12,447		19,384		629	39,479
Smelt drag bag nets.....	11	216		256		40	523
Totals.....	13,828	35,817		65,554	30	1,120	116,349
WILLAPA HARBOR DISTRICT—							
1913							
Pound nets.....	1,923	22,445		13,347			37,715
Gill nets.....	3,802	42,243		11,537		6,449	64,081
Set nets.....							
Totals.....	5,725	64,688		24,884		6,449	101,746
1914							
Pound nets.....	9,561	16,336	66	21,716	1,279	890	48,847
Gill nets.....	11,527	45,998		44,272		189	101,966
Set nets.....							
Totals.....	20,088	62,334	66	65,988	1,279	1,079	150,833

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
WILLAPA HARBOR DISTRICT—Continued							
1915							
Pound nets.....	16,381	49,440	531	27,102	.....	191	91,096
Gill nets.....	6,513	4,750	.....	4,930	.....	108	16,296
Set nets.....	4,912	14,998	.....	6,459	415	388	27,112
Totals.....	28,256	69,128	531	38,491	415	682	134,503
1916							
Pound nets.....	16,832	46,440	362	27,102	.....	191	90,927
Gill nets.....	6,512	4,750	.....	4,931	.....	102	16,296
Set nets.....	4,911	14,939	1,866	6,460	416	389	28,990
Totals.....	28,255	66,129	2,228	38,493	416	681	136,202
1917							
Pound nets.....	11,054	37,076	.....	24,569	.....	1,041	73,739
Gill nets.....	10,362	13,232	42	9,451	.....	171	32,248
Set nets.....	4,088	31,457	.....	8,968	85	825	45,423
Hook and lines.....	2	.....	.....	381	.....	.....	383
Totals.....	25,496	81,765	42	42,368	85	2,037	151,793
1918							
Pound nets.....	8,204	22,066	.....	42,234	.....	14	72,518
Set nets.....	1,315	16,361	.....	22,419	94	569	40,757
Gill nets.....	6,064	5,060	.....	17,027	3	43	28,217
Hook and lines.....	74	.....	.....	506	.....	.....	580
Totals.....	15,657	43,507	.....	82,186	97	626	142,072
1919							
Pound nets.....	6,694	96,939	.....	21,773	526	55	125,986
Set nets.....	3,455	39,311	20	9,046	.....	1,338	52,170
Gill nets.....	42,142	29,079	.....	12,900	.....	271	94,391
Drag seines.....	5	.....	.....	.....	.....	.....	5
Hook and lines.....	1	.....	.....	57	.....	.....	58
Totals.....	52,297	164,327	20	49,776	526	1,664	262,610
1920							
Pound nets.....	6,351	10,544	.....	5,979	.....	11	22,885
Set nets.....	1,586	335	.....	949	.....	621	3,491
Gill nets.....	2,431	163	.....	1,473	.....	114	4,231
Purse seines.....	110,138	.....	.....	5,165	3	3,799	119,105
Hook and lines.....	744	.....	.....	6	.....	.....	750
Totals.....	121,300	11,042	.....	13,572	3	4,545	150,462
1921							
Pound nets.....	8,969	8,379	.....	11,144	.....	17	29,006
Set nets.....	3,299	3,110	434	3,026	95	274	10,238
Gill nets.....	5,831	1,975	7	3,716	2	7	11,438
Purse seines.....	73,718	.....	6,298	1,397	868	2,502	94,643
Hook and lines.....	141	.....	.....	321	.....	.....	462
Totals.....	91,958	13,863	6,739	19,604	965	2,860	135,989
1922							
Pound nets.....	1,003	3,576	.....	3,130	.....	.....	7,709
Set nets.....	2	12	.....	62	.....	114	190
Gill nets.....	3,441	8,679	.....	1,859	.....	.....	13,979
Hook and lines.....	.....	.....	.....	138	.....	.....	138
Totals.....	4,446	12,267	.....	5,187	.....	114	22,014

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
WILLAPA HARBOR DISTRICT—Continued							
1923							
Set nets.....	211	33,387		1,823		249	35,670
Gill nets.....	2,622	19,382		796		22	22,822
Hook and lines.....	108			214			322
Totals.....	2,941	52,769		2,833		271	58,814
1924							
Pound nets.....	2,336	80,315		14,052		163	96,866
Set nets.....	1,048	27,211		8,197		1,161	37,617
Gill nets.....	5,091	17,593		15,545		418	38,589
Hook and lines.....	2			120			122
Totals.....	8,417	125,121		37,914		1,742	173,194
1925							
Pound nets.....	3,864	153,212		19,514		283	176,863
Set nets.....	1,162	34,629		4,136		454	40,381
Gill nets.....	6,625	35,427		7,156		123	49,331
Hook and lines.....							
Totals.....	11,641	223,268		30,806		800	266,575
1926							
Pound nets.....	12,301	80,830		23,802		311	117,904
Set nets.....	1,139	10,476		2,665		154	14,434
Gill nets.....	6,347	7,926		4,098		128	18,499
Hook and lines.....	4						4
Totals.....	19,791	99,232		30,625		593	150,241
ALL DISTRICTS COMBINED—							
1913							
Pound nets.....	310,691	227,032	11,359,330	967,898	11,606,957	56,397	24,536,306
Fish wheels.....							
Gill nets.....							
Set nets.....							
Drag seines.....	523,055	562,784	4,592,845	640,998	10,351,349	212,106	16,903,136
Purse seines.....							
Totals.....	842,746	809,816	15,952,175	1,608,896	21,957,306	268,502	41,439,441
1914							
Pound nets.....	393,214	324,621	28,810	729,001	2,250,208	114,609	3,839,663
Fish wheels.....							
Gill nets.....							
Set nets.....							
Drag seines.....	683,785	1,766,053	54,419	1,401,885	1,624,371	118,087	5,648,600
Purse seines.....							
Totals.....	1,076,999	2,090,874	83,229	2,129,886	3,874,579	232,696	9,488,268
1915							
Pound nets.....	459,234	297,364	2,912,704	684,022	595,512	79,608	5,028,444
Fish wheels.....	13,640			59	32,525	6,021	52,246
Gill nets.....	172,678	150,439	37,305	160,471	23,261	27,527	571,701
Set nets.....	21,612	53,422	33,463	85,939	4,077	12,464	215,977
Drag seines.....	36,473	20,884	2,309	12,038	7,704	16,606	66,532
Purse seines.....	36,729	1,570,488	4,396,553	391,002	198,051	19,551	6,612,354
Hook and lines.....	18						18
Reef nets.....	192	827	23,238	3,070	1,640		28,967
Drag bag nets.....	124	1,065	525	510			2,214
Totals.....	740,700	2,094,479	7,411,096	1,337,681	802,771	161,776	12,608,508

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
ALL DISTRICTS COMBINED—Continued							
1916							
Pound nets.....	459,235	297,365	12,724	684,022	565,513	79,609	2,128,468
Fish wheels.....	13,641			60	32,526	6,021	52,248
Gill nets.....	172,679	150,440	4,212	160,472	23,252	27,527	538,512
Set nets.....	21,612	53,422	2,465	85,939	4,077	12,465	179,980
Drag seines.....	36,474	20,885	33	12,608	7,705	16,606	94,311
Purse seines.....	36,730	1,570,488	59,702	391,003	199,032	19,552	2,272,507
Reef nets.....	192	828		3,071	1,641		5,732
Drag bag nets.....	125	1,065		510			1,690
Totals.....	740,688	2,094,483	76,136	1,337,685	862,776	161,780	5,273,548
1917							
Pound nets.....	443,384	211,061	4,426,534	625,380	2,854,969	57,328	8,618,637
Fish wheels.....	19,277				44,883	9,455	73,615
Gill nets.....	508,627	143,738	135,541	142,716	125,231	73,393	1,189,249
Set nets.....	38,216	71,071	9,890	93,081	4,270	22,063	239,980
Drag seines.....	28,190	29,566	4,536	32,224	3,249	14,900	112,665
Purse seines.....	49,738	833,168	8,745,689	236,311	1,998,675	2,561	11,866,442
Hook and lines.....	43,722	609	1,388	75,211	1,096	175	127,801
Reef nets.....	49	820	57,978	6,611	7,558		73,016
Bag nets.....	79						79
Totals.....	1,196,282	1,290,023	13,381,556	1,211,534	5,040,522	180,175	22,300,092
1918							
Pound nets.....	487,837	210,400	60,353	850,852	513,981	65,981	2,189,404
Fish wheels.....	9,655			11	101,783	6,676	118,125
Set nets.....	29,784	56,427	7,233	176,734	21,769	20,021	310,968
Gill nets.....	281,335	144,292	4,508	318,215	125,303	52,614	926,357
Drag seines.....	22,348	60,488	250	31,664	13,646	19,821	148,217
Purse seines.....	56,059	799,833	3,482	538,291	45,260	15,336	1,460,520
Reef nets.....	1,515	914	12,448	12,634	2,036		29,547
Hook and lines.....	83,410	251	28	175,333	1,678	207	260,907
Drag bag nets.....	129	2,060		78		101	2,358
Totals.....	973,072	1,274,655	88,392	2,108,812	825,456	180,816	5,446,203
1919							
Pound nets.....	361,232	380,687	2,081,961	823,117	462,161	55,964	4,165,172
Fish wheels.....	13,992				18,206	2,913	36,111
Set nets.....	26,084	136,950	9,666	117,201	4,029	18,463	312,393
Gill nets.....	258,530	217,566	38,325	202,239	16,224	29,784	762,666
Drag seines.....	25,175	80,892	32	25,241	9,404	14,037	154,781
Purse seines.....	89,069	1,112,404	2,513,521	443,876	283,993	3,029	4,445,892
Reef nets.....	962	3,404	29,042	9,639	3,210	50	46,307
Hook and lines.....	76,581	47	798	80,422	1,872	412	160,132
Drag bag nets.....		171					171
Totals.....	851,675	1,932,121	4,673,345	1,701,736	799,099	124,662	10,082,627
1920							
Pound nets.....	306,662	169,833	13,753	320,961	597,255	34,237	1,444,601
Fish wheels.....	11,193				18,419	6,862	36,494
Set nets.....	10,998	9,370	183	60,669	1,780	12,536	101,536
Gill nets.....	189,239	26,883	157	98,266	6,399	19,335	340,279
Drag seines.....	18,419	6,823		7,142	2,569	10,495	45,435
Purse seines.....	167,486	542,340	4,943	167,677	53,112	5,538	941,096
Reef nets.....	60	143	13	2,361	313		2,890
Hook and lines.....	59,313	233	667	84,751	240	411	145,615
Totals.....	771,370	755,625	19,716	741,727	680,077	89,434	3,057,949

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
ALL DISTRICTS COMBINED—Continued							
1921							
Pound nets.....	204,795	48,091	1,967,921	385,451	362,665	33,115	3,507,068
Fish wheels.....	10,222				24,288	3,313	37,823
Set nets.....	14,922	10,198	517	18,251	1,935	5,154	50,977
Gill nets.....	152,914	32,315	90,495	142,039	56,218	18,648	493,529
Drag seines.....	8,312	476	17,431	4,292	3,307	5,949	39,767
Bag nets.....			6,500	252	500		7,261
Purse seines.....	98,424	211,198	2,310,141	336,173	222,810	3,663	3,182,415
Reef nets.....	56	334	19,269	3,749	2,026		28,034
Hook and lines.....	19,034	2,207	429	89,090	8	178	110,946
Totals.....	568,679	304,819	4,412,712	980,203	1,174,357	75,020	7,545,790
1922							
Pound nets.....	257,023	138,827	26,353	600,006	424,062	51,059	1,498,230
Stationary fish wheels.....	4,035				31,928	2,018	37,980
Scow fish wheels.....	4,784			700	11,228	866	17,378
Set nets.....	4,531	22,365	26	28,562	7,096	6,489	69,969
Gill nets.....	97,096	38,561	291	72,104	57,043	17,004	283,259
Drag seines.....	12,173	408	577	6,732	17,461	12,243	49,584
Purse seines.....	5,184	405,965	5,037	370,810	88,277	606	875,839
Reef nets.....	8	250	11	3,164	682		4,115
Set lines.....				332			332
Hook and lines.....	6,195			78,806	139	154	85,354
Dip bag nets.....	62				111	4	177
Totals.....	391,691	606,310	32,315	1,161,326	640,397	90,241	2,922,286
1923							
Pound nets.....	270,891	200,814	2,443,230	714,866	363,587	93,369	4,089,757
Fish wheels.....	9,227				45,108	11,185	65,520
Set nets.....	3,609	69,538		27,053	6,241	5,654	112,145
Gill nets.....	165,332	104,218	22,487	93,137	117,541	47,767	551,102
Drag seines.....	72,964	9,458	7,392	17,454	9,956	17,852	136,076
Bag nets.....				50			50
Purse seines.....	4,743	528,542	3,021,732	344,806	142,355	96	4,042,384
Reef nets.....	3	963	38,371	3,241	1,950		44,558
Hook and lines.....	7,390	16	824	55,840		57	64,127
Set lines.....	20	83		3			106
Totals.....	534,779	913,792	5,534,086	1,236,510	686,738	175,960	9,101,885
1924							
Pound nets.....	331,498	275,480	84,698	681,387	641,991	64,017	2,079,071
Stationary fish wheels.....	3,605	220		858	3,249	535	8,467
Scow fish wheels.....	3,393	220		868	2,433	144	7,045
Set nets.....	4,946	52,074		24,411	1,348	2,265	84,944
Gill nets.....	206,725	235,155	1,922	186,698	16,413	44,515	689,428
Drag seines.....	23,314	1,456	561	16,639	8,212	15,248	66,420
Purse seines.....	2,515	713,258	12,649	299,500	99,098	2,317	1,129,337
Reef nets.....	42	917	225	4,735	3,211		9,150
Hook and lines.....	4,767	10	1	41,241	3	72	46,094
Dip bag nets.....	175					249	424
Smelt drag bag nets.....	16	241		202			459
Set lines.....	3			1		2	6
Totals.....	580,899	1,277,031	100,046	1,236,550	775,958	129,364	4,119,843

YEARLY COMPARATIVE TABLE OF SALMON CATCH, SEGREGATED AS TO GEAR AND SPECIES—Continued.

DISTRICT AND GEAR WITH WHICH TAKEN	Number Chinook Salmon	Number Dog or Chum Salmon	Number Hump-back Salmon	Number Silver Salmon	Number Sockeye Salmon	Number Steelhead Salmon	Totals
ALL DISTRICTS COMBINED—Continued							
1925							
Pound nets.....	369,958	353,127	1,954,771	585,801	933,086	67,467	4,264,210
Stationary fish wheels.....	12,528			6,868	14,008	25,598	59,002
Scow fish wheels.....	3,846				4,522	2,943	11,311
Set nets.....	5,109	49,800	4	15,770	1,171	3,902	75,816
Gill nets.....	269,525	165,504	37,443	131,986	16,114	49,259	670,130
Drag seines.....	29,009	2,839	23,605	5,198	14,231	10,876	85,758
Purse seines.....	9,238	436,408	4,602,188	321,352	287,329	101	5,656,616
Reef nets.....	19	744	47,236	2,802	2,747		53,548
Hook and lines.....	2,483		98	24,997	962	237	28,777
Dip bag nets.....	82	38		18			139
Smelt drag bag nets.....	33	1,085		445			1,513
Set lines.....	19	27				8	54
Totals.....	702,149	1,009,582	6,665,245	1,095,237	1,274,170	160,390	10,906,873
1926							
Pound nets.....	373,591	250,435	21,673	570,610	353,722	121,852	1,691,883
Stationary fish wheels.....	951				1,594	650	3,195
Scow fish wheels.....	1,061				1,063	1,455	3,607
Set nets.....	5,940	16,209		8,506	16,132	22,846	69,723
Gill nets.....	199,639	154,165	590	104,269	52,390	40,818	551,881
Drag seines.....	40,634	1,715	379	4,521	20,976	36,174	104,399
Purse seines.....	5,409	838,371	1,764	232,721	90,523	205	1,169,053
Reef nets.....	77	241	6	2,957	735		4,016
Hook and lines.....	2,372	85	117	22,209	65	176	25,084
Smelt drag bag nets.....	11	230		264		40	545
Set lines.....	10				3		13
Totals.....	629,906	1,261,541	24,489	946,175	537,233	224,216	3,623,459

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CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE.

Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Clams and Mussels	Number of Crabs	Pounds of Carp	Pounds of Cod	Pounds of Devil Fish	Pounds of Dog Fish	Pounds of Dolly Varden Trout	Pounds of Flounders	Pounds of Halibut	Pounds of Herring	Pounds of Perch
PUGET SOUND DISTRICT—											
Pound nets.....				2,365	286	76,870	269	3,244	373	173	100
Set nets.....				3,680		1,700					1,538
Gill nets.....			12			4,000				538,599	49,804
Drag seines.....				11,786	70	6,000		6,212		173,900	1,075
Purse seines.....				157	350						
Reef nets.....											
Hook and line.....			13	6,902	25,711		230	1,149	2,628	233,970	1,199
Smelt drag bag nets.....				18,205	1,450					1,614,600	14,352
Brush weirs.....											100
Beam trawls.....				15,876	40			128,611	2,111		325
Set lines.....				4,875	96,674	201,825					500
Clam bait.....	911,314										
Crabs.....	4,000	354,741									
Dip bag nets.....										450	
Totals.....	915,314	354,741	25	63,906	123,581	290,395	499	139,216	5,112	2,621,682	69,991
Value.....	\$27,459.42	\$36,952.37	\$1.50	\$2,556.24	\$6,179.05	\$590.79	\$74.85	\$2,784.32	\$766.80	\$26,216.92	\$3,449.55

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Continued.
Fiscal Year 1928.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Red Snapper	Pounds of Sand Dabs	Pounds of Sea Bass	Pounds of Skates	Pounds of Shrimp	Pounds of Smelt	Pounds of Sole	Number of Sturgeon	Pounds of Other Food Fish	Pounds of Shad	Total Value
PUGET SOUND DISTRICT—											
Concluded											
Found nets.....	422			3,000			5	40	3,646		
Set nets.....			9,305								
Gill nets.....			500								
Drag seines.....				280		245,023	5,980		1,077		
Furse seines.....			6			100					
Reef nets.....											
Hook and line.....			1,210								
Smelt drag bag nets.....						114,388	150		1,800		
Beam trawls.....				485	50,624		195,669		215,317		
Set lines.....	7	160	8	340							
Oiams.....	12		65								
Clam bait.....											
Crabs.....											
Dip bag nets.....						450					
Totals.....	441	160	11,184	4,105	50,624	360,790	201,954	40	221,840		
Value.....	\$13 23	\$16 00	\$1,342 09	\$22 10	\$5,062 40	\$22,463 81	\$8,073 16	\$168 00	\$4,436 80		\$156,684 39

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE
—Continued.
Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Carp	Pounds of Smelt	Number of Sturgeon	Pounds of Shad	Total Value
COLUMBIA RIVER DISTRICT—					
First class pound nets.....			213	88,041	
Second class pound nets.....			56	16,986	
Stationary fish wheels.....			79	2,284	
Scow fish wheels.....				1,064	
Set nets.....			211	88	
Gill nets.....		15,215	973	106,811	
Drag seines.....	761,233		39	164,645	
Hook and lines.....					
Dip bag nets.....		806,099			
Set lines.....			475		
Totals.....	761,233	881,314	2,046	380,819	
Value.....	\$45,676 98	\$13,219 71	\$5,728 80	\$7,616 38	\$72,241 87

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE
—Continued.
Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Clams and Mussels	Pounds of Dolly Varden Trout	Pounds of Perch	Number of Sturgeon	Total Value
GRAYS HARBOR DISTRICT—					
Pound nets.....					
Set nets.....				1	
Gill nets.....				9	
Smelt drag bag nets.....			1,342		
Crab.....					
Clam.....	651,891				
Hook and lines.....		46	135		
Clam bait.....	2,690				
Totals.....	654,581	46	1,477	10	
Value.....	\$39,274 86	\$6 90	\$73 85	\$40 20	\$39,395 81

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE
—Continued.
Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Clams and Mussels	Number of Crabs	Number of Sturgeon	Total Value
WILLAPA HARBOR DISTRICT—				
Pound nets.....			10	
Set nets.....				
Gill nets.....			200	
Crab.....		469,437		
Clams.....	584,179			
Clam bait.....	59,417			
Drag seines.....				
Totals.....	643,596	469,437	210	
Value.....	\$38,615 76	\$58,679 58	\$844 20	\$98,139 54

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Continued.
Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Clams and Mussels	Number of Crabs	Pounds of Carp	Pounds of Cod	Pounds of Devil Fish	Pounds of Dog Fish	Pounds of Dolly Varden Trout	Pounds of Flounders	Pounds of Halibut	Pounds of Herring	Pounds of Perch
ALL DISTRICTS COMBINED—											
Pound nets.....				2,365	286	76,870	289	3,244	373	173	100
Stationary fish wheels.....											
Scow fish wheels.....											
Set nets.....				3,680		1,700					1,836
Gill nets.....			12			4,000					
Drag seines.....			761,283	11,786	70	6,000		6,212		538,569	49,804
Furse seines.....				157	350					178,900	1,075
Keef nets.....											
Hook and line.....			13	6,902	25,711		276		2,628		1,324
Dip bag nets.....											
Smelt drag bag nets.....				18,265	1,450			1,149		450	
Beam trawls.....				15,876	40			128,611		236,370	15,684
Brush weirs.....											325
Set lines.....										1,614,600	100
Clams.....	2,147,334			4,875	95,674	201,825			2,111		500
Clam bait.....	66,107										
Crabs.....		824,175									
Totals.....	2,213,491	824,178	761,308	63,906	123,581	290,886	545	139,216	5,112	2,621,692	70,468
Value.....	\$105,350 04	\$95,631 95	\$45,678 48	\$2,556 24	\$6,179 05	\$560 79	\$81 75	\$2,784 32	\$766 80	\$26,216 92	\$3,623 40

CATCH OF FOOD AND SHELL FISH (OTHER THAN SALMON) AND VALUE—Continued.
Fiscal Year 1926.

DISTRICT AND GEAR WITH WHICH TAKEN	Pounds of Red Snapper	Pounds of Sand Dabs	Pounds of Sea Bass	Pounds of Skates	Pounds of Shrimp	Pounds of Smelt	Pounds of Sole	Number of Sturgeon	Pounds of Other Food Fish	Pounds of Shad	Total Value
ALL DISTRICTS COMBINED—											
Concluded											
Pound nets.....	422		9,395	3,000			5	319	3,646	106,027	
Stationary fish wheels.....								79		2,284	
Scow fish wheels.....										1,964	
Set nets.....			500					212		88	
Gill nets.....						15,530		1,182		106,811	
Drag seines.....			6	280		245,028	5,980	39	1,077	164,645	
Purse seines.....							160				
Reef nets.....											
Hook and line.....											
Dip bag nets.....			1,210			896,540					
Smelt drag bag nets.....						114,388					
Beam trawls.....							150		1,800		
Brush weirs.....	7	160	8	485	50,624		195,659		215,517		
Set lines.....			65	340				475			
Clams.....											
Clam balt.....											
Crabs.....											
Totals.....	441	160	11,184	4,105	50,624	1,242,104	201,054	2,306	221,840	380,819	
Value.....	\$13 23	\$16 00	\$1,342 08	\$82 10	\$5,062 40	\$45,683 52	\$8,078 16	\$6,781 20	\$4,436 80	\$7,616 38	\$668,461 01

FOOD AND SHELL FISH CANNED.
Fiscal Year 1926.

DISTRICTS	Number of 49-lb. Cases	Value
PUGET SOUND DISTRICT—		
Chinook salmon	27,779½	\$305,930 45
Dog or chum salmon.....	112,201	550,404 73
Humpback salmon	2,123	11,901 36
Silver salmon	120,950	1,020,429 36
Sockeye salmon	44,567½	720,786 01
Steelhead	63	718 91
Clams and mussels.....	9,581	70,255 34
Clam nectar	824	2,245 69
Other food and shell fish.....		
Totals.....	318,094	\$2,682,671 75
COLUMBIA RIVER DISTRICT—		
Chinook salmon	105,791	\$1,483,327 08
Dog or chum salmon.....	6,738	29,109 40
Silver salmon	17,103	172,323 46
Sockeye salmon	9,391½	167,909 97
Steelhead	7,147½	77,145 73
Shad	5,016½	20,088 81
Other food and shell fish.....	18	268 00
Totals.....	151,206½	\$1,950,672 45
GRAYS HARBOR DISTRICT—		
Chinook salmon	502	\$3,241 80
Dog or chum salmon.....	8,357	39,753 93
Steelhead	190	1,064 00
Silver salmon	756	5,672 80
Sockeye salmon	1,729	29,332 20
Clams and mussels.....	44,069	360,313 04
Clam nectar	1,171	2,634 75
Other food and shell fish.....	16	218 00
Totals.....	57,060	\$441,230 52
WILLAPA HARBOR DISTRICT—		
Chinook salmon	1,491	\$13,517 00
Dog or chum salmon.....	8,205	34,320 00
Silver salmon	1,400	8,240 00
Humpback salmon	275	1,375 00
Clams and mussels.....	14,833	125,826 35
Clam nectar	16	32 00
Other food and shell fish.....	15	196 00
Totals.....	26,235	\$183,506 35
ALL DISTRICTS COMBINED—		
Chinook salmon	135,653½	\$1,806,016 33
Dog or chum salmon.....	135,701	653,538 08
Humpback salmon	2,403	13,276 36
Silver salmon	140,209	1,207,165 62
Sockeye salmon	55,688	917,028 19
Steelhead	7,400½	78,928 64
Clams and mussels.....	68,483	556,394 73
Clam nectar	2,011	4,912 34
Shad	5,016½	20,088 81
Other food and shell fish.....	49	682 00
Totals.....	552,614½	\$5,258,081 07

YEARLY COMPARATIVE TABLE OF FOOD AND SHELL FISH CANNED.

NUMBER OF FORTY-EIGHT POUND OASES

PUGET SOUND DISTRICT	NUMBER OF FORTY-EIGHT POUND OASES											Totals	Other Food and Shell Fish	Totals	Grand Totals		
	Ch'ook	Dog	Hump-back	Silver	Sockeye	Steel-head	Totals	Clams and Mussels	Olam Nectar	Crabs	Shad						
1890.....	13,495	4,000		4,000	72,979		8,000										8,000
1896 (Spring).....	26,550			82,640			189,114										189,114
1896 (Fall).....	11,200						86,550										86,550
1898.....	24,500		254,000	98,600	252,000		801,800										801,800
1900.....	33,350			129,200	512,500		833,500										833,500
1902.....	30,049	33,482		85,817	229,800		331,350										331,350
1903.....	14,500	12,001		181,228	372,301		651,659										651,659
1904.....	17,900	52,494		117,845	167,211		478,488										478,488
1906.....	1,804	41,067	70,992	117,845	107,943		296,272										296,272
1906.....	8,130	149,218		94,497	825,453		1,018,641										1,022,141
1907.....	1,814	50,249	433,423	119,472	178,748		430,602										430,602
1908.....	95,210	47,607	6,075	128,922	93,122		698,080			1,250							698,080
1909.....	22,273	58,174	349,449	130,932	170,951		448,765			1,100							448,765
1910.....	10,064	146,942	108,162	162,755	972,180		1,532,068										1,532,068
1911.....	21,680	101,880	1,050,338	255,323	132,340		1,561,561			1,150							1,561,561
1912.....	22,081	62,730	1,202	157,117	103,442		436,572			12,000							436,572
1913.....	1,805	55,786	802,040	62,492	1,692,942		2,585,065										2,585,065
1914.....	27,140	290,476	1,016	153,932	339,786		1,311,817										1,311,817
1915 (8 months).....	26,942	423,728	589,195	185,521	85,490		1,254,376										1,254,376
1916.....	18,130	105,749	398,445	60,143	82,349		585,816										585,816
1917 (4 months).....	70,918	218,977	1,130,163	115,860	454,336		1,990,258										1,990,258
1918.....	62,820	264,922	6,607	235,795	52,587		622,732										622,732
1919.....	71,190	529,997	437,703	201,693	67,087		1,307,783										1,307,783
1920.....	27,482	47,831	4,921	25,821	62,751		168,334										168,334
1921.....	25,662	27,315	375,900	65,303	95,687		589,847										589,847
1922.....	16,108	100,632	469,893	120,908	50,003		757,564										757,564
1923.....	16,319	143,074	6,689	84,850	70,749		301,821										301,821
1924.....	29,983	42,715	557,695	172,007	104,973		926,963										926,963
1925.....	27,779	112,201	2,128	120,950	44,567		307,689										307,689
1926.....																	

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YEARLY COMPARATIVE TABLE OF FOOD AND SHELL FISH CANNED—Continued.

	NUMBER OF FORTY-EIGHT POUND CASES											Grand Totals	
	Ch'ook	Dog	Hump-back	Silver	Socketeye	Steel-head	Totals	Clams and Mussels	Crabs	Shad	Other Food and Shell Fish		Totals
1890	167,050	.....	.....	.....	.....	.....	167,050	.....	.....	.....	.....	.....	167,050
1896 (Spring)	871,851	.....	.....	.....	16,985	40,769	429,175	.....	.....	.....	.....	.....	429,175
1896 (Fall)	7,102	.....	.....	44,006	8,700	8,700	59,810	.....	.....	.....	.....	.....	59,810
1898	78,450	.....	.....	9,750	15,645	8,680	111,525	.....	.....	.....	.....	.....	111,525
1899	86,800	.....	.....	17,210	9,620	6,470	119,600	.....	.....	.....	.....	.....	119,600
1900	71,800	.....	.....	19,460	7,720	8,380	127,120	.....	.....	.....	.....	.....	127,120
1901	77,910	10,253	.....	4,435	4,235	.....	96,813	.....	.....	.....	.....	.....	96,813
1902	76,800	10,000	.....	4,400	4,140	.....	96,440	.....	.....	.....	.....	.....	96,440
1904	180,688	18,508	.....	26,890	.....	.....	179,813	.....	.....	.....	.....	.....	179,813
1906	120,698	18,233	.....	18,071	914	.....	157,896	.....	.....	.....	.....	.....	157,896
1907	103,272	19,414	.....	25,262	316	.....	148,254	.....	.....	.....	.....	.....	148,254
1908	87,252	18,173	.....	36,469	364	.....	142,270	.....	.....	.....	.....	.....	142,270
1908	53,822	12,811	.....	17,077	680	.....	114,050	.....	.....	.....	.....	.....	114,050
1908	38,374	6,583	.....	21,190	11,577	5,188	100,252	.....	.....	.....	.....	.....	100,252
1910	68,466	16,373	.....	32,061	2,478	.....	119,696	.....	.....	.....	.....	.....	119,696
1911	106,891	22,284	.....	41,258	963	2,440	176,546	.....	.....	.....	.....	.....	176,546
1912	71,236	18,064	.....	23,853	1,250	6,266	131,358	.....	.....	.....	.....	.....	131,358
1913	77,846	18,062	.....	22,507	3,189	2,600	124,334	.....	.....	.....	.....	.....	124,334
1914	86,398	27,045	.....	29,072	11,226	3,963	168,797	.....	.....	.....	.....	.....	168,797
1915 (8 months)	146,491	25,063	.....	2,240	2,240	10,963	168,989	.....	.....	.....	.....	.....	168,989
1915 (4 months)	56,202	37,404	.....	20,074	1,345	11,318	226,404	.....	.....	.....	.....	.....	226,404
1916	22,820	8,608	56	6,714	81	3,090	41,259	.....	.....	.....	.....	.....	41,259
1917	146,140	14,589	.....	15,899	2,801	6,063	186,522	.....	.....	.....	.....	.....	186,522
1918	145,311	12,173	.....	36,746	19,450	9,669	221,579	.....	.....	.....	.....	.....	221,579
1918	128,068	39,279	2,117	54,927	2,329	7,148	213,968	.....	.....	.....	.....	.....	213,968
1920	140,319	4,911	.....	7,896	1,237	4,977	158,902	.....	.....	.....	.....	.....	158,902
1921	104,349	691	.....	8,454	2,174	8,956	125,073	.....	.....	.....	.....	.....	125,073
1922	89,096	7,009	.....	25,850	17,506	8,047	160,900	.....	.....	.....	.....	.....	160,900
1923	94,821	16,401	.....	27,915	19,084	13,103	171,227	.....	.....	.....	.....	.....	171,227
1924	170,522	13,889	563	27,952	2,131	9,617	199,157	.....	.....	.....	.....	.....	199,157
1925	170,151	30,238	84	20,752	2,400	3,486	226,521	226,521
1926	106,791	6,736	17,103	9,391	7,147	146,171	146,171

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YEARLY COMPARATIVE TABLE OF FOOD AND SHELL FISH CANNED—Continued.

GRAYS HARBOR DISTRICT	NUMBER OF FORTY-EIGHT POUND CASES											Totals	Grand Totals				
	Ch'ook	Dog	Hump-back	Silver	Sockeye	Steel-head	Totals	Clams and Mussels	Clam Nectar	Crabs	Shad			Other Food and Shell Fish			
1896 (None packed).....							21,274									21,274	9,900
1896.....	7,816	4,180		9,278			9,900									9,900	12,800
1896.....	5,100			4,800			12,800									12,800	19,600
1899.....	5,300			7,300			19,600									19,600	31,500
1900.....	6,700			12,900			31,500									31,500	
1902.....	4,000	17,500		10,000													
1903 (None packed).....							29,600									29,600	26,600
1904.....	4,539	10,500		11,570			22,050									22,050	22,000
1906.....	2,050	7,000		13,000			22,000									22,000	14,000
1906.....	2,500	8,000		11,500			14,000									14,000	24,500
1907.....	1,000	3,500		9,500			14,000									14,000	27,787
1908.....	1,000	3,500		9,500			14,000									14,000	21,408
1908.....	2,000	500		10,000	1,500		51,130									51,130	108,680
1910.....	15,495	13,867		21,768			87,272									87,272	33,025
1911.....	11,650	22,435		43,297	9,870		58,981									58,981	50,852
1912.....	12,502	21,354	1,830	21,435	1,850		43,953									43,953	94,805
1913.....	2,196	9,405	2,708	8,620	20,879	55	72,110									72,110	20,981
1914.....	5,888	19,022	4,496	22,532	18,756	496	71,977		1,600							71,977	31,092
1915 (8 months).....	4,432 ¹	23,861	4,034	15,016 ¹	24,026		66,616									66,616	20,442
1916.....	11,020	29,839	3,746	11,343	10,099		9,497									9,497	11,206 ¹
1917 (4 months).....	3,642 ¹	3,002	50	1,984 ¹	216		55,942					403				55,942	16,078
1917.....	13,518	12,889	11,279	13,598	4,530	129	15,516									15,516	72,020
1918.....	10,664 ¹	5,573	1,373	29,512	2,464 ¹	15	49,611									49,611	20,758
1919.....	5,196	30,193	1,750	13,662	710	11	51,482									51,482	35,611
1920.....	861 ¹	263 ¹		412 ¹	235		1,535 ¹									1,535 ¹	33,616
1921.....	1,308	2,746		2,814			6,898					6,300				6,898	66,050
1922.....	207	14,315	150	5,206	19,213		39,091									39,091	68,368
1923.....	3,676	28,062		5,142	15,001	1,500	53,381									53,381	22,002
1924.....	174	27,110		4,827	40,327		21,014									21,014	75,383
1925.....	3,157	23,358		7,651	3,313	300	37,780									37,780	30,430
1926.....	592	8,557		756	1,729	190	11,824					16				11,824	46,256

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YEARLY COMPARATIVE TABLE OF FOOD AND SHELL FISH CANNED—Continued.

WILLAPA HARBOR DISTRICT	NUMBER OF FORTY-EIGHT POUND CASES													Grand Totals				
	Ch'ook	Dog	Hump-back	Silver	Sockeye	Steel-head	Totals	Clams and Mussels	Crabs	Shad	Other Food and Shell Fish	Totals						
1890 (None packed)																		24,941
1893	4,551	8,450		11,940			9,809											15,674
1898	5,885			10,210			12,400											16,580
1900	6,220			9,700			12,400											19,100
1902	5,836	24,528		9,128			2,380											39,492
1903	2,300	1,200		7,500			5,800											5,800
1904	3,000	15,000		4,300			7,500											25,500
1905	4,650	6,000		5,340			4,300											14,950
1906	4,000	5,100		9,228			5,240											14,440
1907	3,530	624		9,228			5,240											13,392
1908	4,017	10,517		9,470			5,223											20,457
1909	2,650	6,397		5,070			4,700											12,517
1910	2,923	6,439		5,096			5,096											14,508
1911	5,717	10,432		9,238			9,238											25,497
1912	6,123	9,533		8,577			9,238											25,497
1913	67	8,879		4,462			2,547											28,148
1914	2,924	6,724		7,179			8,107											11,486
1915 (6 months)	3,842	5,327		2,214			2,214											16,887
1916	1,513	5,059		1,600			1,600											11,383
1917 (4 months)	3,632	5,014		1,795			2,143											8,172
1917	1,720	4,516		5,249			5,249											10,391
1918	1,921	2,657		5,249			1,491											8,379
1919	1,152	9,301		1,688														1,546
1920	62																	9,925
1921	623	2,719		1,683			141											10,291
1922	1,168	2,293		1,549			56											8,820
1923	275	6,402		45														17,452
1924	168	21,969		1,104			644											6,051
1925	13,500	19,581																6,113
1926	1,491	8,205		270														10,085
1928	1,491	8,205		270														12,916
																		6,459
																		7,350
																		9,183
																		14,864

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YEARLY COMPARATIVE TABLE OF FOOD AND SHELL FISH CANNED—Concluded.

NUMBER OF FORTY-EIGHT POUND CASES

	Ch'ook	Dog	Hump-back	Silver	Socketeye	Steel-head	Totals	Clams and Mussels	Clam Nectar	Crabs	Shad	Other Food and Shell Fish	Totals	Grand Totals
1880	167,050	4,000		4,000	8,000	49,497	175,050						175,050	175,050
1881	430,905	12,630		147,886	267,645	8,080	730,864						730,864	730,864
1882	100,615			121,959	267,645	8,080	498,809						498,809	498,809
1883	122,620			137,250	525,120	6,470	1,042,430						1,042,430	1,042,430
1900	127,310			172,990	257,520	8,380	546,170						546,170	546,170
1901	106,440	121,882		248,000	1,230,797	2,000	1,649,119						1,649,119	1,649,119
1902	117,736	145,753		169,380	376,536		749,464						749,464	749,464
1903	156,208	23,291		110,240	112,170		579,818						579,818	579,818
1904	129,102	72,340		181,326	112,170		528,185						528,185	528,185
1905	183,749	71,435		168,305	826,367		1,213,507						1,213,507	1,213,507
1906	93,606	72,549		136,599	179,064		615,306			1,250			616,556	616,556
1907	82,257	72,004		433,423	93,486		597,312			1,100			600,412	600,412
1908	96,948	183,571		349,449	985,257	5,188	1,658,377			1,150			1,660,627	1,660,627
1909	148,008	137,111		1,050,358	349,176	2,440	1,849,876			12,000			1,861,876	1,861,876
1910	121,061	112,281		7,494	196,512	6,296	655,039						661,335	661,335
1911	82,014	92,245		894,748	96,195	2,656	2,764,838						2,767,484	2,767,484
1912	132,850	344,780		563,229	213,354	4,449	1,075,014						1,079,463	1,079,463
1913	183,714	476,990		142,544	181,901	11,322	1,046,565			1,600			1,048,165	1,048,165
1914	196,340	470,747		1,141,442	401,667	3,021	3,118,681						3,121,702	3,121,702
1915 (8 months)	292,296	250,920		7,980	896,392	6,186	2,240,101						2,246,287	2,246,287
1916 (4 months)	291,921	285,325		443,283	70,126	8,714	1,027,749						1,036,474	1,036,474
1917	295,546	698,710		4,921	33,134	7,221	1,040,715						1,048,000	1,048,000
1918	168,724	52,763		376,041	79,274	8,955	728,853						737,808	737,808
1919	131,942	33,421		3,191	150,740	8,047	492,335						500,496	500,496
1920	122,382	90,959		469,893	154,013	15,276	999,738						1,015,017	1,015,017
1921	114,075	151,517		8,385	113,244	9,747	546,518						555,312	555,312
1922	127,533	206,042		557,170	200,400	3,925	1,205,374						1,213,299	1,213,299
1923	216,861	115,842		2,403	140,209	7,400	477,055						484,455	484,455
1924	136,653	135,701			56,088								192,741	192,741
1925														
1926														

FOOD AND SHELL FISH, FRESH AND PRESERVED (OTHER THAN CANNED) AND VALUE.
Fiscal Year 1926.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	Number Pounds	Value	Number Pounds	Value	Number Pounds	Value	Number Pounds	Value	Number Pounds	Value
FRESH—										
Chinook salmon	2,444,246	\$882,415 67	545,020	\$54,562 60	17,411	\$1,741 10	191,613	\$19,161 30	3,338,890	\$458,890 07
Dog salmon	4,432,080	177,307 20	67,805	678 95	66,360	1,990 80	437,100	13,114 80	5,004,065	193,000 85
Humpback salmon	12,190	541 80							12,190	541 80
Silver salmon	2,687,464	218,356 45	48,023	3,662 51	112,070	5,663 50	156,900	7,819 50	3,004,447	234,831 96
Snakeye salmon	20,321	2,621 70	28,282	3,730 79	33,210	4,428 00			81,883	10,889 49
Steelhead	48,546	5,825 52	48,887	3,422 00	27,670	4,980 60			125,143	14,255 41
Carp			659,263	39,556 78			40	7 20	659,263	39,556 78
Clams and mussels	1,083,831	32,500 53			88,186	2,291 16	1,430	85 80	1,122,967	34,877 49
Crabs (Number)	870,102	38,562 50			90,972	11,371 50	629,425	76,678 00	1,600,400	126,602 00
Cod	144,963	5,774 52							144,963	5,774 52
Devil fish	119,887	5,994 35							119,887	5,994 35
Dog fish	101,935	263 87							101,935	263 87
Dolly varden trout	101,989	58 35							101,989	58 35
Flofishers	103,727	2,074 54							103,727	2,074 54
Hallbut	2,977	931 05							2,977	931 05
Herring	189,306	1,803 96							189,306	1,803 96
Mackerel	30	3 00							30	3 00
Porch	77,316	3,965 80			1,027	51 35			78,343	3,917 15
Red snapper	56	1 68							56	1 68
Sand dabs	432	43 20							432	43 20
Shad			30	1 80					30	1 80
Sea bass	4,332	673 94							4,332	673 94
Skates	1,517	179 24							1,517	179 24
Striped	48,724	4,872 40							48,724	4,872 40
Smelt	417,812	37,062 06	550,069	29,400 27					1,297,921	64,008 35
Sole	585,345	11,421 80							585,345	11,421 80
Sturgeon	32,856	3,398 40	711	106 65			300	40 20	29,447	3,515 25
All other food fish	5,852	177 04							5,852	177 04
Totals.....	12,823,426	\$966,917 39	2,278,880	\$131,563 94	385,906	\$32,458 01	1,416,363	\$116,906 80	16,905,520	\$1,217,851 14
PRESERVED—										
Frozen	10,073,096	\$1,000,138 66	626,000	\$109,600 00	6,000	\$800 00			11,615,066	\$1,104,638 66
Kippered	2,688,062	420,240 80	10,400	1,960 00					2,698,462	422,200 80
Mild cured	2,814,225	718,006 25							2,814,225	718,006 25
Salted	115,900	6,159 60	2,700	215 00					118,600	6,374 60
Smoked	288,300	37,668 60	37,000	4,400 00	450	67 50			325,750	42,106 10
Totals.....	16,780,753	\$2,182,258 00	686,100	\$109,775 00	6,450	\$947 50			17,473,303	\$2,292,965 50
GRAND TOTALS.....	29,004,179	\$3,119,170 39	2,964,980	\$241,343 94	930,356	\$33,425 51	1,416,363	\$116,906 80	34,378,823	\$3,510,816 64

FISH BY-PRODUCTS.
Fiscal Year 1926.

OUTPUT	QUANTITY	VALUE
Oil	78,362 gal.	\$22,956 82
Fish meal	10.57 tons	677 00
Fertilizer	158.00 tons	7,686 00
Poultry food	653.00 tons	18,893 00
Shells	129.00 tons	890 00
Fresh eggs	39.00 tons	3,351 96
Total value.....		\$53,808 78

APPROXIMATE AVERAGE PRICE—

Oil	\$20 29 per gal.
Fish meal	67 70 per ton
Fertilizer	44 53 per ton
Poultry food	28 93 per ton
Shells	6 90 per ton
Fresh eggs	85 85 per ton

HALIBUT HANDLED BY DEALERS.
Fiscal Year 1926.

Fresh.....9,449,960 pounds, valued at \$1,383,423.16
 Approximate average price..... \$00 15 per pound

Halibut is taken mostly in the Bering Sea and Alaskan waters and brought to Puget Sound to be marketed.

CODFISH HANDLED BY DEALERS.
Fiscal Year 1926.

Total cured1,772,830 pounds, valued at \$67,875 00

APPROXIMATE AVERAGE PRICE—
 Cured..... \$00 04 per pound

STATE OYSTER RESERVES.

Plat	LOCATION	County	Acres
.....	Bay Center Reserves Nos. 1-2.....	Pacific.....	254.520
139	Oases Inlet Reserves Nos. 1-2-3 (North Bay).....	Mason.....	176.860
189	Clifton Reserves—1 to 6, 22-2 west and 1, 22-1 west.....	Mason.....	523.194
187	Dewatto Bay Reserve No. 2.....	Mason.....	62.406
90	Dog Fish Bay Reserve—Poulsbo Tract No. 1.....	Kitsap.....	63.920
89	Dog Fish Bay Reserve—West of Keyport Tracts 1-2.....	Kitsap.....	81.490
102	Eld Inlet Reserve (Mud Bay).....	Thurston.....	46.990
136	Hamahama Reserve No. 1.....	Mason.....	44.058
139	Hammersley Inlet Reserve—Reserves A-B, Old Reserve 1-2-3-4 (Oakland Bay).....	Mason.....	246.912
139	Hammersley Inlet Reserve—Reserve No. 5 (Oakland Bay)	Mason.....	5.760
133	Lilliwaup Bay Reserve—Nos. 1-2.....	Mason.....	40.004
.....	Long Island Slough Reserve.....	Pacific.....	578.932
.....	Long Island Reserve Extension.....	Pacific.....	5,990.255
.....	Nemah Reserve.....	Pacific.....	2,553.662
93	Oak Passage Reserve No. 1.....	Mason.....	23.132
59	Ostrich Bay Reserve.....	Kitsap.....	150.690
89	Ostrich Bay Reserve—Tracts 1-2.....	Kitsap.....	60.754
86	Ostrich Bay Reserve—Tracts 1-2-3.....	Kitsap.....	37.683
.....	Port Discovery Bay Reserve.....	Jefferson.....	133.740
87	Port Orchard Reserve—Tracts 1-2.....	Kitsap.....	122.500
132	Reserve East of Tahuyeh Bay—No. 7.....	Mason.....	14.530
136	Reserve opposite Chinom Point No. 2.....	Mason.....	21.046
134	Skykomish River Reserve—No. 1.....	Mason.....	22.630
135	Tahuyeh Bay Reserve—No. 1.....	Mason.....	31.689
99	Totten Inlet Reserve—10 lots (Oyster Bay).....	Thurston.....	711.363
99	Totten Inlet Reserve Nos. 1-2 (Oyster Bay).....	Thurston-Mason.....	24.063
99	Totten Inlet Reserve "Pot Hole" (Oyster Bay).....	Mason.....	9.015
135	Union City Reserve—No. 2.....	Mason.....	179.130
.....	Willapa River Reserve.....	Pacific.....	476.500
Total.....			12,689.011

SEED OYSTERS SOLD FROM STATE RESERVES.

Fiscal Year 1926.

DISTRICT AND RESERVE	County	Number of Sacks	Value
FUGET SOUND DISTRICT—			
Clifton Reserve	Mason	1,066.9	\$322 74
Oakland Bay	Mason	1,368.1	2,736 20
Oyster Bay	Mason	786.6	1,573 20
Mud Bay	Thurston	109.1	190 93
Totals.....		3,300.7	\$5,322 07

Number of licenses issued to take oysters from state reserves, 11at \$5.00 each—\$55.00

OYSTER INDUSTRY.**Fiscal Year 1926.**

(Compiled from reports received from 34 companies or individuals in Puget Sound District, and 8 in Willapa Harbor District)

OYSTERS MARKETED			
	No. Sacks	Value	
PUGET SOUND DISTRICT—			
Native	27,740		\$349,682 25
*Eastern	5,000		30,000 00
Totals.....		32,740	\$379,682 25
WILLAPA HARBOR DISTRICT—			
Native	1,297		\$9,289 75
Eastern	1,600		21,181 00
Totals.....		2,997	\$30,470 75
BOTH DISTRICTS COMBINED—			
Native	29,037		\$358,972 00
Eastern	6,690		51,181 00
Totals.....		35,727	\$410,153 00

* Includes transplanted Japanese oysters.

AVERAGE VALUE OF OYSTERS PER SACK.**Fiscal Year 1926.**

	Puget Sound District	Willapa Harbor District
Native	\$12 65	\$7 16
Eastern	6 00	12 53

OYSTER LANDS.
Fiscal Year 1928.

NUMBER OF ACRES AND VALUE

DISTRICT	Owned		Leased		Value		Total Lands		Total Values		Native Producing		Eastern Producing		Value		Total Producing		Total Values		
	Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value	Acres	Value	
Puget Sound.....	2,027.31	\$1,218,186 50	44	\$86,200 00	2,071.31	\$1,224,386 50	549	\$369,061 50	549	\$369,061 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Willapa Harbor..	5,566.00	231,410 00	230	23,000 00	5,736.00	254,410 00	856	41,300 00	856	41,300 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	7,593.31	\$1,439,596 50	274	\$49,200 00	7,807.31	\$1,488,796 50	1,444	\$240,361 50	1,444	\$240,361 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Average values were substituted where valuations were not given. From the Puget Sound District 34 reports show a valuation of \$1,234,386.50 on a total of 2,071.31 acres (an average of \$59.94 per acre) and of this number 549 acres were under cultivation and valued at \$369,061.50. All figures concerning the Japanese oyster lands are included under Puget Sound owned oyster beds.

From the Willapa Harbor District 8 reports show a valuation of \$254,410.00 on a total of 7,807.31 acres (an average of \$32.58 per acre) and of this number 1,680 acres were under cultivation and valued at \$154,500.00.

Of the above owned and leased lands 434.4 acres are diked, the value of same being \$568,060.00.

*** VALUE OF FISHERIES PRODUCT.**
Fiscal Year 1926.

PRODUCT	Value
Food and shell fish canned.....	\$5,258,061 07
Food and shell fish handled fresh.....	1,217,861 14
Food and shell fish preserved (other than canned).....	2,292,995 50
Fish by-products	53,808 78
Halibut	1,383,423 16
Codfish	67,875 00
Oysters	410,153 00
Total.....	\$10,684,187 65

* Value based on average wholesale price. The halibut and codfish are not strictly Washington products, as these fish are taken mostly in the waters of Bering Sea and Alaska and brought to Puget Sound to be marketed.

YEARLY COMPARATIVE TABLE OF VALUE OF FISHERIES PRODUCT.

	Food and Shell Fish Canned	Food and Shell Fish Handled Fresh	Food and Shell Fish Preserved (Other Than Canned)*	Fish By-products	Halibut	Foodfish	Oysters	Totals
1905.....	\$6,614,391 80	\$3,438,209 00	.....	\$44,564 00	.....	.....	\$264,169 00	\$10,361,393 80
1906.....	8,157,275 50	3,473,300 00	.....	19,885 00	.....	.....	282,409 00	7,242,478 50
1907.....	3,580,100 50	2,716,800 00	.....	19,885 00	.....	.....	300,817 00	6,577,602 50
1908.....	3,184,800 00	3,714,800 00	.....	16,540 00	.....	.....	307,700 00	6,525,840 00
1909.....	4,255,825 00	3,768,800 00	.....	41,750 00	.....	.....	581,000 00	13,524,010 00
1910.....	2,227,822 00	2,768,800 00	.....	21,770 00	.....	.....	668,500 00	7,822,122 00
1911.....	2,043,013 47	3,511,177 77	.....	79,000 00	.....	.....	830,380 00	7,844,246 77
1912.....	13,124,753 53	1,077,339 57	\$638,719 53	82,721 43	.....	.....	316,680 50	15,215,674 73
1913.....	6,813,624 70	1,757,236 64	242,880 54	74,731 43	.....	.....	900,609 80	9,193,244 46
1914.....	5,451,414 55	1,529,860 72	40,774 90	114,439 36	.....	.....	334,641 63	7,407,145 49
1915 (8 months).....	1,406,712 00	1,529,860 72	95,500 00	118,775 00	.....	.....	238,875 29	1,867,862 74
1916.....	17,074,726 00	729,241 17	515,000 75	258,153 80	\$3,447,637 24	\$338,422 34	252,377 15	23,854,986 41
1917 (4 months).....	8,270,124 45	1,033,100 24	329,004 32	193,109 85	2,408,743 74	349,521 59	317,982 51	13,854,167 10
1918.....	12,854,177 67	1,240,314 06	430,442 05	131,622 46	2,804,944 73	308,322 52	329,185 70	18,201,289 26
1919.....	4,821,110 55	1,528,839 69	694,305 80	57,742 55	2,731,982 23	359,061 08	256,859 67	10,110,941 63
1920.....	5,227,340 24	663,729 78	1,616,100 89	125,343 24	1,430,331 54	54,255 00	20,217 50	9,404,631 02
1921.....	7,032,114 06	1,338,783 83	1,604,800 98	134,482 39	1,238,530 47	73,246 47	313,109 10	10,307,098 10
1922.....	7,381,437 85	1,338,783 83	2,268,502 38	121,679 44	1,869,683 01	948 35	329,049 27	12,807,008 23
1923.....	5,214,945 37	1,181,830 33	2,232,701 95	87,063 00	1,294,400 04	695 71	329,405 01	10,381,504 64
1924.....	10,153,800 94	1,049,021 02	2,343,074 45	52,804 49	1,135,327 73	100,000 00	375,753 70	15,311,223 26
1925.....	5,238,061 07	1,217,861 14	2,282,986 50	53,806 78	1,383,423 10	67,875 00	410,158 00	10,684,157 06
1926.....	.....	.....	.....	.....	.....	.....	.....	.....

* For the years 1906 to 1912, inclusive, the fish preserved (other than canned) is included in the amount of fish handled fresh.

COMPARATIVE TABLE OF THE CAPACITIES OF THE STATE SALMON HATCHERIES.

HATCHERIES	CAPACITY IN 1924		CAPACITY IN 1928	
	Hatchery	Ponds	Hatchery	Ponds
PUGET SOUND DISTRICT—				
Chambers Creek	6,720,000	5,000,000	6,240,000*	2,000,000*
Dungeness	1,800,000	1,000,000	1,760,000**
Elwha	1,020,000	.....	.....	.....
Green River	18,000,000	6,400,000	22,760,000†	9,000,000†
Green River No. 2	4,400,000	.....	.....	.....
Nooksack	4,480,000	1,000,000	4,480,000	1,000,000
North Fork Nooksack	2,720,000	.....	.....	.....
Pilchuck	3,040,000	.....	3,040,000	.....
Puyallup	5,120,000	200,000	6,000,000†	200,000
Samish	14,160,000	3,000,000	13,800,000*	8,000,000
Skykomish	6,720,000	.....	6,720,000	.....
Snohomish	4,640,000	1,500,000**
Totals	73,720,000	18,100,000	64,600,000	15,200,000
COLUMBIA RIVER DISTRICT—				
Chinook	8,200,000	2,000,000	8,200,000	4,800,000†
Cowlitz .....	.....	.....	10,160,000†	.....
Kalama	14,560,000	4,800,000	12,960,000*	7,200,000†
Pateros-Methow	2,560,000	4,000,000	2,560,000	3,000,000*
Spokane	2,000,000	.....	.....*	.....*
Wenatchee	1,920,000	.....	1,920,000	.....
Wind River	4,960,000	.....	.....*	.....*
Totals	29,200,000	10,800,000	30,800,000	15,000,000
GRAYS HARBOR DISTRICT—				
Chehalis	11,760,000	.....	11,760,000	.....
Chehalis No. 2	6,720,000	.....	6,720,000	.....
Humtulsips	3,840,000	.....	3,200,000*	.....
Totals	22,320,000	.....	21,680,000	.....
WILLAPA HARBOR DISTRICT—				
Naselle	3,200,000	1,000,000	3,200,000	1,000,000
North River	2,720,000	500,000**
Willapa	5,600,000	400,000	7,350,000†	400,000
Totals	11,520,000	1,900,000	10,550,000	1,400,000
TOTAL CAPACITIES—				
All hatcheries combined	136,760,000	30,800,000	127,630,000*	31,600,000†

* Indicates decrease.

† Indicates increase.

Previous to and including 1924 hatchery and rearing pond capacities such as the Elwha, Green River No. 2, Middle Fork, Nooksack, Snohomish, Spokane, Wind River and the North River stations were included in the biennial reports. These hatcheries have not been operated since 1922, and at some of them, operations were abandoned previous to that date. The reports also included capacities of temporary, outdoor hatchery equipment and experimental rearing ponds. The capacities shown for 1928 include only permanently constructed and used equipment.

OUTPUT OF SALMON FROM THE STATE HATCHERIES.
Fiscal Year 1926.

	Number Females Spawned	Number Eggs Taken	No. Eggs Received From Other Hatcheries	No. Eggs On Hand April 1, 1926	Number Eggs Lost	Number Eggs Shipped	No. Eggs On Hand March 31, 1927	Number Fry Hatched	Number Fry On Hand April 1, 1926	No. Fry Lost	Number Fry Shipped	Number Fry Planted	Number Fry On Hand March 31, 1927	Number Fry Reared In Ponds	
CHINOOK SALMON															
PUGET SOUND DIST.—															
Duaneuss.....	75	381,000	.....	.....	90,000	.....	.....	926,000	.....	.....	.....	252,000	.....	.....
Green River.....	2,077	10,373,300	2,000,000	.....	527,500	.....	.....	11,842,000	8,393,700	24,800	.....	10,389,200	9,821,700	10,389,200
Nooksack.....	136	698,100	1,500,000	.....	215,100	.....	.....	1,836,000	.....	83,000	.....	1,800,400	.....	649,400
Puyallup River.....	37	155,000	510,000	.....	4,815	.....	.....	630,184	.....	2,825	.....	627,369	.....	.....
Samish.....	.....	.....	1,000,000	.....	15,500	.....	.....	984,500	.....	6,795	.....	977,705	.....	.....
Skykomish.....	14	67,000	390,000	.....	4,925	.....	.....	1,062,475	.....	1,345	.....	1,051,130	.....	.....
Totals.....	2,319	11,469,000	6,000,000	.....	796,441	.....	.....	10,053,159	8,393,700	119,395	.....	15,106,794	9,821,700	10,389,600
COLUMBIA RIVER DISTRICT—															
Chinook.....	398	1,002,000	1,000,000	.....	26,300	.....	.....	2,575,700	1,319,300	4,700	.....	1,310,300	2,571,000	1,588,000
Cowlitz River.....	534	2,635,000	.....	.....	110,000	.....	.....	2,825,000	.....	31,000	.....	2,494,000	.....	.....
Lewis River.....	48	273,250	.....	.....	26,050	.....	.....	247,200	.....	5,300	.....	241,900	.....	.....
Leavenworth.....	.....	.....	600,000	.....	2,500	.....	.....	597,500	.....	4,500	.....	593,000	.....	.....
Kanama.....	4,483	24,641,000	.....	.....	951,000	.....	.....	14,650,000	7,300,000	12,100	.....	15,837,900	6,100,000	14,000,000
Kittitas.....	.....	.....	400,000	.....	700	.....	.....	390,300	.....	1,200	.....	389,100	.....	.....
Pacros Methow.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	880	.....	308,420	.....	.....
Totals.....	5,438	29,151,250	2,000,000	.....	1,110,550	.....	.....	20,364,700	9,610,200	59,680	.....	21,281,220	9,264,000	16,488,000
GRAYS HARBOR DISTRICT—															
Chehalis.....	110	480,000	.....	.....	19,000	.....	.....	461,000	.....	2,300	.....	458,700	.....	.....
Totals.....	110	480,000	.....	.....	19,000	.....	.....	461,000	.....	2,300	.....	458,700	.....	.....
WILLAPA HARBOR DISTRICT—															
Naselle River.....	1,940	8,217,000	.....	.....	660,000	.....	.....	2,348,000	.....	1,595	.....	2,346,405	.....	1,500,000
Willapa.....	577	2,883,500	4,200,000	.....	131,300	.....	.....	6,652,200	.....	9,155	.....	6,643,045	.....	70,000
Totals.....	2,526	10,801,100	4,200,000	.....	800,900	.....	.....	9,000,200	.....	10,750	.....	8,989,450	.....	1,570,000
RECAPITULATION—															
Puget Sound.....	2,319	11,469,000	6,000,000	.....	796,441	.....	.....	16,053,159	8,393,700	119,395	.....	15,106,794	9,821,700	10,389,600
Columbia River.....	5,438	29,151,250	2,000,000	.....	1,110,550	.....	.....	20,364,700	9,610,200	59,680	.....	21,281,220	9,264,000	16,488,000
Grays Harbor.....	110	480,000	.....	.....	19,000	.....	.....	461,000	.....	2,300	.....	458,700	.....	.....
Willapa Harbor.....	2,526	10,801,100	4,200,000	.....	800,900	.....	.....	9,000,200	.....	10,750	.....	8,989,450	.....	1,570,000
Grand Totals.....	10,388	51,892,650	12,200,000	.....	2,726,891	.....	.....	47,110,659	18,038,900	192,065	.....	45,836,104	19,085,700	28,997,600

* 10,000 eggs shipped to Phillips Trout Farm. † 50,000 eggs shipped to University of Washington. † 1,900,000 eggs shipped to Alaska.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.
Fiscal Year 1926.

	Number Females Spawmed	Number Eggs Taken	No. Eggs Received From Other Hatcheries	No. Eggs On Hand April 1, 1926	Number Eggs Lost	Number Eggs Shipped	Eggs On Hand March 31, 1927	Number Fry Hatched	Number Fry On Hand April 1, 1926	No. Fry Lost	Number Fry Shipped	Number Fry Planted	Number Fry On Hand March 31, 1927	Number Fry Reared In Ponds
DOG SALMON														
PUGET SOUND DIST.—														
Chambers Creek.....	1,583	4,374,000	.....	125,000	522,000	2,748,000	125,000	984,000	.....	.....	.....	444,000	540,000	.....
Green River.....	2,072	6,249,000	2,733,000	.....	427,000	15,000	.....	8,550,000	626,700	5,475	.....	2,730,025	6,340,000	50,000
Nooksack.....	533	1,377,000	.....	.....	73,250	.....	.....	1,394,350	427,000	4,350	.....	427,000	1,340,000	.....
Puyallup River.....	300	1,072,700	.....	.....	78,904	.....	.....	1,094,796	96,100	6,400	.....	65,975	988,521	.....
Samish.....	1,163	3,388,000	.....	.....	165,550	.....	.....	3,192,450	1,518,140	18,480	.....	2,868,140	1,823,970	1,534,070
Salt Water Pond.....	.....	.....	.....	.....	.....	.....	.....	.....	1,500,000	.....	.....	1,500,000	.....	1,500,000
Totals.....	5,720	16,461,300	2,733,000	.....	1,285,704	2,748,000	125,000	15,025,596	4,068,540	34,705	.....	8,065,740	10,963,691	3,084,070
COLUMBIA RIVER DISTRICT—														
Chinook.....	254	645,500	.....	.....	12,900	.....	.....	592,600	.....	1,290	.....	591,400	.....	.....
Totals.....	254	645,500	.....	.....	12,900	.....	.....	592,600	.....	1,290	.....	591,400	.....	.....
GRAYS HARBOR DISTRICT—														
Chehalis.....	427	1,180,000	.....	.....	57,000	.....	.....	1,132,000	.....	1,000	.....	1,131,000	.....	.....
Totals.....	427	1,180,000	.....	.....	57,000	.....	.....	1,132,000	.....	1,000	.....	1,131,000	.....	.....
WILLAPA HARBOR DISTRICT—														
Willapa.....	92	227,500	.....	.....	21,700	.....	.....	205,800	.....	535	.....	205,265	.....	.....
Totals.....	92	227,500	.....	.....	21,700	.....	.....	205,800	.....	535	.....	205,265	.....	.....
RECAPITULATION—														
Puget Sound.....	5,720	16,461,300	2,733,000	.....	1,285,704	2,748,000	125,000	15,025,596	4,068,540	34,705	.....	8,065,740	10,963,691	3,084,070
Columbia River.....	254	645,500	.....	.....	12,900	.....	.....	592,600	.....	1,290	.....	591,400	.....	.....
Grays Harbor.....	427	1,180,000	.....	.....	57,000	.....	.....	1,132,000	.....	1,000	.....	1,131,000	.....	.....
Willapa Harbor.....	92	227,500	.....	.....	21,700	.....	.....	205,800	.....	535	.....	205,265	.....	.....
Grand Totals.....	6,493	18,483,300	2,733,000	.....	1,387,304	2,748,000	125,000	16,955,996	4,068,540	37,440	.....	9,963,405	10,963,691	3,084,070

*10,000 eggs shipped to Clover Creek Hatchery. † 5,000 eggs shipped to University of Washington.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.

Fiscal Year 1926.

	Number Females Spawmed	Number Eggs Taken	No. Eggs Received From Other Hatcher's	No. Eggs On Hand April 1, 1926	Number Eggs Lost	Number Eggs Shipped	No. Eggs On Hand March 31, 1927	Number Fry Hatched	Number Fry On Hand April 1, 1926	No. Fry Lost	Number Fry Shipped	Number Fry Planted	Number Fry On Hand March 31, 1927	Number Fry Reared In Ponds
HUMPBACKS
PUGET SOUND DIST.— Salt Water Pond.....	*1,500,000	200,000	.....	1,300,000	.....	1,300,000
Totals.....	1,500,000	200,000	.....	1,300,000	.....	1,300,000

* 1,500,000 fry received from U. S. Bureau, Quilcene, Washington.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.
Fiscal Year 1926.

SILVER SALMON	Number Females Spawmed	Number Eggs Taken	No. Eggs Received From Other Hatcheries	No. Eggs On Hand		Number Eggs Shipped	Number Fry Hatched	Number Fry On Hand April 1, 1926	Number Fry Lost	Number Fry Shipped	Number Fry Planted	Number Fry On Hand March 31, 1927	Number Fry Reared In Ponds
				April 1, 1926	March 31, 1927								
PUGET SOUND DIST.—													
Chambers Creek.....	56	136,500	.....	13,500	.....	.....	123,000	.....	.....	.....	64,000	59,000	.....
Dungeness.....	110	365,000	.....	35,000	.....	.....	.....	.....	.....	.....	11,024,000	3,043,750	3,000,000
Great River.....	1,726	5,045,500	.....	188,500	.....	*205,000	.....	10,524,000	58,850	.....	2,341,400	988,000	961,400
Nooksack.....	603	1,788,000	.....	45,550	.....	.....	1,040,000	2,282,000	2,200	.....	900,000	.....	.....
Pilchuck River.....	432	1,525,083	.....	79,820	.....	.....	1,310,000	652,475	5,250	.....	652,050	1,395,175	.....
Samsish.....	3,775	10,024,000	.....	400,400	.....	.....	12,300,850	7,316,025	34,505	.....	10,804,000	8,658,970	4,237,295
Skykomish.....	2,965	10,309,500	.....	373,450	.....	.....	9,471,952	4,053,027	6,151	.....	6,988,817	3,530,000	.....
Totals.....	9,719	29,705,083	.....	1,202,220	.....	205,000	6,716,813	25,897,400	55,728,727	101,956	32,864,267	18,564,904	7,808,095
COLUMBIA RIVER DISTRICT—													
Chinook.....	179	454,500	.....	16,100	.....	.....	438,400	.....	.....	.....	435,600	.....	165,940
Kalama.....	.....	.....	6,000,000	118,300	.....	.....	3,900,000	250,000	2,800	.....	250,000	3,900,000	250,000
Totals.....	179	454,500	6,000,000	134,400	.....	.....	4,338,400	250,000	2,800	.....	685,600	3,900,000	415,940
GRAYS HARBOR DISTRICT—													
Cheshal No. 3.....	11,864	39,945,000	.....	6,000,000	.....	.....	10,530,000	3,827,500	42,350	.....	10,287,000	4,058,150	.....
Cheshal No. 5.....	.....	.....	6,040,000	292,250	.....	.....	6,057,050	2,801,505	15,070	.....	5,145,800	3,680,985	.....
Humphals.....	418	1,235,050	.....	159,560	.....	.....	3,031,452	1,409,258	29,585	.....	3,776,700	708,425	.....
Totals.....	12,312	42,180,050	8,000,000	9,232,202	.....	17,000,000	9,794,540	10,615,262	78,095	.....	19,209,500	8,458,570	.....
WILLAPA HARBOR DISTRICT—													
Naselle River.....	1,126	3,289,500	.....	113,500	.....	.....	1,886,500	600,000	600	.....	600,000	1,885,900	1,000,000
Willapa.....	1,126	3,289,500	.....	222,800	.....	.....	3,137,500	2,108,070	4,255	.....	2,220,105	3,021,150	1,873,045
Totals.....	2,252	6,579,000	2,000,000	336,300	.....	.....	5,024,000	2,708,070	4,855	.....	2,820,105	4,907,050	2,473,045
RECAPITULATION—													
Puget Sound.....	9,719	29,705,083	.....	1,202,220	.....	205,000	6,716,813	25,897,400	55,728,727	101,956	32,864,267	18,564,904	7,808,095
Columbia River.....	179	454,500	6,000,000	134,400	.....	.....	4,338,400	250,000	2,800	.....	685,600	3,900,000	415,940
Grays Harbor.....	12,312	42,180,050	8,000,000	9,232,202	.....	17,000,000	9,794,540	10,615,262	78,095	.....	19,209,500	8,458,570	.....
Willapa Harbor.....	2,252	6,579,000	2,000,000	336,300	.....	.....	5,024,000	2,708,070	4,855	.....	2,820,105	4,907,050	2,473,045
Grand Totals.....	33,346	127,728,533	13,482,002	14,673,430	.....	17,205,000	18,522,623	54,788,342	96,815,060	193,216	55,579,622	35,880,524	10,757,089

* 200,000 eggs shipped to Lincoln Park, Chicago, Ill.
• 5,000 eggs shipped to University of Washington.

† 1,000,000 eggs shipped to U. S. Bureau, Elwell Creek, Wash.

OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.
Fiscal Year 1926.

	Number Females Spawned	Number Eggs Taken	No. Eggs Received From Other Hatcheries	No. Eggs On Hand April 1, 1926	Number Eggs Lost	Number Eggs Shipped	No. Eggs On Hand March 31, 1927	Number Fry Hatched	Number Fry On Hand April 1, 1926	No. Fry Lost	Number Fry Shipped	Number Fry Planted	Number Fry On Hand March 31, 1927	Number Fry Reared in Ponds
STEELHEAD														
PUGET SOUND DIST.—														
Dungeness.....	152	522,000	.....	.....	52,000	.....	.....	470,000	.....	.....	170,000	400,000	.....	.....
Green River.....	143	322,250	.....	35,200	4,200	.....	289,250	61,000	2,000	.....	41,000	65,000	.....	65,000
Nooksack.....	95	80,000	.....	.....	1,325	.....	8,000	79,675	.....	500	.....	79,175	.....	19,175
Samish.....	431	1,006,300	.....	286,400	79,800	401,000	450,500	1,933,100	.....	21,200	410,000	842,100	.....	366,225
Skykomish.....	124	569,000	.....	168,425	42,070	.....	126,000	468,456	17,465	1,580	252,000	334,300	.....	.....
Totals.....	925	3,410,550	.....	490,025	180,295	401,000	878,750	2,445,530	19,465	23,380	721,000	1,720,635	.....	477,400
GRAYS HARBOR DISTRICT—														
Chehalis.....	355	1,247,000	.....	333,700	90,500	216,700	543,500	739,000	20,000	8,450	719,000	626,550	.....	.....
Humptulps.....	62	122,450	.....	78,110	2,309	151,651	29,625	17,515	.....	185	917,330	.....	.....	.....
Totals.....	417	1,369,450	.....	411,810	92,809	368,351	573,125	747,515	20,000	3,635	137,330	626,550	.....	.....
WILLAPA HARBOR DISTRICT—														
Willapa.....	293	762,500	.....	498,000	60,000	200,000	275,000	723,500	99,575	2,805	1920,000	530,535	89,735	.....
Totals.....	293	762,500	.....	498,000	60,000	200,000	275,000	723,500	99,575	2,805	1920,000	530,535	89,735	.....
RECAPITULATION—														
Puget Sound.....	925	3,410,550	.....	490,025	180,295	401,000	878,750	2,445,530	19,465	23,380	721,000	1,720,635	.....	477,400
Grays Harbor.....	417	1,369,450	.....	411,810	92,809	368,351	573,125	747,515	20,000	3,635	137,330	626,550	.....	.....
Willapa Harbor.....	293	762,500	.....	498,000	60,000	200,000	275,000	723,500	99,575	2,805	200,000	530,535	89,735	.....
Grand Totals.....	1,635	5,542,500	.....	1,397,835	333,104	968,351	1,721,875	3,910,545	139,040	29,770	1,168,330	2,877,720	89,735	477,400

*461,000 eggs shipped to Whatcom County Game Comm.
 *170,000 fry shipped to Chatham County Game Comm.
 *200,000 fry shipped to Skagit County Game Comm.
 *250,000 fry shipped to Snohomish County Game Comm.
 *1,000 fry shipped to University of Washington.
 *60,000 eggs shipped to Grays Harbor County Game Comm.
 *60,000 eggs shipped to Lewis County Game Comm.
 *96,700 eggs shipped to Grays Harbor County Game Comm.
 *151,051 eggs shipped to Grays Harbor Game Comm.
 *120,000 fry shipped to Lewis County Game Comm.
 *17,339 fry shipped to Grays Harbor County Game Comm.
 *100,000 eggs shipped to Clark County Game Comm.
 *100,000 eggs shipped to Cowlitz County Game Comm.
 *100,000 fry shipped to Skamania County Game Comm.
 *101,000 fry shipped to Pacific County Game Comm.

**OUTPUT OF SALMON FROM THE STATE HATCHERIES—Continued.
Fiscal Year 1926.**

ALL SPECIES COMBINED	Number Females Spawned	Number Eggs Taken	No. Eggs Received From Other H'cher's	No. Eggs On Hand April 1, 1926	Number Eggs Lost	Number Eggs Shipped	No. Eggs On Hand March 31, 1927
PUGET SOUND DISTRICT—							
Chambers Creek	1,641	4,510,500			585,500	2,743,000	125,000
Dungeness	367	1,158,000			116,000		320,000
Green River	5,978	21,996,250	4,733,000	35,200	1,147,200	220,000	889,250
Nooksack	1,437	3,863,300	1,500,000	59,700	335,225		761,150
Pilchuck							
Puyallup River.....	798	2,723,683	510,000		102,540		136,163
Samish	5,419	15,930,300	1,000,000	3,920,450	751,250	401,000	1,957,300
Skykomish	3,043	10,945,500	900,000	611,025	425,945		4,026,700
Salt Water Pond.....							
Totals.....	18,683	61,127,533	8,733,000	4,626,375	3,474,660	3,364,000	7,715,563
COLUMBIA RIVER DISTRICT—							
Chinook	801	2,662,000	1,000,000		55,300		
Cowlitz River	534	2,635,000			110,000		
Lewis River	48	273,250			26,050		
Leavenworth			600,000		2,500		
Kalama	4,483	24,641,000	6,000,000		1,069,300	9,040,000	1,981,700
Kittitas							
Pateros-Methow			400,000		700		
Totals.....	5,866	30,211,250	8,000,000		1,263,850	9,040,000	1,981,700
GRAYS HARBOR DISTRICT—							
Chehalis	12,756	33,861,000		6,333,700	2,939,500	17,216,700	7,285,500
Chehalis No. 2.....			8,000,000	2,235,700	202,250		1,976,400
Humtulpis	510	1,358,100	2,000,000	1,075,612	127,929	151,061	1,106,765
Totals.....	13,266	35,219,100	8,000,000	9,645,012	3,169,679	17,367,751	10,367,665
WILLAPA HARBOR DISTRICT—							
Naselle River	1,949	8,217,600	2,000,000		783,100	5,200,000	
Willapa	2,101	6,890,000	4,200,000	608,500	436,500	200,000	314,000
Totals.....	4,050	15,077,600	6,200,000	608,500	1,219,600	5,400,000	314,000
RECAPITULATION—							
Puget Sound	18,683	61,127,533	8,733,000	4,626,375	3,474,660	3,364,000	7,715,563
Columbia River	5,866	30,211,250	8,000,000		1,263,850	9,040,000	1,981,700
Grays Harbor	13,266	35,219,100	8,000,000	9,645,012	3,169,679	17,367,751	10,367,665
Willapa Harbor	4,050	15,077,600	6,200,000	608,500	1,219,600	5,400,000	314,000
Grand Totals.....	41,865	141,635,483	30,933,000	14,879,887	9,126,780	35,171,751	20,378,928

OUTPUT OF SALMON FROM STATE HATCHERIES—Concluded.
Fiscal Year 1926.

ALL SPECIES COMBINED	Number Fry Hatched	Number Fry Received	No. Fry On Hand April 1, 1926	No. Fry Lost	Number Fry Shipped	Number Fry Planted	No. Fry On Hand March 31, 1927	No. Fry Beared in Ponds
PUGET SOUND DISTRICT—								
Chambers Creek	1,107,000					508,000	509,000	
Dungeness	722,000				70,000	652,000		
Green River	25,009,000		19,447,000	89,125	1,000	24,208,825	20,156,050	13,504,200
Nooksack	4,326,625		2,709,600	90,650		4,656,975	2,238,600	1,229,975
Pilehuck			900,000			900,000		
Puyallup River	2,934,980		748,575	14,475		1,375,384	2,293,696	
Samish	17,741,200		8,834,765	81,080	400,000	15,581,945	10,512,940	6,164,590
Skykomish	8,092,830		4,070,492	9,029	250,000	8,374,337	3,530,009	2,900,000
Salt Water Pond.....		1,500,000	1,500,000	200,000		2,300,000		
Totals.....	59,932,685	1,500,000	38,210,432	484,356	721,000	59,057,466	39,380,295	23,698,765
COLUMBIA RIVER DISTRICT—								
Chinook	3,606,700		1,319,300	8,700		2,346,300	2,571,000	1,754,900
Cowlitz River	2,525,000			31,000		2,494,000		
Lewis River	247,200			5,300		241,900		
Leavenworth	597,500			4,500			593,000	
Kalama	18,550,000		7,550,000	12,100		16,087,900	10,000,000	15,150,000
Kittitas			990,900	1,200		989,700		
Pateros-Methow	309,300			880		308,420		
Totals.....	25,925,700		9,860,200	63,680		22,558,220	13,164,000	16,904,900
GRAYS HARBOR DISTRICT—								
Chehalis	12,853,000		3,377,500	49,100	120,000	12,508,250	4,058,150	
Chehalis No. 2.....	6,057,050		2,801,505	15,670		5,145,890	3,698,995	
Humptulps	3,048,967		1,469,258	20,770	17,330	3,779,700	703,425	
Totals.....	21,959,017		8,148,263	85,540	137,330	21,425,840	8,458,570	
WILLAPA HARBOR DISTRICT—								
Naselle River	4,234,500		600,000	2,195		2,946,405	1,885,900	2,600,000
Willapa	10,719,000		2,207,645	16,750	200,000	9,599,010	3,110,885	1,443,045
Totals.....	14,953,500		2,807,645	18,945	200,000	12,545,415	4,996,785	4,043,045
RECAPITULATION—								
Puget Sound	59,932,685	1,500,000	38,210,432	484,356	721,000	59,057,466	39,380,295	23,698,765
Columbia River	25,925,700		9,860,200	63,680		22,558,220	13,164,000	16,904,900
Grays Harbor	21,959,017		8,148,263	85,540	137,330	21,425,840	8,458,570	
Willapa Harbor	14,953,500		2,807,645	18,945	200,000	12,545,415	4,996,785	4,043,045
Grand Totals.....	122,770,902	1,500,000	59,026,540	652,521	1,058,330	115,586,941	65,999,650	44,646,710

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SUMMARY OF OUTPUT OF SALMON FROM STATE HATCHERIES.
Fiscal Year 1926.

	Chinook	Dog	Silver	Steelhead	Humpback	Totals
Number females spawned.....	10,388	6,493	23,349	1,635		41,865
EGGS—						
Taken by state hatcheries.....	51,862,950	18,482,300	65,716,783	5,542,500		141,685,483
On hand April 1, 1926.....			13,482,052	1,307,835		14,879,887
Grand totals.....	51,862,950	18,482,300	79,198,785	6,940,335		156,515,370
Lost.....	2,732,801	1,387,304	4,673,430	333,154		9,126,789
Furnished to University of Washington (experimental purposes).....	50,000	5,000	5,000			60,000
Furnished to county hatcheries for hatching and planting as follows—						
Whatcom county.....				401,000		401,000
Clark county.....				100,000		100,000
Lewis county.....				60,000		60,000
Cowlitz county.....				100,000		100,000
Grays Harbor county.....				307,751		307,751
Phillips trout farm.....	10,000					10,000
Furnished Alaska Territorial Fish Commission.....	1,960,000		1,000,000			1,960,000
Furnished U. S. Bureau, Elwell Creek.....		10,000	1,000,000			1,000,000
Clower Creek Hatchery.....						10,000
Lincoln Park, Chicago, Illinois.....						10,000
On hand March 31, 1927.....		125,000	18,532,653	1,721,875		20,000
On hand March 31, 1927.....						20,378,928
Hatched.....	47,110,050	16,055,996	54,788,302	8,916,545		122,770,902
On hand April 1, 1926.....	18,003,900	4,058,540	26,815,000	139,040		50,026,540
Received from U. S. Bureau, Quileene, Washington.....					1,500,000	1,500,000
Furnished to counties (planted in lieu of trout).....				1,067,330		1,067,330
Lost.....	192,035	37,440	193,216	29,770	200,000	652,021
University of Washington.....						1,000
Planted.....	45,807,164	9,903,405	55,570,622	2,877,750		115,856,941
On hand March 31, 1927.....	19,088,700	10,903,691	35,830,254	59,735		65,999,650

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PERCENTAGES OF LOSS ON EGGS AND FRY.
Fiscal Year 1926.

SPECIE	Loss on Eggs Per Cent	Loss on Fry Per Cent
Chinook	5.3	.4
Chum	7.5	.2
Silver	7.1	.4
Steelhead	6.0	.7

AVERAGE NUMBER OF EGGS TAKEN TO FEMALE.
Fiscal Year 1926.

SPECIE	Average Number Eggs
Chinook	4,995
Chum	2,847
Silver	2,814
Steelhead	3,389

RECORD OF FRY HANDLED AT SALT WATER POND.
Fiscal Year 1926.

SPECIES	Number of Fry	Placed in Pond	Loss	Released	
				Date	Number
Humpbacks	115,000	Fiscal Year 1925	None Recorded	Aug. 25, 1926	115,000
Chums	1,500,000	Fiscal Year 1926	None Recorded	Aug. 25, 1926	1,500,000
Humpbacks	1,500,000	Fiscal Year 1926 (Jan. 10, 1927)	200,000	June 20, 1927	1,300,000

YEARLY COMPARATIVE TABLE OF FRY PLANTED FROM THE STATE HATCHERIES.

DISTRICT AND YEAR	Chinook	Dog	Humpback	Silver	Sockeye	Steelhead	Totals
PUGET SOUND DISTRICT—							
1913.....	4,238,006	4,617,223	963,158	5,522,894	49,792	2,638,430	18,070,468
1914.....	11,048,615	9,076,166	578,504	97,694,446	12,942	2,741,766	61,362,438
1915.....	21,810,517	18,060,089	2,961,113	28,731,000	912,936	4,649,814	77,105,469
1916.....	31,810,518	18,060,089	2,961,114	28,731,001	912,937	4,649,814	77,105,474
1917.....	34,971,546	42,732,607	6,086,259	27,369,469	6,552,070	4,341,323	122,108,276
1918.....	21,926,000	16,936,325	.....	6,908,802	946,500	2,970,452	49,387,039
1919.....	6,526,900	13,686,325	1,315,500	13,795,200	.....	3,065,980	38,189,895
1920.....	3,716,414	59,434,745	718,600	20,672,694	.....	2,684,757	96,577,180
1921.....	15,128,990	24,096,712	3,475,300	25,586,155	284,800	1,979,563	70,530,710
1922.....	8,666,578	2,359,180	16,314,627	17,776,276	.....	814,464	46,214,935
1923.....	6,646,267	3,560,700	6,880,944	52,906,668	.....	1,686,724	71,681,908
1924.....	5,449,470	6,819,574	29,588,675	61,694,113	.....	4,684,730	97,696,562
1925.....	7,478,786	8,027,263	4,608,715	44,528,478	5,700	1,023,670	66,672,622
1926.....	15,106,734	8,006,740	1,300,000	32,894,267	.....	1,720,965	58,057,496
COLUMBIA RIVER DISTRICT—							
1913.....	20,736,362	462,065	.....	402,416	.....	.....	21,219,207
1914.....	20,156,375	3,786,132	.....	1,346,430	.....	.....	24,943,023
1915.....	20,925,297	12,422,601	.....	1,346,431	.....	1,869,413	36,660,741
1916.....	20,925,297	12,422,601	.....	3,281,793	.....	1,869,414	38,866,513
1917.....	39,649,915	8,981,640	.....	2,921,130	.....	1,937,720	26,962,560
1918.....	21,883,100	210,600	.....	1,096,800	.....	2,629,800	28,901,900
1919.....	20,816,500	2,369,600	.....	2,638,200	.....	1,614,600	28,006,600
1920.....	2,352,750	21,401,080	.....	2,113,666	.....	18,241,990	18,904,979
1921.....	15,428,350	484,955	.....	794,410	.....	.....	17,694,724
1922.....	17,620,469	493,231	.....	570,518	.....	.....	20,150,866
1923.....	16,500,975	480,000	.....	4,467,866	.....	.....	20,408,346
1924.....	15,203,000	66,732	.....	5,397,474	.....	.....	20,408,346
1925.....	14,639,142	66,732	.....	685,600	.....	.....	22,666,220
1926.....	21,281,220	591,400	.....	.....	.....	.....	.....
GRAYS HARBOR DISTRICT—							
1913.....	139,000	497,300	.....	2,600,000	.....	701,118	8,637,418
1914.....	96,250	1,230,000	.....	4,136,840	.....	561,900	6,021,990
1915.....	674,760	3,404,465	.....	4,824,207	.....	801,868	9,206,296
1916.....	674,760	3,404,465	.....	4,824,208	.....	801,867	9,206,300
1917.....	2,978,268	17,725,949	.....	12,275,990	.....	967,975	33,948,202
1918.....	279,200	4,763,000	.....	6,017,656	.....	1,847,400	12,907,256
1919.....	318,900	5,610,000	.....	10,668,100	.....	2,246,700	18,797,600
1920.....	1,928,839	27,694,449	.....	13,134,755	.....	1,007,600	43,766,543
1921.....	4,376,450	.....	.....	12,706,213	.....	1,286,005	18,378,668
1922.....	1,569,530	.....	.....	17,218,000	.....	790,870	19,617,400
1923.....	826,420	5,601,420	.....	17,622,610	.....	504,172	24,754,622
1924.....	313,519	3,640,000	.....	9,720,231	.....	480,640	14,124,390
1925.....	172,279	9,773,469	16,023,401	308,300	26,276,439
1926.....	458,700	1,131,000	19,209,600	624,560	21,426,560

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YEARLY COMPARATIVE TABLE OF FRY PLANTED FROM THE STATE HATCHERIES—Continued.

DISTRICT AND YEAR	Chinook	Dog	Humpback	Silver	Sockeye	Steelhead	Totals
WILLAPA HARBOR DISTRICT—							
1913	3,247,345	1,551,750	.....	1,659,765	.....	248,555	5,132,665
1914	3,007,461	500,890	.....	291,400	.....	106,440	2,901,111
1915	2,374,145	500,890	.....	789,250	.....	.....	3,734,285
1916	5,311,735	2,350,895	.....	709,291	.....	.....	10,362,821
1917	1,463,700	2,318,100	.....	1,272,500	.....	771,600	2,541,900
1918	5,458,500	938,400	.....	2,194,800	.....	891,100	12,500,100
1919	201,604	5,613,783	.....	3,898,400	.....	1,240,900	19,321,600
1921	6,023,604	89,168	.....	10,826,800	.....	1,969,900	19,311,600
1922	5,072,780	.....	.....	4,706,300	.....	691,700	9,701,500
1923	3,784,325	.....	.....	8,270,640	.....	1,085,340	12,140,305
1924	6,538,700	205,265	.....	2,320,166	.....	580,355	12,540,415
1925	9,380,450	.....	.....	.....	.....	.....	.....
1926	.....	.....	.....	.....	.....	.....	.....
ALL DISTRICTS COMBINED—							
1913	28,411,893	5,597,178	953,155	9,759,650	49,792	3,598,103	48,369,793
1914	31,593,701	15,674,048	578,504	42,755,182	12,949	3,400,105	84,039,482
1915	45,782,719	34,468,015	2,951,113	35,170,921	912,638	7,410,032	126,695,802
1916	45,782,720	34,468,016	2,951,114	35,170,921	912,637	7,410,032	126,695,813
1917	82,011,474	71,750,001	6,038,256	46,730,153	6,552,070	9,154,068	220,201,023
1918	45,549,106	22,228,025	.....	16,220,087	645,120	6,952,632	81,546,370
1919	22,920,700	22,602,325	1,315,500	27,650,000	.....	8,571,600	98,370,185
1920	8,292,607	114,144,057	718,600	41,320,827	.....	6,292,317	170,809,469
1921	40,957,290	24,671,252	8,475,600	43,843,473	.....	4,795,459	117,713,773
1922	30,322,357	16,314,627	16,314,627	43,843,473	.....	3,522,334	99,448,244
1923	29,046,267	9,655,351	6,880,944	75,815,138	294,800	3,180,791	126,089,479
1924	24,750,314	10,699,574	29,588,675	69,473,210	.....	5,187,160	129,918,933
1925	24,929,007	17,867,454	4,608,715	74,219,698	.....	2,415,312	126,049,186
1926	45,836,164	9,693,405	1,300,000	56,870,622	.....	2,877,750	115,586,941

YEARLY COMPARATIVE TABLE OF EGG TAKE IN STATE SALMON HATCHERIES.

DISTRICT AND YEAR	Chinook	Dog	Humpback	Silver	Sockeye	Steelhead	Totals
PUGET SOUND DISTRICT—							
1900.....	.....	.....	.....	.....	.....	.....	37,673,000
1901.....	.....	.....	.....	.....	.....	.....	45,628,285
1902.....	.....	.....	.....	.....	.....	.....	17,802,140
1903.....	.....	.....	.....	.....	.....	.....	16,485,776
1904.....	2,600,200	2,000,000	.....	11,400,426	290,000	2,386,150	2,887,226
1905.....	5,101,000	14,300,000	.....	25,900,000	.....	3,463,970	50,343,870
1906.....	4,275,000	2,278,350	2,655,000	24,304,000	.....	4,420,375	41,372,077
1907.....	7,858,400	6,018,000	.....	20,961,200	.....	3,681,450	39,343,400
1908.....	9,232,750	7,718,200	510,000	25,310,100	.....	4,853,000	40,807,850
1909.....	10,825,650	13,255,200	.....	35,212,200	.....	5,254,240	51,444,800
1910.....	4,742,350	3,050,500	390,300	33,342,972	.....	5,912,656	48,468,203
1911.....	4,662,775	12,477,000	.....	50,415,100	.....	11,050,000	81,311,350
1912.....	7,000,450	7,462,850	1,000,750	37,017,355	.....	3,462,689	53,472,994
1913.....	4,219,000	11,482,750	.....	33,480,445	.....	4,973,460	55,310,655
1914.....	5,350,000	11,686,158	6,143,000	32,425,087	.....	5,345,652	60,011,179
1915.....	3,207,200	11,686,158	.....	72,425,087	.....	1,296,200	34,160,319
1916.....	3,207,200	17,178,850	6,491,400	6,125,000	.....	5,697,625	33,290,725
1917.....	7,137,050	15,887,400	.....	13,752,650	.....	3,551,830	43,658,800
1918.....	8,368,550	21,734,200	2,285,650	18,496,650	.....	3,764,450	53,221,773
1919.....	6,071,255	30,139,475	.....	53,091,900	.....	3,784,050	70,834,325
1920.....	2,091,100	7,275,600	6,071,500	14,507,750	.....	2,537,690	37,459,155
1921.....	6,187,675	3,114,400	.....	47,735,950	.....	3,450,300	57,001,850
1922.....	3,643,000	7,418,000	7,025,100	51,251,200	.....	4,478,000	76,309,350
1923.....	6,791,356	10,571,350	42,217,100*	39,380,250	.....	1,936,500	128,377,800
1924.....	11,475,000	3,172,000	5,880,750	.....	8,000	.....	61,637,100
1925.....	11,250,000	16,461,300	.....	29,735,683	.....	3,410,550	61,127,532
1926.....	11,469,000	.....	.....	.....	.....	.....	.....
COLUMBIA RIVER DISTRICT—							
1900.....	.....	.....	.....	.....	.....	.....	16,635,000
1901.....	.....	.....	.....	.....	.....	.....	29,431,210
1902.....	.....	.....	.....	.....	.....	.....	17,803,270
1903.....	.....	.....	.....	.....	.....	.....	3,085,000
1904.....	3,500,000	.....	.....	185,000	.....	.....	7,120,000
1905.....	6,470,000	.....	.....	650,000	.....	.....	7,235,000
1906.....	5,175,000	.....	.....	2,050,000	.....	.....	10,040,550
1907.....	9,947,000	.....	.....	972,650	.....	.....	12,788,500
1908.....	7,718,000	.....	.....	1,278,000	.....	.....	9,410,000
1909.....	9,484,500	413,000	.....	3,344,000	.....	.....	13,497,350
1910.....	11,622,500	464,000	.....	1,341,000	.....	.....	19,469,400
1911.....	19,055,400	114,000	.....	320,000	.....	.....	26,250,000
1912.....	24,196,000	115,000	.....	2,015,000	.....	.....	33,705,300
1913.....	31,982,000	687,000	.....	1,036,500	.....	.....	.....

* Humpback eggs taken in Alaska and resultant fry released in Puget Sound.

YEARLY COMPARATIVE TABLE OF EGG TAKE IN STATE SALMON HATCHERIES—Continued.

DISTRICT AND YEAR	Chinook	Dog	Humpback	Silver	Sockeye	Steelhead	Totals
COLUMBIA RIVER DISTRICT—Continued							
1914	20,239,650	1,831,100	.....	1,826,000	.....	.....	23,896,750
1915	44,796,975	737,450	.....	1,247,900	.....	2,839,750	49,592,075
1916	44,796,975	737,450	.....	3,581,000	.....	4,201,500	78,291,550
1917	70,256,550	192,000	.....	1,825,000	.....	3,492,000	44,825,350
1918	38,776,730	221,000	.....	1,385,100	.....	5,379,000	30,469,350
1919	23,432,750	272,500	.....	2,181,500	.....	7,890,900	7,890,900
1920	2,459,000	.....	.....	1,603,500	.....	1,265,000	44,021,855
1921	41,153,355	.....	.....	148,000	.....	.....	29,813,000
1922	20,337,000	547,000	.....	.....	.....	.....	20,814,000
1923	20,869,000	684,000	.....	.....	.....	.....	21,523,000
1924	27,977,000	.....	.....	.....	.....	.....	27,977,000
1925	20,151,250	605,500	.....	454,500	.....	.....	30,211,250
1926	.....	.....	.....	.....	.....	.....	.....
GRAYS HARBOR DISTRICT—							
1909	.....	.....	.....	.....	.....	.....	2,122,000
1910	.....	.....	.....	.....	.....	.....	5,190,000
1911	.....	.....	.....	.....	.....	.....	1,000,000
1912	.....	.....	.....	.....	.....	.....	.....
1913	.....	.....	.....	.....	.....	.....	.....
1914	600,000	1,632,000	.....	2,848,200	.....	.....	5,080,200
1915	406,000	1,000,000	.....	2,500,000	.....	.....	3,906,000
1916	163,000	2,064,000	.....	3,275,000	.....	.....	5,502,000
1917	148,000	1,737,000	.....	1,800,000	.....	.....	3,705,000
1918	403,000	859,000	.....	1,577,000	.....	.....	2,839,000
1919	117,000	1,988,000	.....	4,491,000	.....	.....	6,946,000
1920	125,000	1,132,000	.....	3,973,000	.....	1,250,000	6,946,000
1921	126,000	3,454,000	.....	1,878,000	.....	125,000	5,555,000
1922	156,000	1,180,000	.....	4,119,000	.....	559,000	6,008,000
1923	105,000	14,215,000	.....	6,025,000	.....	820,000	6,275,000
1924	778,000	42,437,600	.....	7,841,900	.....	646,000	21,591,000
1925	610,500	23,442,300	.....	7,841,900	.....	1,069,750	52,137,250
1916	778,000	42,437,600	.....	7,841,900	.....	1,648,000	35,610,900
1917	311,000	4,942,800	.....	14,789,415	.....	2,941,000	21,613,215
1918	363,200	39,296,800	.....	8,181,675	.....	1,970,700	50,783,535
1919	2,451,250	65,569,030	.....	23,774,040	.....	1,635,050	93,774,000
1920	208,000	.....	.....	17,747,100	.....	1,574,000	19,588,150
1921	694,000	.....	.....	9,538,000	.....	1,574,000	11,776,000
1922	879,000	5,859,000	.....	21,191,500	.....	964,000	28,883,500
1923	336,000	5,812,874	.....	20,794,996	.....	1,018,000	25,637,840
1924	186,000	8,418,000	30,739,050	861,000	39,259,050
1925	480,000	1,139,000	32,180,650	1,369,450	35,219,100
1926

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YEARLY COMPARATIVE TABLE OF EGG TAKE IN STATE SALMON HATCHERIES—Continued.

DISTRICT AND YEAR	Chinook	Dog	Humpback	Silver	Sockeye	Steelhead	Totals
WILLAPA HARBOR DISTRICT—							
1900	.....	.....	.....	.....	.....	.....	788,000
1902	.....	.....	.....	.....	.....	.....	4,198,810
1903	.....	.....	.....	.....	.....	.....	1,686,300
1904	700,000	.....	.....	.....	.....	390,000	3,920,000
1905	588,500	.....	.....	2,000,000	.....	180,000	3,178,000
1906	437,400	.....	.....	2,400,000	.....	180,000	3,322,400
1907	678,600	.....	.....	2,540,000	.....	180,000	1,481,600
1908	822,200	.....	.....	504,000	.....	309,000	1,225,200
1909	455,200	.....	.....	604,000	.....	.....	519,200
1910	773,000	.....	.....	2,731,000	.....	400,000	3,904,000
1911	788,000	.....	.....	3,457,500	.....	400,100	4,660,600
1912	788,000	.....	.....	1,540,000	.....	510,000	2,818,000
1913	1,845,500	.....	.....	2,040,000	.....	262,000	3,641,500
1914	437,000	.....	.....	853,500	.....	87,000	1,478,700
1915	1,750,775	.....	.....	807,600	.....	11,250	2,578,625
1916	2,237,800	.....	.....	847,600	.....	11,250	2,978,650
1917	1,608,200	.....	.....	1,151,250	.....	813,800	4,202,850
1918	7,880,200	336,350	.....	2,219,750	.....	285,300	4,449,500
1919	1,016,000	1,016,000	.....	2,182,700	.....	1,831,400	12,080,350
1920	823,000	5,348,500	.....	5,580,800	.....	2,734,750	13,486,100
1921	6,857,900	.....	.....	6,756,500	.....	2,432,600	15,820,300
1922	9,217,000	.....	.....	9,130,000	.....	2,658,000	14,056,000
1923	7,572,900	.....	.....	6,682,000	.....	2,222,000	18,178,900
1924	2,905,000	.....	.....	6,688,000	.....	1,821,000	10,912,000
1925	6,408,600	.....	.....	7,163,500	.....	1,891,000	15,063,100
1926	10,801,100	227,500	.....	8,286,500	.....	762,500	15,077,600
ALL DISTRICTS COMBINED—							
1900	.....	.....	.....	.....	.....	.....	57,156,000
1902	.....	.....	.....	.....	.....	.....	84,518,406
1903	.....	.....	.....	.....	.....	.....	37,822,710
1904	.....	.....	.....	.....	.....	.....	23,190,778
1905	6,800,200	3,632,000	.....	13,585,408	.....	2,715,150	31,986,128
1906	19,750,500	15,300,000	.....	35,787,200	320,000	3,079,426	64,966,270
1907	10,992,300	4,342,350	.....	27,971,202	.....	4,048,975	59,497,127
1908	18,647,600	8,218,000	2,065,900	24,513,200	.....	4,080,450	64,232,500
1909	17,440,950	9,637,500	519,600	30,993,100	.....	4,860,000	66,094,550
1910	17,824,740	14,907,500	.....	36,773,500	.....	6,864,240	75,791,989
1911	24,611,175	15,905,500	.....	41,238,472	.....	6,442,706	77,943,269
1912	32,150,450	16,346,000	390,300	56,948,100	.....	12,119,000	116,468,560
1913	37,732,500	8,919,850	1,680,750	44,116,886	.....	4,874,639	97,084,594

YEARLY COMPARATIVE TABLE OF EGG TAKE IN STATE SALMON HATCHERIES—Concluded.

DISTRICT AND YEAR	Chinook	Dog	Humpback	Silver	Sockeye	Steelhead	Totals
ALL DISTRICTS COMBINED—Continued							
1914.....	26,182,350	27,525,850	.....	42,893,945	13,300	5,708,960	102,277,465
1915.....	50,511,960	54,881,188	6,143,600	42,322,487	1,003,463	9,456,402	164,319,129
1916.....	50,511,960	54,881,188	.....	42,322,487	1,236,200	9,456,403	158,469,269
1917.....	50,542,800	40,813,650	6,491,400	20,463,150	12,646,000	12,360,925	173,325,925
1918.....	49,004,480	21,337,550	.....	32,636,215	1,499,000	8,869,830	113,427,175
1919.....	38,136,685	62,319,600	2,285,060	31,039,125	.....	13,616,560	147,414,010
1920.....	7,925,230	101,357,005	.....	65,465,250	.....	11,178,000	185,925,525
1921.....	54,136,530	7,275,000	6,071,500	41,104,850	.....	7,904,580	116,492,460
1922.....	36,941,600	3,144,400	.....	66,823,950	10,000	6,410,900	113,335,860
1923.....	35,362,250	14,254,600	7,025,100	80,975,700	.....	6,626,300	144,243,950
1924.....	35,583,600	17,538,224	42,217,100	84,694,716	.....	6,817,000	186,650,640
1925.....	45,911,600	11,590,600	5,889,750	67,337,900	8,000	4,188,500	134,923,250
1926.....	51,882,960	18,458,300	.....	65,716,733	.....	5,542,500	141,636,488

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS.
Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
1926— May 11	Joseph Heinker	BENTON COUNTY Illegal possession of fish.	Guilty.	\$10 00	\$10 00
1926— July 23	Louis James	OLALLAM COUNTY Fishing without license.	Guilty.	\$50 00	
July 26	L. Hyde	Fishing without license.	Guilty.	20 00	
July 26	W. Menson	Fishing without license.	Guilty.	20 00	
July 26	Harry Sampson	Fishing without license.	Guilty.	50 00	
July 29	T. N. Alstad	Fishing without license.	Guilty.	20 00	
July 29	H. Czalkon	Alien fishing without license.	Guilty.	20 00	
July 29	A. Chadwick	Fishing without license.	Guilty.	20 00	
July 29	William Grig	Fishing without license.	Guilty.	20 00	
July 29	George Beale	Fishing within 3 miles of Hoko River.	Guilty.	20 00	
Oct. 24	Jack Beale	Assisting in operating drag seine within 3 miles of mouth of Hoko River without license.	Guilty.	25 00	
Oct. 24	H. St. Claire	Assisting in operating drag seine within 3 miles of mouth of Hoko River without license.	Guilty.	25 00	
Oct. 24	Grover Colby	Assisting in operating drag seine within 3 miles of mouth of Hoko River without license.	Guilty.	25 00	
Oct. 24	Mack Colby	Assisting in operating drag seine within 3 miles of mouth of Hoko River without license.	Guilty.	25 00	
Oct. 24	Norman Green	Fishing within three miles of mouth of Hoko River.	Guilty.	25 00	
Oct. 24	Ed Haight	Fishing within three miles of mouth of Hoko River.	Guilty.	25 00	
Oct. 24	Thomas Parker	Fishing within three miles of mouth of Hoko River.	Guilty.	25 00	
Oct. 24	William Penn	Assisting in operating drag seine within 3 miles of mouth of Hoko River without license.	Guilty.	25 00	
Oct. 24	John Smith, Jr.	Fishing within three miles of mouth of Hoko River.	Guilty.	25 00	
Oct. 24	Charles E. Morris	Operating small gear smelt net for salmon.	Guilty.	25 00	
Oct. 26	George Morris	Operating small gear smelt net for salmon.	Guilty.	75 00	
Oct. 30	C. Carlson	Digging claims for sale without license.	Guilty.	5 00	
Oct. 30	Mat Thompson	Digging claims for sale without license.	Guilty.	5 00	
Oct. 31	O. M. Baakkevar	Digging claims for sale without license.	Guilty.	5 00	
Oct. 31	Carl Blank	Digging claims for sale without license.	Guilty.	5 00	
Oct. 31	Knut Bull	Digging claims for sale without license.	Dismissed.		
Oct. 31	H. S. Clark	Digging claims for sale without license.	Guilty.	5 00	
Oct. 31	Ed Engram	Digging claims for sale without license.	Guilty.	5 00	
Oct. 31	H. Hanson	Digging claims for sale without license.	Dismissed.		
Oct. 31	C. Holm	Digging claims for sale without license.	Guilty.	5 00	
Oct. 31	M. Hopkins	Digging claims for sale without license.	Guilty.	5 00	
Oct. 31	O. Lambert	Digging claims for sale without license.	Guilty.	5 00	

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
1924—		CLALLAM COUNTY—Concluded			
Oct. 31	A. M. Larsen.....	Digging clams for sale without license.	Dismissed.....		
Oct. 31	Tony Mathews.....	Digging clams for sale without license.	Guilty.....	\$5 00	
Oct. 31	J. P. Mil.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	W. C. Mitchell.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	A. Nason.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	Chris Nolson.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	Charles Nolson.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	Fred Oshourne.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	B. Reyes.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	F. Reyes.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	Charles Stone.....	Digging clams for sale without license.	Guilty.....	5 00	
Oct. 31	S. Tenoverly.....	Digging clams for sale without license.	Guilty.....	5 00	
Nov. 4	J. R. Hall.....	Selling crabs without license.	Guilty.....	5 00	
Nov. 4	Wallace Hall.....	Selling crabs without license.	Guilty.....	5 00	
Nov. 16	Ida White.....	Selling fish without license.	Dismissed.....		
Nov. 20	Timothy Bruis.....	Shooting and gaffing salmon.	Dismissed.....		
Nov. 20	Robt. McIntyre.....	Shooting and gaffing salmon.	Dismissed.....		
Nov. 22	J. F. Calkin.....	Fishing in closed waters.	Dismissed.....		
Nov. 22	David Hudson.....	Fishing in closed waters.	Dismissed.....		
1927—					
Feb. 12	Cecil Johannes.....	Selling salmon illegally.	Dismissed.....		\$730 00
1926—		CLARK COUNTY			
Sept. 8	John Williams.....	Possession and sale of salmon during closed season.	Guilty.....	\$50 00	
Sept. 8	Richard Weiss.....	Possession and sale of salmon during closed season.	Guilty.....	50 00	
1927—					
Mar. 27	Albert Beebe.....	Fishing set nets during closed season.	Guilty.....	25 00	
Mar. 27	Frank Beebe.....	Fishing set nets during closed season.	Guilty.....	25 00	\$150 00
1926—		OOWLITZ COUNTY			
May 28	B. F. Foreman, A. N. Hookins and L. O. Hagerman.....	Operating retail market without license.	No fine.....		
1927—					
Mar. 27	R. A. Morriison.....	Salmon in possession for sale during closed season.	Guilty.....	\$75 00	\$75 00

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
GRAYS HARBOR COUNTY					
1925—					
April 14	Gust Johnson	Digging clams without license.	Gulley	\$25 00	
July 12	S. Benson	Casting sawdust in the water.	Gulley	5 06	
Sept. 1	W. G. Hulet	Sawing logs in Chehalis River.	Gulley	10 00	
Sept. 3	W. S. McKay	Peddling fish without license.	Gulley	7 25	
Sept. 5	Rockwell's Cafe	Serving fresh razor clams out of season.	Dismissed		
Oct. 16	E. E. Jamison	Fishing during closed season.	Gulley	25 00	
Oct. 17	J. Mateljien	Fishing without license.	Gulley	25 00	
Oct. 17	Oscar Tonnuson	Fishing with gill net one-third across river.	Gulley	25 00	
Nov. 8	Geo. Bagley	Gaffing salmon	Gulley	25 00	
Nov. 8	Lloyd Goodpaster	Fishing in closed waters.	Gulley	10 00	
Nov. 9	Charley Johnson	Alien fishing on pound nets	Gulley	10 00	
Nov. 9	Charles Olson	Alien fishing	Gulley	10 00	
Nov. 9	S. Rasmussen	Alien working on pound nets	Gulley	10 00	
Nov. 9	Ted Skaret	Alien fishing	Gulley	10 00	
Nov. 9	Carl Sodersten	Alien fishing	Gulley	10 00	
Nov. 9	Carl Swanson	Alien fishing	Gulley	10 00	
Nov. 15	Geo. Swanson	Fishing two traps without license.	Gulley	100 00	
1927—					
Jan. 20	Fred Williams	Fishing with set net in closed waters.	Gulley	50 00	
Feb. 22	C. E. Johnson	Smoking and selling salmon without license.	Gulley	5 00	
Mar. 1	A. August	Selling clams at retail during closed season.	Gulley	21 25	
Mar. 1	N. L. Whitmer	Selling clams at retail during closed season.	Gulley	11 25	\$419 80
ISLAND COUNTY					
1926—					
July 3	Chas. Hansen	Fishing during closed season.	Gulley	Dismissed	
Oct. 1	Wm. Anderson	Fishing in closed area	Pending		
Oct. 1	F. Gillis	Fishing in closed area.	Pending		
Oct. 1	A. Haugland	Fishing in closed area.	Pending		
Oct. 1	R. McDonald	Fishing in closed area.	Pending		
Oct. 1	Thos. Steele	Fishing in closed area.	Pending		
Oct. 1	Sam Watland	Fishing in closed area.	Pending		
Oct. 2	A. J. Anderson	Fishing in salmon preserve with purse seine.	Pending		
Oct. 5	Frank Davis	Fishing in salmon preserve with purse seine.	Pending		
Oct. 5	Ole Hendrickson	Fishing in salmon preserve with purse seine.	Pending		

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
1925—		ISLAND COUNTY—Concluded			
Oct. 5	Jack Hesse	Fishing in salmon preserve with purse seine.	Pending		
Oct. 5	Minor Johnson	Fishing in salmon preserve with purse seine.	Pending		
Oct. 5	Minor Johnson	Allen engaged in fishing.	Pending		
1926—		JEFFERSON COUNTY			
Nov. 8	Ernest Obi and Tyler Hoebusket.	Fishing set net above dead line.	Guilty	\$10 00	\$10 00
1926—		KING COUNTY			
May 19	Dressel-Collins	Illegal possession of clams.	Guilty	\$17 25	
Aug. 16	James O. Jackson	Operating drag seine without license.	Guilty	25 00	
Aug. 16	C. W. Wagner	Operating drag seine without license.	Guilty	25 00	
Aug. 29	Alfred Hoffer	Using set net in Green River	Dismissed		
Sept. 29	Joe Bill	Using set net in Green River	Dismissed		
Sept. 29	Frank Lazler	Using set net in Green River	Dismissed		
Oct. 10	Lake Union Dry Dock Co.	Polluting waters of Lake Union.	Guilty	15 00	
Nov. 23	Jim John	Selling fish without license.	Guilty	5 00	
Nov. 28	D. Jerry	Spearing salmon	Suspended		
Nov. 28	Jim Moses	Spearing salmon	Suspended		
Dec. 9	John Doe Bush.	fishing without license.	Escaped		
Dec. 9	S. Darling	fishing without license.	Escaped		
Dec. 12	John Lekich	Allen engaged in fishing	Escaped		
Dec. 27	Martin Perry	Fishing without license.	Guilty	20 00	
Dec. 27	R. McDougall	Operating drag seine without license.	Guilty	75 00	
Dec. 30	H. Hasbiguchl	Retailing fish without license.	Guilty	10 00	
1927—					
Jan. 25	Denny Kourkoumeles	Operating set net in closed waters.	Guilty	75 00	
Jan. 28	K. Kanazawa	Catching and selling salmon illegally	Guilty	15 00*	
Feb. 25	S. L. Anderson (Pioneer Market)	Retailing fish without license.	Guilty	10 00	
Feb. 25	R. G. DeVroker (Bosch A. 1 Mkt.)	Retailing fish without license.	Guilty	10 00	
Feb. 25	R. J. Deser (Pac. Highway Mkt.)	Retailing fish without license.	Guilty	10 00	
Feb. 25	W. A. Hutchison (Good Mkt.)	Retailing fish without license.	Guilty	10 00	
Feb. 25	W. H. Sunyth (Mt. View Mkt.)	Retailing fish without license.	Guilty	10 00	
Feb. 25	O. H. Trye (Harvard Mkt.)	Retailing fish without license.	Guilty	10 00	
					\$417 25

* Ball forfeited.

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.

Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
1925—		KITSAP COUNTY			
April 5	John Adams	Using 50 more feet of net than covered by license.	Guilty	\$25 00	
July 9	Fred W. Seltorgren	Selling food fish at retail without license.	Guilty	20 00	
Sept. 22	Al Johnson	Dumping sawdust and mill waste in water.	Guilty	21 75	
Oct. 18	D. F. McDonald	Gaffing salmon.	Guilty	20 00	
Nov. 4	Joe Brown	Possession of illegal salmon.	Guilty	25 00	
Nov. 4	Clarence Donley	Fishing without license.	Guilty	25 00	
Nov. 11	Ben Garrison	Fishing in closed waters.	Guilty	250 00	
Nov. 11	W. Johnson	Fishing in closed waters.	Guilty	250 00	
Nov. 23	August Berg	Casting sawdust in water.	Guilty	25 00	
1927—					\$276 75
Feb. 26	Gus Kechin	Retailing fish without license.	Guilty	15 00	
1925—		KLIKITAT COUNTY			
June 25	John F. Albright	Operating gill net without license.	Guilty	\$25 00	
June 25	Kenneth Fisher	Operating as a boat puller without license.	Guilty	5 00	
July 2	Ole Charlie	Operating Chinese sturgeon lines.	Guilty	50 00	\$80 00
1925—		LEWIS COUNTY			
Aug. 2	R. Wiesner	Unlawfully taking fish from traps.	Guilty	\$7 50	\$7 50
Dec. 14	John D. Sanders	Illegal sale of fish.	Dismissed		
1925—		MASON COUNTY			
Aug. 25	Fred Iamorsh	Gaffing salmon	Guilty	\$10 00	
Sept. 13	Fred Budding	Gaffing salmon	Guilty	10 00	
Sept. 13	Jack Graves	Gaffing salmon	Guilty	10 00	
Sept. 13	C. J. Swarts	Gaffing salmon	Guilty	10 00	
Sept. 26	C. H. Baer	Gaffing salmon	Guilty	8 00	
Sept. 26	E. T. Darling	Gaffing salmon	Guilty	8 00	
Sept. 29	W. G. Overby	Gaffing salmon	Guilty	10 00	
Oct. 15	Leo Johnson	Gaffing salmon	Guilty	15 00	
Oct. 15	Ed. Rhodes	Gaffing salmon	Guilty	15 00	
Oct. 15	E. R. Rowe	Gaffing salmon	Guilty	15 00	
Oct. 21	Alton Pagett	Gaffing salmon	Guilty	10 00	

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.

Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
MASON COUNTY—Concluded					
1926— Oct. 21	Chas. Teahell	Gaffing salmon	Gulley	\$10 00	
Oct. 21	Earl Tephel	Gaffing salmon	Gulley	10 00	
Oct. 24	J. M. Curdls	Gaffing salmon	Gulley	8 00	
Oct. 24	Andy Stacy	Gaffing salmon	Gulley	8 00	
Oct. 24	John Matson	Gaffing salmon	Gulley	10 00	
Oct. 24	Henry Matson	Gaffing salmon	Gulley	8 00	
Nov. 4	Walter Holcombe	Gaffing salmon	Gulley	10 00	
Nov. 4	John Hutson	Gaffing salmon	Gulley	10 00	
Nov. 4	Henry Turner	Gaffing salmon	Gulley	10 00	
Dec. 5	Fred Muste	Shooting salmon	Gulley	10 00	
1927— Feb. 3	C. A. Fryberg	Polluting waters	Gulley	10 00	\$225 00
PACIFIC COUNTY					
1926— April 9	Iwaco Meat Market	Retailing fish without license.	Gulley	\$10 00	
April 12	O. A. Brown	Selling clams without license.	Gulley	10 00	
June 21	Ernest Wilson	Illegal sale of crabs.	Gulley	5 00	
June 25	D. Catalno	Fishing with razor clams for bait during closed season.	Gulley	75 00	
June 25	David Frank	Catching crabs for market without license.	Gulley	75 00	
June 25	Harry Olson	Digging and using clams for crab bait without license.	Gulley	100 00	
June 25	Harry Shipman	Using clams out of season for crab bait and without license.	Gulley	50 00	
Aug. 2	Steve Kukura and crew of 7 men.	Fishing within 3 mile limit above North Head.	Dismissed		
Aug. 6	P. S. boat "Pres. Coolidge"	Selling clams out of season.	Gulley	50 00	
Sep. 6	Carl Smart	Retailing fish without license.	Gulley	25 00	
Nov. 13	Joe Rose	Fishing with set net without license.	Gulley	100 00	
Nov. 14	Joe Alger	Alien fishing on Willapa River.	Gulley	100 00	
Nov. 14	Gust Dist	Fishing without license.	Gulley	50 00	
Nov. 15	Hans Alvenses	Fishing in closed waters.	Gulley	15 00	
Nov. 15	Wm. LaPoint	Fishing without license.	Gulley	15 00	
Nov. 15	Einer Michelson	Selling clams without license.	Gulley	40 00	\$720 00
1927— Mar. 4	Day Simmons				

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
PIERCE COUNTY					
1925— May 19	Marco Radanich	Fishing without license and with underize web.	Guilty	\$100 00*	
June 3	S. G. Onuma	Selling fish without license.	Guilty	10 00	
June 11	Emil Meyer	Fishing without license.	Guilty	10 00	
June 19	John P. Johnson	Fishing illegally with set line.	Guilty	10 00	
June 24	Jack Blaskovich	Spearing sole at Ft. Belknap.	Guilty	10 00	
June 24	A. Webber	Possession of fish without license.	Guilty	25 00	
July 22	Stanley Mckeovoid	Fishing without license and with illegal gear.	Guilty	25 00	
July 22	Ross Lange	Fishing without license and with illegal gear.	Guilty	75 00	
July 22	R. E. Savidge	Fishing without license and with illegal gear.	Guilty	25 00	
Nov 16	K. H. Kawata	Possession of illegally caught fish.	Guilty	15 00	
Nov 16	M. Nakamura	Possession of illegally caught fish.	Guilty	22 50*	
Nov 16	Pacific Fish Co., Inc.	Possession of illegally caught fish.	Guilty	25 00	
Dec. 8	John Adams	Taking salmon in closed waters.	Not guilty		
Dec. 8	Arnold Wendt	Spearing salmon	Guilty	2 50	
Dec. 8	Matt Bratton	Spearing salmon	Guilty	15 00	
Dec. 10	Crystal Palace Mkt. (J. P. Verone)	Selling fish without license.	Guilty	25 00	
Dec. 10	Arnold Iseler	Selling fish without license.	Guilty	10 00	
Dec. 10	E. Messner (Messner Meat Mkt.)	Selling fish without license.	Guilty	10 00	
Dec. 10	Pioneer Mkt. (E. Brown)	Selling fish without license.	Guilty	5 00	
Dec. 10	Settlers Cash Mkt. (H. A. Settlers)	Selling fish without license.	Guilty	10 00	
Dec. 26	G. O. Hirockigt	Killing salmon illegally	Guilty	25 00	
Dec. 27	K. Nakashima	Killing salmon illegally	Guilty	10 00	
Dec. 28	K. Sawada	Killing salmon illegally	Guilty	10 00	
Dec. 28	H. Tajiiri	Killing salmon illegally	Guilty	10 00	
Nov.	John Doerroy DeLong	Gaffing salmon, Minter creek.	Guilty	10 00	
Nov.	M. J. Pike	Gaffing salmon, Minter creek.	Guilty	10 00	\$630 00
SKAGIT COUNTY					
1925— May 13	Glenn Rice	Fishing with gill net without license.	Guilty	\$22 50	
May 14	John Seaborg	Fishing with gill net without license.	Guilty	22 50	
May 15	E. E. Fisher	Fishing with gill net without license.	Guilty	22 50	
May 24	Bert Schelde	Failure to have license number on boat.	Guilty	5 00	
June 24	Marius Dugan	Alien trap watchman.	Guilty	5 00	
Aug. 21	Fred Cook	Fishing during closed season.	Guilty	50 00*	
Aug. 31	Joseph To	Fishing without license.	Guilty	50 00*	
Oct. 16	L. H. Miller	Fishing during weekly closed season.	Guilty	10 00	

* Bail forfeited.

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.

Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
SKAGIT COUNTY—Concluded					
1926— Oct. 7	Frank Bozanich	Fishing in salmon preserve with purse seine.	Pending.		
Oct. 7	Frank Elch	Fishing in salmon preserve with purse seine.	Pending.		
Oct. 7	Mike Francis	Fishing in salmon preserve with purse seine.	Pending.		
Oct. 17	Leslie Hill	Fishing during weekly closed season.	Dismissed.		
Oct. 17	E. Kasech	Fishing trap during weekly closed season.	Dismissed.		
Oct. 17	M. Pardis	Fishing in salmon preserve with purse seine.	Pending.		
Oct. 7	Martin Sulch	Fishing in salmon preserve with purse seine.	Pending.		
Oct. 7	A. Sulch	Fishing in salmon preserve with purse seine.	Pending.		
Oct. 7	Martin Sulch, Sr.	Fishing in salmon preserve with purse seine.	Pending.		
Oct. 7	Joe Zankich	Fishing in salmon preserve with purse seine.	Pending.		
1927— Feb. 2	Northern Fish Co. (H. Peters)	Retailing fish without license.	Guilty.	\$25 00	
Feb. 11	Marco Barcott	Possession and sale of short crabs.	Guilty.	10 00	
Feb. 11	John Curry	Possession and sale of short crabs.	Guilty.	10 00	
Feb. 11	Joe Matlicich	Possession and sale of short crabs.	Guilty.	10 00	
Feb. 11	J. Stankus	Possession and sale of short crabs.	Guilty.	10 00	\$252 50
SNOHOMISH COUNTY					
1926— May 13	John H. Nelson	Fishing without license.	Guilty.	\$15 00	
June 9	C. J. Kirkbus (Everett Fish Co.)	Possession and shipment of short salmon.	Guilty.	25 00	
July 8	A. Christensen	Peddling fish without license.	Guilty.	15 00	
Sept. 10	Anton Bozanich	Fishing during closed season.	Guilty.	10 00	
Sept. 10	Nicholas J. Bozanich	Fishing during closed season.	Guilty.	10 00	
Sept. 10	Harry Crowley	Fishing during closed season.	Guilty.	10 00	
Sept. 11	Vinc Rogdanovich	Fishing during weekly closed season.	Guilty.	200 00	
Sept. 11	Jack Jonech	Fishing during closed season.	Guilty.	10 00	
Sept. 11	Philip Zuanich	Fishing during closed season.	Guilty.	10 00	
Sept. 11	A. V. Zuanich	Fishing during closed season.	Guilty.	10 00	
Sept. 21	Ralph Culver	Fishing in Snohomish Preserve.	Guilty.	10 00	
Sept. 21	Floyd Green	Fishing in Snohomish Preserve.	Guilty.	25 00	
Sept. 21	Leander Johnson	Fishing in Snohomish Preserve.	Guilty.	50 00	
Oct. 8	W. Eggeston	Fishing during closed season.	Guilty.	25 00	
Oct. 11	C. H. Robinson	Fishing above dead line.	Dismissed.		
Oct. 13	Jim Lewis	Fishing above dead line.	Guilty.	25 00	

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.

Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
1925—					
Oct. 14	E. T. Elliott	Fishing in closed waters	Guilty	\$25 00	
Oct. 14	Frank Bean	Fishing in closed area with gill net	Not guilty		
Oct. 30	Nichols Bozantich	Fishing during closed season	Guilty	25 00	
Oct. 30	Nichols Bozantich	Fishing during closed season	Guilty	50 00	
Nov. 3	Ellis Bjorklund	Fishing for crabs without license	Guilty	5 00	
Nov. 3	H. Bjorklund	Fishing for crabs without license	Guilty	5 00	
Dec. 16	T. D. Blankenship	Buying and selling fish without license	Guilty	25 00*	
Dec. 18	Sheridan Ward	Fishing in closed area during closed season	Guilty	25 00	\$40 00
1926—					
June 17	Joe Zamberlain (Olympia Pkng.)	Setting dams out of season	Guilty	\$5 00	
Sept. 17	R. S. Rogers	Selling fish without license	Guilty	5 00	
Oct. 27	Allis Vyer	Galling salmon	Guilty	8 75	
Oct. 27	A. McConkey	Galling salmon	Guilty	8 75	\$27 50
1926—					
April 22	J. P. Drangich	Fishing in herring preserve	Guilty	\$20 00	
Aug. 12	Frank Vidajic	Alma engaged in fishing	Not guilty		
Aug. 12	Frank Vidajic	Alma engaged in fishing	Not guilty		
Aug. 12	Mat Lovovich	Alma engaged in fishing	Not guilty		
Aug. 12	Nick Tovich	Alma engaged in fishing	Not guilty		
Aug. 12	A. W. Baker	Selling fish without license	Guilty	25 00	
Aug. 12	Mat Vulich	Alma engaged in fishing	Dismissed		
Oct. 21	Alvin Mann	Fishing in closed waters	Guilty	50 00	
Oct. 24	Mat Anderson	Fishing in closed waters	Guilty	50 00	
Oct. 24	Nick Bogatch	Fishing in closed waters	Guilty	50 00	
Oct. 24	Nick Bogatch	Fishing in closed waters	Guilty	50 00	
Oct. 24	John Cilkovich	Fishing in closed waters	Guilty	50 00	
Oct. 24	John Elich	Fishing in closed waters	Guilty	50 00	
Oct. 24	Dean Kink	Fishing in closed waters	Guilty	100 00	
Oct. 24	Toon Kinkusich	Fishing in closed waters	Guilty	50 00	
Oct. 24	Marion Kullis	Fishing in closed waters	Guilty	50 00	
Oct. 24	John Mardovich	Fishing in closed waters	Guilty	50 00	
Oct. 24	Nick Rapsnich	Fishing in closed waters	Guilty	50 00	
Oct. 24	Loze Roper	Fishing in closed waters	Guilty	50 00	

* Bail forfeited.

ARRESTS MADE FOR VIOLATION OF THE FOOD FISH LAWS—Continued.
Fiscal Year 1926.

Date of Arrest	OFFENDER	CHARGE	Disposition of Case	Penalty Imposed	Totals
1926—		WHATCOM COUNTY—Concluded			
Oct. 24	Nikola Vitaljic	Fishing in closed waters.	Guilty.	\$100 00	
Oct. 29	John Bakotich	Fishing in closed waters.	Dismissed.		
Oct. 29	John Medak	Fishing in closed waters.	Guilty.	50 00	
Oct. 29	G. L. Peplica	Fishing in closed waters.	Guilty.	50 00	
Oct. 29	Jack Vitaljic	Fishing in closed waters.	Guilty.	50 00	
Oct. 29	A. G. Smith	Fishing in closed waters.	Guilty.	50 00	
Oct. 29	John Rudan	Fishing in closed waters.	Guilty.	50 00	
Oct. 29	Niek Vitalich	Fishing in closed waters.	Guilty.	150 00	
Oct. 30	John Evich	Fishing in closed waters.	Guilty.	100 00	
Oct. 30	Michel Evich	Fishing in closed waters.	Guilty.	100 00	
Oct. 30	John Medak	Fishing in closed waters.	Guilty.	150 00	
Oct. 30	Dome Moskovita	Fishing in closed waters.	Guilty.	100 00	
Oct. 30	George Paqich	Fishing in closed waters.	Guilty.	100 00	
Oct. 30	John Padovan	Fishing in closed waters.	Guilty.	100 00	
Oct. 30	Anton Surjan	Fishing in closed waters.	Guilty.	100 00	
1927—					
Mar. 12	Edgar Erickson	Fishing for smelt during weekly closed season.	Guilty.	30 00	\$2,025 00
Mar. 30	Tom A. Tom.	Possessor of fish out of season.	Not guilty.		
		WAHIAKUM COUNTY			
1926—					
Sept. 10	Stuart Davis	Fishing trap during closed season.	Guilty.	\$50 00	
Sept. 10	Stuart Davis	Fishing trap during closed season.	Guilty.	50 00	
Sept. 10	Stuart Davis	Fishing trap during closed season.	Guilty.	50 00	
Oct. 27	O. C. Arness	Possession of small salmon.	Guilty.	12 50	
Feb. 11	Kenneth Backman	Fishing without license.	Guilty.	15 00	\$177 50
	GRAND TOTAL				\$7,133 80

Note.—The total amount of fines shown above is very seldom equaled by the actual cash returns shown in the reports of the State Treasurer. Quite often fines are worked out by jail sentences. Justices often permit partial payments or through error the fines get into county game funds, and the making of adjustments sometimes requires a long period of time.(C. R. F.)

FISHWAYS REPAIRED, INSTALLED OR ORDERED INSTALLED.**Fiscal Year 1925-1926**

OWNER OF DAM	STREAM LOCATED ON	COUNTY	CONDITION
PUGET SOUND DISTRICT— Puget Sound Power & Light Co.....	Baker River.....	Skagit.....	Incomplete

NUMBER AND VALUE OF CANNERIES AND FACTORIES OPERATED, AND THEIR FISHING APPLIANCES, AND CAPITAL INVESTMENTS, INCLUDING PLANTS OPERATED BY WHOLESALE DEALERS AND PROCESSORS.

Fiscal Year 1926.

	PUGET SOUND DISTRICT		COLUMBIA RIVER DISTRICT		GRAYS HARBOR DISTRICT		WILLAPA HARBOR DISTRICT		ALL DISTRICTS COMBINED	
	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value
Canneries, salmon (buildings and machinery).....	14	\$834,040 60	8	\$498,850 50	4	\$41,821 39	2	\$36,000 00	28	\$1,410,721 67
Canneries other than salmon.....	4	33,534 00			15	140,520 97	0	44,625 08	28	218,740 74
Factories by-products.....	2	28,000 00							2	28,000 00
Warehouses, cold storages, smoke houses, packing plants, fuel houses, residences for labor, real estate, automobiles, trucks and other land conveyances.....	47	1,727,633 03		189,088 02		31,986 74		4,410 53		1,953,118 92
Steamboats.....	7	34,625 28	6	7,255 00	21	8,268 25	6	950 00	90	50,908 53
Launches.....	24	243,800 24			2	400 00			7	243,800 24
Pile drivers or pullers.....	14	107,500 22	10	22,311 31			1	900 00	37	131,082 10
Saws.....	103	80,330 10	15	15,555 00	3	3,064 00	2	4,500 00	19	113,275 30
Cannery tenders.....	17	227,625 19	4	31,925 44	2	5,100 00	3	600 00	124	268,140 60
Fishing boats.....	24	59,153 75	68	90,225 40	10	1,500 00	3	750 00	223	208,740 57
Buyer's boats.....	1	7,008 50	5	4,200 00					6	11,803 80
Found net locations, operated.....	60	687,756 38	19	13,242 13			12	15,000 00	91	715,998 71
Found net locations, not operated.....			13	9,300 00			4	4,000 00	60	52,301 00
Stationary or scow fish wheels.....			7	19,720 00	6	625 00		300 00	7	19,720 00
Nets and seines.....		2,000 00	35	42,093 87	8	92 00		100 00	152	147,046 96
Net ricks.....							1	2,897 75	44	44,223 87
Miscellaneous equipment.....		94,534 04		2,568 01		7,258 25				107,038 66
Total invested in plant and equipment		\$4,310,700 48		\$1,095,944 96		\$240,436 60		\$115,003 36		\$5,762,085 40
Operating expenses.....		5,660,047 78		1,776,597 08		521,099 94		173,075 43		8,131,220 83
Grand total capital invested.....		\$9,970,748 26		\$2,872,542 04		\$761,536 54		\$288,078 79		\$13,856,306 23

Note—The above figures do not include valuations of the floating gear and equipment or the fixed appliances owned and operated independent of the operators whose reports make up the above statement.

NUMBER AND EARNINGS OF LABORERS EMPLOYED IN OPERATION OF CANNERIES, FACTORIES, WHOLESALE AND PROCESSING PLANTS AND THEIR APPLIANCES.

Fiscal Year 1926.

	PUGET SOUND DISTRICT			COLUMBIA RIVER DISTRICT			GRAYS HARBOR DISTRICT		
	Number Em- ployed	Average Season's Earnings	Total Earnings	Number Em- ployed	Average Season's Earnings	Total Earnings	Number Em- ployed	Average Season's Earnings	Total Earnings
Clerical Capacity—									
Male	109	\$2,107 58	\$229,723 88	20	\$2,136 37	\$42,727 32	12	\$311 73	\$6,740 73
Female	31	2,201 68	68,252 00	3	925 00	2,775 00	5	636 00	3,480 00
Operating canneries, factories, warehouses, etc.—									
White labor—male	648	721 77	467,706 20	117	1,047 12	117,853 31	213	212 86	45,339 39
White labor—female	373	138 46	51,644 81	54	184 29	9,951 73	268	75 28	20,174 81
Oriental labor	216	643 52	139,001 13	165	619 81	102,238 04	25	207 76	5,183 89
Indian labor	22	386 36	8,500 00	.....	.....	.....	14	127 28	1,781 77
Operating pile drivers, pullers, hosts, scoops, nets and other fishing appliances.	481	581 94	279,911 70	107	524 86	56,159 79	4	244 61	978 45
Miscellaneous labor	45	1,478 98	66,554 25	18	1,600 61	28,810 91	498	39 67	19,353 98
Totals.....	1,925	\$681 19	\$1,311,296 77	484	\$744 89	\$360,526 09	1,029	\$103 06	\$106,046 51

NUMBER AND EARNINGS OF LABORERS EMPLOYED IN OPERATION OF CANNERIES, FACTORIES, FACTORIES, WHOLESALERS AND PROCESSING PLANTS AND THEIR APPLIANCES—Concluded.

Fiscal Year 1926.

	WILLIAPA HARBOR DISTRICT			ALL DISTRICTS COMBINED		
	Number Em- ployed	Average Season's Earnings	Total Earnings	Number Em- ployed	Average Season's Earnings	Total Earnings
Clerical Capacity—						
Male	6	\$1,619 81	\$9,719 85	147	\$1,985 81	\$291,018 73
Female	2	407 50	815 00	41	1,837 12	75,322 00
Operating canneries, factories, warehouses, etc.—						
White labor—male	56	248 18	13,907 88	1,024	623 55	644,777 28
White labor—female	90	73 45	6,610 77	785	113 59	89,381 02
Oriental labor	14	142 86	2,000 00	470	501 58	248,493 05
Indian labor	12	282 32	3,400 00	38	285 80	10,281 77
Operating pile drivers, pullers, boats, scows, nets and other fishing appliances	228	83 97	19,304 26	694	582 68	940,449 08
Miscellaneous labor				779	168 06	127,025 40
Totals	408	\$119 48	\$48,746 70	3,846	\$474 94	\$1,826,616 13

OUTPUT OF THE PRIVATE FISH HATCHERIES.

Fiscal Year 1926.

Spawn sold	897,300	Dealers' purchases of hatchery fish from outside the state.....	4,792 pounds
Fry sold	673,754	Dealers' purchases of hatchery fish from inside the state.....	3,732 pounds
Fish sold	138,795	Purchases of hatchery fish by Washington restaurants.....	1,973 pounds

Due to the provisions in the Game Code enacted during the last session of the legislature, the State Game Department will license all fish hatcheries maintained for the hatching and rearing of all kinds of game fish. This department then would only license hatcheries which handle salmon. C.R.F.

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