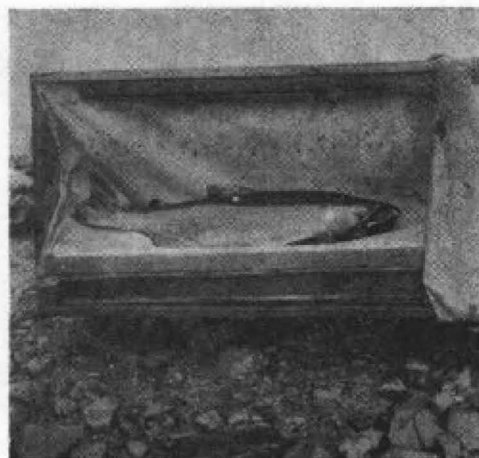


BIENNIAL REPORT OF THE
FISH COMMISSION
OF THE STATE OF OREGON
1949



SALMON TAGGING ON THE COLUMBIA RIVER

BIENNIAL REPORT
OF THE
FISH COMMISSION
OF THE STATE OF OREGON
TO THE
GOVERNOR AND THE FORTY-FIFTH
LEGISLATIVE ASSEMBLY
1949



FISH COMMISSION OF THE STATE OF OREGON

Hon. John C. Veatch, Chairman, Portland

Hon. Robert L. Jones, Clifton

Hon. Earl H. Hill, Cushman

Arnie J. Suomela, Master Fish Warden

LETTERS OF TRANSMITTAL

Portland, Oregon, July 1, 1948

**TO HIS EXCELLENCY, the GOVERNOR, and the MEMBERS
of the FORTY-FIFTH LEGISLATIVE ASSEMBLY**

Gentlemen:

Herewith is transmitted the biennial report of the Fish Commission of the State of Oregon for the period from July 1, 1946 to June 30, 1948.

FISH COMMISSION OF THE STATE OF OREGON

John C. Veatch, Chairman.

Portland, Oregon, July 1, 1948

**FISH COMMISSION OF THE STATE OF OREGON,
Portland, Oregon.**

Gentlemen:

In accordance with the provisions of statute, I herewith submit for your consideration the report of the operation of the department together with financial statement for the biennial period July 1, 1946 to June 30, 1948.

Respectfully submitted,

ARNIE J. SUOMELA,

Master Fish Warden.

REPORT OF THE MASTER FISH WARDEN

The activities of the Fish Commission during this biennium are significant in the history of conservation in Oregon. The reorganization of the department, ordered by the 1945 Legislature, was completed, and the first two full seasons under a more centralized form of organization have passed. The 1947 Legislature provided much-needed legislation which has enabled the Commission to inaugurate a part of its comprehensive fisheries conservation program on the fisheries resources of Oregon.

It seems apropos at this time to report on the progress during the past two years and show by factual material the results of the fisheries program so recently inaugurated. It should be remembered that before a sound program can be drawn up and executed, a great deal of data regarding the fisheries must be gathered by experts trained in that field. Citizens conversant with the problems in their particular districts must be contacted and their information added to the technical data. After careful study of the status of the fisheries, the causative agents of any observed decline must be ascertained from the data collected. After these basic steps are taken, then a sound program of fisheries management may be formulated which will take into account all factors affecting the fisheries. Perhaps, in the case of a decline in the salmon runs of a river, obstructions are found which block the successful passage of the salmon to their spawning grounds. Engineers prepare plans for the elimination of the block or provide access in the form of fish-ladders over falls; then hatchery-reared young fish are planted above, and through biological studies the rehabilitation of the particular salmon run in the stream may become a reality.

The management and conservation of fisheries resources, whether they be our great Chinook salmon runs of the numerous rivers of Oregon, or whether they be clams in the bays along the Oregon Coast, or even species of bottom-dwelling fish landed by the great trawl fishery operating off the coast of Oregon, is a complex problem, and not so simple as some would have us believe. How well we can observe all along the Pacific Coast the results of that era wherein nothing was done to determine the causes of declines in the fish populations and restrictions of the recreational and commercial fisheries were considered to be the panacea for the ills of the fisheries. When the harvests of the fisheries were then curtailed, it was usually assumed that no further action need be taken; no further study was needed, the "disease" had been cured. Such action could lead to but one result, a temporary increase in the resource obtained immediately after the curtailment, but in a few years the trend of the fishery continued down. It appears that such methods are now outmoded in Oregon; let us hope that we have become enlightened to the extent that we can realize the need for sound basic studies of all our natural resources, with the realization that conservation must apply to all factors influencing or depressing the survival and growth of the resources under consideration.

What can we learn from the attempts and mistakes of others with regard to the conservation of our resources? Take the salmon fisheries for example; the picture of the world salmon supply is particularly desolate. The continuous decline throughout the world of the various salmon populations is evident in spite of continuous and unrelaxing curtailment of the harvest. What is the reason? An analysis of the history of this great fishery, from its inception down through to its complete commercial extinction in some countries, shows one consistent fact. There have been no thorough studies made of the life of the salmon wherein all factors reducing the numbers of fish were studied and a sound program of conservation inaugurated, based on these studies. This can be done; it must be done with all our food resources if our crowded nation is to provide food for the people inhabiting it. This is the picture, using one fishery, the salmon, as an example. The proper procedures are available; trained men can be obtained, and the maintenance of our fisheries—even the anadromous species which are affected most by civilization—can be ensured by the wise and judicious use of the tools available. The scientific knowledge ob-

tained must form the basis for sound conservation programs designed to turn the tide and ensure the perpetuation of our fisheries.

The Fish Commission has launched such a program, and in the following pages are given brief accounts of our activities, progress and program, to the end that a clear picture will be available of the objectives of this department.

Value of State's Resources

The commercial fisheries of Oregon in 1947 provided a harvest of seventy millions of pounds of food fish, as well as several millions of pounds of salmon, shellfish, smelt and others harvested by the recreational fishermen. The total yield of the food fish resources in Oregon in 1947 closely approached one hundred million pounds, with a wholesale value of close to forty millions of dollars. This is a substantial income. The fisheries of Oregon and its allied industries, such as shipbuilding, selling marine supplies, outfitting and others, play a large part in the economic welfare of the state. Although it may be forecast that with the industrialization of Oregon, the relative importance of the fisheries may decline, as far as comparative incomes from the industry is concerned, it seems probable that the production of fisheries products may be of tremendously greater importance in sustaining the increased population of the State and the Northwest. It is the objective of the Commission—in so far as a sound resource-wide conservation program will permit—to maintain the fish populations at high levels of abundance and to develop new fisheries from the latent resources of the sea contiguous to the shores of Oregon. In this manner the present commercial production of the resource can be sustained and probably substantially increased and still allow for the expected increased use of the resource as a recreational asset for the people.

Conservation Problems of Oregon Fisheries

The basic problems facing the Commission during the past year, and to a large extent facing the Commission during the coming biennium, may be considered to be of three general types.

One of these problems facing all fisheries of the State is the increased demand for fisheries products. The increased demand has caused greater efforts to be expended upon harvesting the resource. With this increased demand from the many sources such as increased commercial fishing, increased recreational fishing, and more efficient boats and fishing gear, it is necessary to determine what effect the harvest is having upon the resource—whether this be salmon, bay clams, crabs, or sole or flounders in the sea.

Increased usage of our fish and shellfish for recreational purposes makes it imperative that we provide a portion of the yield of our resources for the citizens who desire recreation and pleasure in fishing for our salmon, netting for crabs in the bays, or digging for clams along the bays and shores of the coast of Oregon. At the same time, the realization that the majority of citizens gain access to the use of their fisheries resources through commercial channels, makes it necessary to maintain a balance between the commercial harvest and the recreational harvest. This has been a provoking problem in the past; it has divided our conservation-minded people into two camps. These disagreements are fundamentally the result of misunderstanding; if we take the approach of maintaining the resources at maximum productivity and administering for their conservation in an impartial and scientific manner, there will be little need for concern as to who will harvest the fish, recreation-seekers or commercial fishermen.

Civilization, with all its advances, presents another problem in the conservation of our wildlife resources. During recent years—within the past fifty—our varying pursuits of a livelihood have affected the fish populations through changes in the water conditions in our streams. This manifests itself in many ways. We cut down the cover from our hillsides indiscriminately, causing our rivers to fluctuate violently and become unsuited for anadromous fishes; we divert the waters through flumes, drying up the stream beds entirely; our rivers are used for sewers and cesspools, depriving animal life of the minimum oxygen requirement necessary to maintain life. We build dams and obstructions in the rivers, which provide the paths of migration for our salmon runs, and great lakes formed behind the dams provide an entirely different habitat for the fish whose ancestors passed unimpeded up the rivers on their spawning migrations and back down as young to gather and store the vast supply of nutriment found in the sea. In our bays we dredge out portions of the tideflats, which form the habitat for innumerable species of valuable clams; or we dredge channels and dump the dredge material on the tideflats, destroying the natural areas of production of our shellfish. All these uses and abuses have been affecting, and are affecting at ever-increasing rates, the natural resources of Oregon.

Off our shores lie some of the greatest undeveloped resources of our nation. In a sense, the frontier lies to the west, in the Pacific Ocean. This is being realized by industry and governments, both ours and those of foreign states bounding the Pacific. It is essential that we attempt to more completely utilize the fisheries off our coast and develop new fisheries utilizing those stocks not now harvested. This is the third basic problem confronting the Fish Commission.

How must we accomplish these broad objectives and purposes? What have we done to objectively cope with the multiplicity of interests acting towards reducing our fisheries resources? The Commission, through the medium of its technical staff, has begun the task of determining methods for the proper conservation of our resources. During the past two years, intensive studies have been carried out on all important phases of our fisheries. Our task is not completed, but we have progressed toward a solution far enough to report on the development of definite programs. Additional, more specific information will be provided in later sections of this report.

Our research staff has been studying the salmon fisheries throughout the State, and on the Columbia River in cooperation with the State of Washington. We have studied the commercial and recreational fisheries on our rivers and on the ocean and have adopted regulations, where the Commission had the authority; in other instances, regulations have been recommended. Although the Legislature cooperated wholeheartedly in providing the Commission with the authority to regulate the fisheries, in certain respects this authority is so limited as to make impossible the over all management of the resource. The limited authority granted has helped immeasurably but it is desirable that this authority be strengthened.

Great efforts by our Engineering Division have added literally hundreds of miles of spawning area for natural reproduction of salmon. Some of our greatest accomplishments have been in this field, where impassable barriers have been removed and efficient fish-ladders have been installed in dams and falls. Additional stream areas have been opened by removing debris from post-logging operations.

Our Hatchery Division has supplied young fingerling salmon to re-stock these areas made available for the first time in years, in order to build up as quickly as possible the natural runs to these newly opened spawning areas. Hatchery production has been found to contribute considerably to the maintenance of salmon production, and in the future, with the available river areas greatly reduced, hatcheries will become more essential in the reproduction of salmon.

In addition to salmon many of our other fisheries have been studied. These include shell fish, marine fish and other anadromous fish. Much factual information has been obtained which will lead to the adequate management of our fishery resources.

The Pacific Marine Fisheries Commission, set up in the three Pacific Coast States to provide for cooperative management of the offshore fisheries of mutual concern, has been organized and is now functioning. The Fish Commission and its staff actively participated in the draft of the compact and the organization of the Commission. It has accomplished a great deal during the past year, in providing for discussion by the fisheries agencies of problems affecting all three States, and it is expected to accomplish much in the future in obtaining coordinated fisheries regulations all along the Pacific Coast.

Our progress during the past two years, has been considerable. The measurement of success, however, will be the maintenance and, in some cases, an increase in the production from our fisheries resources. Only a beginning has been made; even more intensive efforts on the part of the Commission and the people of Oregon will be required to ensure the proper conservation of the fisheries. These efforts must be consistent. It is too much to expect and too extravagant to put great efforts into fisheries conservation for only a few years; great efforts must be maintained at least until adequate data have been gathered, conservation programs have been formulated and placed into effect, and the results of these efforts measured in the subsequent maintenance of the resource.

Appropriations and Revenue

During the first year of the biennium the department was operating on a partially self-sustaining and appropriative basis. The 1947 legislature made a general fund appropriation of \$767,058.00 for expenditure by this department during the biennial period from July 1, 1947 to June 30, 1949, which included \$53,523.00 for transfer to the Department of State Police, leaving a balance of \$713,535.00 available to the department during the 1947-1949 biennium. The Fish Commission has drawn on this appropriation during the second year covered by this biennial report.

Beginning July 1, 1947, all receipts flow into the general State Treasury, except funds provided by the Federal Government for specific purposes, in which cases such Federal funds are deposited with the State Treasurer in special fund accounts and disbursed accordingly.

At the time the 1947 legislature considered our appropriation for the 1947-1949 biennium, it was estimated that our receipts for that biennium would amount to \$346,800.00. However, at this time they can reasonably be estimated at \$421,984.00. This is an increase of \$75,184.00 over the amount anticipated for general state purposes accruing from this source.

The steady rise in salaries and wages, materials and supplies has made it necessary to curtail our operations and activities somewhat during the second year of the biennium so as to avoid a deficit, and none is anticipated at this time. However, if we will be obliged to continue payment of the cost of living salary adjustment of \$20.00 per month beyond December 31, 1948, it may become necessary that additional funds be appropriated for this purpose, in as much as the Emergency Board Appropriation authorized on May 12, 1948, provided funds for this purpose only through December 31, 1948.

During the fiscal year ending June 30, 1948, we sustained an estimated loss of some \$25,000.00 at our Bonneville and Ox Bow Fisheries Stations, as well as losses at other hatcheries, because of flood waters. The funds required to repair these losses must necessarily come from the current appropriation, the 1947 legislature having removed payment for such losses from the Restoration Fund. It is, therefore, my recommendation that the Restoration Act be amended to include reimbursement from the Restoration Fund for storm and flood damage.

A detailed statement of receipts and disbursements during the biennial period from July 1, 1946 to June 30, 1948, together with other statistical data, is shown elsewhere in this report.

DIVISION OF FISH CULTURE

The releases of spring chinook and silver salmon fingerling reared to migratory age assume added importance as the fish cultural work progresses. The returns from marking experiments on silver salmon carried out at the Bonneville and Alsea stations by the Division of Research supplied an abundance of evidence which indicates that the advanced feeding program has produced large returns of adult fish. Considerable evidence as to the value of migratory age releases, in particular with respect to silver salmon, is shown in the remarkable returns of silver salmon to the Klaskanine Station. At this station 4,909,000 silver eggs were collected during the biennium and of this number 1,818,000 were released at migratory age of 15 months. The steady increase of returning adults at Klaskanine is a constant reminder of the value of long term feeding.

The proper distribution of liberation stock is of great importance, and careful study is given to "feeder" streams in which releases are contemplated. It is impossible to hold for advanced feeding the total number of resulting fingerling from a season's egg take. Therefore, when the station's holding facilities become crowded, liberations are made in the upper reaches of streams, after careful study has been made for suitable locations. Such liberations usually occur in May or June, after the season of violent floods and stream fluctuations. Thus, the loss which might occur to eggs and fry hatched under natural conditions during violent storms is avoided.

Of the 50,010,000 fingerlings that were liberated during the season of 1947, in the streams of Oregon, 3,456,000 were 12 months old or over. During 1948, 39,727,000 fingerlings were distributed in the streams of Oregon, of which 2,830,000 were at least 12 months old or over. For the first time in the history of the Willamette stations, spring chinook were held through the year. Holding spring chinook through the year for long-term feeding presents many difficult problems. However, the job was carried out very creditably, and it is now a part of our yearly program. At the Middle Willamette Station 435,000 yearling spring chinook were liberated in the spring of 1947, and at the McKenzie 169,000.

Although much has been accomplished during the past biennium in the way of improvement and rehabilitation of fish cultural facilities at the various stations, a considerable amount of work yet remains to be accomplished in the necessary process of renewal of buildings, structures, and other equipment of our hatchery system.

The Columbia River flood of 1948 damaged the Bonneville and Herman Creek stations to the extent of approximately \$25,000. The immediate partial repair and replacement of equipment lost at these stations was imperative in order to properly handle the large runs of fall chinook regularly occurring at these sites. This unforeseen expenditure caused the discontinuance of renewals and improvements planned for other stations. The increased costs of materials and labor since the budget for the past biennium was approved has also greatly curtailed our rehabilitation program. However, several important improvements have been accomplished throughout the field. A new dam, pipe line and water supply, and a new set of ponds with concrete sides have been placed in operation at the Rock Creek Station. A new dam and intake box were installed at the Klaskanine Station. A new pipe line and dam were built and placed in operation at the Foley Creek Station. At the Trask Station concrete walls were added to several ponds. The Gold Creek channel was straightened and a dyke was constructed along its west bank. A holding pond

for adult salmon was excavated near the dam in Gold Creek. At the Coos Station two new ponds with the necessary adjuncts were added to the station's facilities. A new concrete intake box was built into the dam at Big Creek and new baskets provided for the station.

New standard size hatching troughs were provided for the Willamette, McKenzie and Ox Bow Stations. A concrete floor was laid at the McKenzie Station, and new dams and screen frames were built in all the ponds. New dams and screen frames were also added at the South Santiam Station. New motorized equipment was added and various other types of equipment placed in service at several stations, replacing that which was worn out.

Improvement of facilities at other stations has been scheduled, and it is hoped that funds will be available during the next biennium to complete this work.

Ox Bow Station:

The egg take at the Ox Bow Station has been steadily increasing, reaching its peak in 1947, with a take of 5,206,000 eggs. In addition, approximately 2,000,000 eggs were deposited by fish which were allowed to spawn naturally in Herman Creek itself. New troughs and a new hatching house floor were added during the spring of 1948. The facilities at this station are fast becoming inadequate to properly care for the increasing number of eggs handled each year and plans are being prepared for their enlargement.

Bonneville Station:

As at Ox Bow, the egg take continues to show a steady increase for both chinook and silver salmon. The total egg take of fall chinook for the years of 1946 and 1947 amounted to over 40 million eggs.

The run of silvers at this station was not very large in 1947, yet there was a substantial increase over that of any previous year. The egg take of this species amounted to 900,000. Marking experiments were conducted on this cycle to determine the proper time of liberation and the percentage of returns. Of the total number of 700 adult fish handled, 287 were fish which had been marked when liberated as yearling from this hatchery.

The Columbia River flood during the spring of 1948 inflicted considerable damage to this station. In addition to the physical damage caused to the cold storage plant, dams, ponds, equipment and all other buildings, the stock of chinook and silver salmon fingerling was carried out by the high water which flooded the pond system. The loss of the silver fingerling was particularly damaging, since a maximum return from this species can only be expected when held through into the following year and released at the age of approximately 14 months. In addition to rectifying, as much as possible, the damage caused by the flood, some improvements were made. A concrete floor was laid in both the garage and shop, and a power saw was rigged to prepare spawned salmon carcasses for grinding and storage. An additional liberation truck was purchased which is based at Bonneville and used in liberating fish from the Commission's hatcheries. Two such trucks are now kept in active service.

Klaskanine Station:

The Klaskanine Station is a very important adjunct to our lower Columbia River operation. From this point a large part of the fish food required at other stations is dispatched. The egg take during the past two years for both chinook and silver salmon has been good, with both species showing a steady increase in numbers of adults arriving at the racks. Long-term feeding of silvers has been carried on here extensively for several years. As many improvements as were permissible under the budget were completed. Among others, a 10-ton cold storage plant and new 3-phase electrical equipment were added to the food house.

McKenzie Station:

The propagation work at the McKenzie is concerned solely with the spring chinook. In the spring of 1947 a large run of salmon, variously estimated up to 4,000 arrived at the rack site. A heavy run-off occurring in July from melting snow and rain severely damaged the head rack, and over half of the fish being held below the racks escaped into the upper stream. The egg take from this run amounted to 2,781,000. A rack was also installed at the mouth of the Walterville Power Canal which prevented fish from entering the diversion. Although some salmon probably passed on upstream, considerable numbers remained at or near the rack site. The fungus condition which has been appearing of late years and which has been the cause of considerable mortalities, was less in evidence in 1947.

The egg take in the fall of 1946 amounted to 4,191,000. An estimated 2,000,000 additional eggs were deposited naturally in the headwaters by salmon allowed to pass through the racks.

A new series of ponds 700 feet in length, with the necessary dams and screens, was placed in operation during the early spring of 1948. New dams and screens are being constructed in the original series of ponds. The two hatching houses were given a coat of paint, and many other minor repairs to equipment and facilities were made.

Middle Willamette Station:

The established policy of this department is to allow for the escapement of a large percentage of each year's run for natural propagation. In line with this policy, a sufficient escapement was permitted through the racks in both the 1946 and 1947 runs to provide for a plentiful natural seeding of the Middle Willamette. The egg take at this station in 1946 was 1,846,000, and an escapement representing 700,000 eggs was permitted above the racks. The egg take for 1947 at this station was 2,209,000 with a potential egg take of 2,959,000, the difference being those deposited by fish allowed to spawn above the rack site. It is now the practice of the department to hold for 14-month feeding 500,000 fingerling at this station. A few improvements have been made. The cold storage plant was converted from gasoline to electrical operation. New troughs were provided, and many alterations which add to convenient and efficient operation of the station were instituted.

North Santiam Station:

As at the Middle Willamette Station, provisions were made for a sufficient escapement of the returning adults stopped at our Breitenbush rack to allow for a sufficient natural seeding in the upper reaches of this stream. The egg take at this station in 1946 was 3,036,000, with a potential egg take of 4,100,000, the difference being those deposited in the streams by natural spawning. The egg take in 1947 was 2,247,000, and a sufficient number of fish was allowed to pass on upstream for the purpose of natural spawning to make a total of 2,887,000 eggs. In neither of these years was the loss of adults at the rack site from the now prevalent fungus condition very great.

South Santiam Station:

Very few improvements have been carried out at this station during the past biennium. No attempt is made to hold fingerlings through the year to migratory size before release is made. This is because of the high temperatures which prevail in the South Santiam River at the present hatchery site. The egg take on the South Santiam River in 1946 was 1,519,000 with a potential egg take of 2,000,000. In 1947 the egg take was 49,320 with a possible egg take of 2,000,000. The small egg take in 1947 was occasioned by high water and damage to the racks. At this station the absence of fungus condition is more noticeable than at other stations. The fish usually hold through the summer in very good condition. It is impossible to hold fingerlings for any great length of time at the South Santiam

Station because of a shortage of water and the small number of ponds. Plans are being prepared for providing an additional water supply and more modern concrete ponds. New dams and screens were provided during the biennium for the existing series of ponds.

Sandy River Station:

The water supply at the Sandy River Station is not considered satisfactory. There are also other detrimental features which make the operation of this station difficult and uncertain. Studies are being conducted on other sites, and it is expected that the present location will be abandoned for one more favorable to fish cultural operations. The fish cultural work at this station has been very satisfactory, considering the many difficulties with which the station is confronted. Over 1,000,000 spring chinook eggs were taken in 1946, but the run in 1947 was very small, due to the small flow of water which passed through our rack site that year. No improvements or alterations have been made at this station, since it is expected that the present site will be abandoned.

Tillasqua Station:

The Tillasqua Station is located on Big Creek, a tributary of the lower Columbia River. Extensive improvements have been undertaken, but are yet in the early stages. However, some important improvements have been completed, such as changing the cold storage plant from gas-operated to electrically-operated. Also new grinding equipment has been added. A concrete catch basin 21 feet long and 8 feet wide was installed at the dam site. This has worked out very successfully, in that it has eliminated many hours of work cleaning the screens, and also provides additional head for the water supply. The egg takes at this station have been very satisfactory, with a constant increase each cycle. This is especially true of the silver salmon, which have been released in large numbers each year at migratory size. The egg take in 1946 at the Big Creek station was 1,728,000 for silvers and 828,000 for fall chinook. The 1947 egg take for silvers was 693,000 and for fall chinook 787,000. In the case of silver salmon approximately 1,000,000 eggs were deposited naturally.

Foley Creek Station:

The water supply system at Foley Creek was completely rebuilt. A new pipe line was laid for the pond system, and a dam for supplying water to the pond system was constructed. A new 8-inch pipeline was added replacing the old one to the hatching house. Sufficient water of a desirable temperature is now available for year-around feeding. The egg take for 1947 was good and promises to be much better for 1948. The loss of fingerling held for the 14-month period was almost negligible. While the runs of salmon now entering Foley Creek are small, it is reasonable to believe, based on results obtained at other stations operating under similar conditions, that this station, operating under its rebuilt and enlarged water supply, will in a short time greatly increase the runs of salmon in the Nehalem River and Foley Creek, a tributary to the Nehalem. A permanent rack has been built in Foley Creek and is located adjacent to the hatching house, which tends toward efficiency of operation.

Trask Station:

Many improvements and renewals were consummated at this station, and additional work along this same line has been outlined for the coming biennium.

Two million fall chinook eggs were shipped into this station in the fall of 1947 and were liberated during the summer months of 1948 in the upper reaches of the Trask River. Approximately 100,000 of these were turned over to the Research Division for a marking experiment. Fifty-thousand of this number were released in the early spring, and the balance in the fall. The egg takes at the Trask were smaller in 1947 than in 1946 because of our policy of allowing a greater number of fish to spawn naturally in the upper tributaries of the stream.

The number of silver and fall chinook salmon spawned at this station during 1946 and 1947, especially the silver salmon, was a very small percentage of the total number arriving at the rack site. Because of severe storms, the racks were under water during most of the fall and winter months, and both the fall chinook and silvers, as well as chums, could pass over the racks without much difficulty. Based on counts taken intermittently as the fish passed over the racks, it was determined that a sufficient number of silvers passed up the Trask River and its tributaries in the fall of 1947 to have deposited 6,000,000 eggs. In 1946 the number was slightly less.

The spring chinook run has not increased at this station during the last two years, but has held its own. There was a slightly greater number of eggs taken in 1946 than in 1947, but this was occasioned by the allowance of a greater number of salmon to pass through the racks in 1947 than in 1946. The potential take was about equal in both years. Our long-term feeding program is in effect at this station for both chinook and silver salmon. The loss resulting from holding adult spring chinook salmon between the racks through the spring and summer months at this station is negligible. There is no evidence of fungus or "white heads," as found in some Willamette streams.

Alsea Station:

A few minor repairs and improvements have been carried out at this station. New dams and screens were constructed in Hatchery Creek. A new by-pass flume in this stream was built to replace a former one carried out by a flood in the winter of 1947. A permanent rack and a watchman's cabin were constructed on the Five Rivers at Fisher. This added facility will provide a sufficient egg take for the station, on a stream which is more suitable for holding racks and more accessible than the former site. A cold storage plant is planned for the station.

The present water supply does not permit the holding of a very large number of fingerling for 14-month feeding. However, releases from this station have produced remarkable results. Returns from marking experiments carried on at this station on silver salmon indicate that a large percentage of the fish taken by the offshore fisheries in 1947 were released from the Alsea Hatchery and likewise a large percentage of those entering the Alsea River originated at the Alsea Station. The egg take in 1947 for silver salmon amounted to 882,178; however, over eight million eggs were available.

South Coos Station:

Fish cultural work at the South Coos Station is greatly handicapped by the intensive logging operations being carried on in the watershed of this stream. Splash dams are also being used to carry logs downstream to tidewater. The unrestricted cutting of timber in this area has denuded the watersheds to such an extent that violent floods are of frequent occurrence, causing serious damage to spawning areas and the population of fingerling and fry. The low summer flow of the stream has been gradually reduced and water temperatures correspondingly raised.

In spite of the low summer flow and high temperatures prevailing at the South Coos Station, the fingerling raised and liberated from this station have been of the finest quality, averaging 25 to the pound on nine month's feeding. The cost of operation has been very low. Slightly less than two pounds of food was required to produce a pound of fish, at an average cost of four cents per pound, or approximately eight cents for each pound of fish liberated. The average fish food cost per pound of fish liberated at most stations is approximately nine and one-half cents.

This station has been used as a source of supply of fingerlings in supplementing the salmon runs of the Coos, Umpqua, and Coquille River systems.

Metolius Station:

The Metolius Station is only partially completed at this date. The water supply system and five concrete ponds were placed in operation in the fall of 1947. Other temporary facilities have been provided in order that the station might be kept in operation. The hatchery water supply is obtained from a spring which has a flow of 60 second-feet, with an almost constant temperature. A remnant of a blueback salmon run inhabits this stream. Also spring chinooks are still present in significant numbers. It is expected that with the help of artificial propagation, these valuable runs may again attain their former abundance.

Siletz Station:

As indicated elsewhere, this station has been almost entirely rebuilt. The water supply system is being rearranged, with a new dam and pipe line which will be in operation before the 1948 egg take will have been completed. The hatching house has been enlarged and a new concrete floor laid. The egg takes during the biennium have held up very well, as evidenced by a potential egg take in 1947 of six million. During the coming biennium further development of the station is planned.

Every effort has been made to hold operating costs to a minimum at all stations, and in furtherance of this, all of the available spawned salmon carcasses have been stored wherever cold storage facilities were available and later utilized as fish food. During the past two years over 200 tons of such food were stored and expended as an important part of our regular hatchery diet.

Considerable field work has been done by qualified personnel in locating new hatchery sites and in planning new fish cultural developments. It is hoped that on many of our important salmon-bearing streams more modern rearing facilities may eventually be established which will contribute to the maintenance of valuable runs of salmon. The need of adequate rearing facilities is a factor which cannot be overlooked and which should be given careful consideration.

DIVISION OF ENGINEERING

The rapid increase in population in the State of Oregon has brought about an ever greater demand for salmon, not only as food fish, but as a sport fish as well. Because of this increasing public demand, the existence of this valuable natural resource is seriously endangered. Utilization of our major salmon streams for power development by the construction of high dams is forever closing to anadromous fish access to their ancient and vitally necessary spawning grounds. Logging operations west of the Coast Range have in many instances seriously damaged, if not totally destroyed, the value of some streams as spawning areas. Splash dams, used in logging operations, are probably one of the most destructive agencies for the extermination of salmon runs. They have been used freely on certain coastal rivers of Oregon.

For the past several years, depletion of the salmon populations has been noted with considerable concern, and the self-evident necessity of opening to entry and improving all available natural spawning areas is recognized by fisheries authorities. Three years ago the Fish Commission began a systematic program of stream improvement and rehabilitation. The purpose of this program, if permitted to be carried to its conclusion, is to restore the salmon streams of Oregon to a state of maximum productivity and thereby increasing the salmon runs.

During the past biennium the Engineering Division has been chiefly engaged in a program of fishway construction and general stream improvement. Of the projects com-

pleted, fourteen were fishways. One was an extensive repair job, six were new fishways bypassing natural falls, and seven were at privately-owned dams constructed by and at the expense of the owners. Four log jams were removed by this Division with equipment recently purchased by the Commission. One abandoned power dam was removed by blasting.

Although this Division is under-staffed, nevertheless frequent inspections were made of the large number of fishways and water diversions located throughout the state.

Numerous complaints concerning obstructions caused by logging operations were investigated, and in instances where definite responsibility could be placed, the offending operators were directed to remove such obstructions.

Surveys of several natural falls where fishways are needed have been made. Plans and cost estimates for this work have been prepared for budgetary purposes for the coming biennium.

In cooperation with the Game Commission, negotiations have been started with the Portland General Electric Company for the installation of a rotary screen at their Marmot Dam in the Sandy River. Likewise, the two Departments have successfully negotiated with the Pacific Power & Light Company for an electric fish screen and a new fishway at the Powerdale Dam in the Hood River.

The construction of new fishways and removal of log jams as listed below will give migratory salmon and trout free access to many miles of stream system heretofore considered blocked.

Oregon City Falls:

Considerable repairs were made to the fishway at Oregon City Falls during the summer of 1947. The low water entrances were entirely rebuilt, and several new baffle walls were installed in the main section of the fishway. In addition to these new installations, other baffle walls and training walls that had been seriously undermined by erosion were repaired. The entire ladder system was cleared of boulders and loose rubble, and new facilities for fish counting were installed in the uppermost section.

Wilson River:

A log jam, which was located in the Devil's Lake Fork of the Wilson River at a point three miles below Graham Bridge, was removed by blasting by the State Game Commission and the State Fish Commission.

Bear Creek:

A new fishway was installed at the Bear Creek Lumber Company Dam in Bear Creek, tributary of Salmon River, in Lincoln County.

Eagle Creek Falls:

A new fishway at Eagle Creek Falls was completed. Concrete baffles and training walls were installed to provide a permanent structure. The State Game Commission shared equally with this Department in the cost of the project.

Clatskanie River Falls:

An eight-foot falls in the Clatskanie River near Apiary was made passable by blasting a fishway through one side of the falls. This passageway now makes approximately 24 miles of headwaters accessible to upstream migrant salmon and trout.

Cedar Creek Falls:

A fishway was blasted through the nine-foot falls on Cedar Creek, a tributary of the

Siletz River. Prior to construction of this fishway, upstream migrant salmon and trout were unable to pass this obstruction except at extreme high water stage. Some 23 miles of headwaters above this point are now available to salmon and trout. The State Game Commission shared in the cost of this construction.

Thomas Creek:

The Scio Mill and Elevator Company has completed a new fishway at their diversion dam in Thomas Creek at Scio. The design and supervision of construction was handled by this Department and the Game Commission.

Sherar Falls:

The fishway at Sherar Falls in the Deschutes River, which was started in 1945, is now completed. Spring chinook, blueback salmon, steelhead and rainbow trout frequenting this stream are now able to readily pass this natural falls at all water levels.

Nehalem River Falls:

A bypass was blasted around the seven-foot falls in the Nehalem River near Batterson, Oregon. In the past, migratory salmon and trout have been unable to ascend this barrier except at high water stages. This bypass now affords easy passage to migratory fish, and makes more readily accessible some two hundred miles of the Nehalem River and its tributaries above this point.

North Santiam River:

A new fishway has been installed at the upper Gardiner diversion dam in the North Santiam River, which is approximately three miles above the city of Stayton. The Game Commission cooperated with this Department in negotiating with the owner for the installation of this ladder and assisted in the designing and preparation of the plans.

Negotiations with the Mountain States Power Company have brought about the construction of two fishways at their dam near Mill City, Oregon. The designing and planning, together with the negotiations for these structures, were with the cooperation of the State Game Commission.

Wolf Creek:

The Tye Lumber Company dam located near the mouth of Wolf Creek, a tributary of the Umpqua River, was provided with a new fishway. The State Game Commission cooperated in the designing and planning of this structure.

Little Nestucca River:

This Department has completed a new fishway at Stella Falls, which is located some five miles above the mouth of the Little Nestucca River. In the past, this barrier has been a serious menace to upstream migrants, and the installation of this passageway will make more easily available approximately 21 miles of the upper regions of this stream.

Rock Creek:

The Keasey Dam on Rock Creek, a tributary of the Nehalem River, was removed by blasting by the State Game Commission and the State Fish Commission. This 26-foot concrete dam has for years been a serious obstacle to migratory salmon and trout. An inadequate and poorly designed fishway was largely responsible for this unfavorable condition. The use of this barrier for the purpose of generating power was recently discontinued, and permission was granted by the owners for its removal.

Trask River:

Two large log jams and one smaller jam were removed from the South Fork of the Trask River. The crawler type tractor equipped with double drum winches and cables, which was recently acquired by this Department, was used to pull these jams from the stream bed and deposit them above the reach of high water. The two larger barriers removed have for several years been absolute blocks to migratory salmon, and by their elimination an additional three and a half miles of excellent spawning area has been made available to all types of anadromous fish frequenting this stream.

The channel of Gold Creek, a tributary of the Trask River adjacent to the Trask River Hatchery, was cleared of heavy rubble deposited by high waters and an embankment of boulders and gravel from the stream bed was built along the edge of the hatchery property as a protection from high water erosion.

Foley Creek:

At the Foley Creek Hatchery a new diversion dam for additional water supply was constructed in Foley Creek.

South Santiam River:

The Mountain States Power Company has completed a new concrete fishway at their diversion dam near Lebanon, Oregon. The State Game Commission and the Fish Commission worked cooperatively on the plans and designs for this facility.

Thomas Creek:

In cooperation with the State Game Commission, plans have been prepared for a new fishway at the Mountain States Power Company's Jordan Dam on Thomas Creek. This project is a part of the program of fishway construction which involves Mill City and Lebanon Dams.

DIVISION OF RESEARCH

Through the Research Division, biological studies are made to determine the causes of the decline in the various fish populations and to develop methods for the conservation and rehabilitation of the different species.

During the past biennium, the research staff has been increased from three to eleven biologists. This has permitted an expansion of our investigations which now includes studies on the following projects:

Columbia River System:

In cooperation with the Washington State Department of Fisheries, extensive investigations have been inaugurated on the Columbia River. By tagging large numbers of salmon in the lower part of the river, the time and rate of migration of the various species as they ascend the river are being determined. In addition the destination of fish passing through the lower river at various times is being ascertained. Spawning ground surveys are being conducted to find out where and at what time the various species spawn and the condition of the spawning areas. Through this work, estimates of the percentage of the runs which escape to the spawning grounds can be determined. These facts are necessary to develop a proper fisheries management program for this river.

Special attention was given to the blueback salmon fishery, which was at an extremely low ebb in 1944 and 1945. Using the powers delegated to the Fish Commission by

the 44th legislature the blueback fishing season was almost eliminated by prohibiting fishing during the major part of the run. For the first time in the history of the Columbia River the season was staggered in order to protect the fish as they continued up the river. This protected not only the bluebacks but a very significant migration of spring chinook salmon. This drastic restriction can be relaxed as the blueback runs improve, and the crop of fish can be harvested with proper regard for escapement and future runs.

Work on the Willamette River has involved assessing the magnitude of the sport catch, the run passing Oregon City, and the migration and distribution of fish on the spawning grounds. The sport catch, which was studied jointly with the Game Commission was 12,630 fish in 1946 and 12,000 in 1947; the escapement above Oregon City falls was 55,000 and 45,000, respectively. The approximate percentage of fish entering each spawning stream in the Willamette system was determined.

Serious and abnormal losses of adult salmon in the Walterville diversion on the McKenzie River mentioned in the 1947 biennial report have been prevented from recurring by excluding the fish from the diversion.

Fisheries problems of the Columbia system are serious and are expected to become more acute during the next ten years. McNary Dam, which is under construction, will be higher than any ever surmounted by large runs of migrating salmon. The construction of other dams in the Snake River will add to the problem. On the Willamette several dams projected by the Federal Government will completely block important runs of spring chinooks. Much time has been spent assessing expected damage to fish runs and formulating plans for mitigating the damage. This phase of the research work is very important because upon it to a great extent rests the responsibility for maintaining many of the salmon runs in the Columbia and Willamette Rivers,

Coastal Rivers:

The commercial production of salmon from the coastal rivers has decreased sharply since 1924. Investigations have shown that this decline has been partially occasioned by the withdrawal of many of these streams from commercial production. In addition to this, the fishing intensity on the other rivers has been gradually reduced through shortened seasons, lowered fishing deadlines, and gillnet mesh-size regulations.

During the past biennium a laboratory has been established at Bay City. This has served as headquarters for the coastal rivers studies and the emphasis of this work has been shifted from the Umpqua River to the Nehalem, Nestucca, and rivers tributary to Tillamook Bay. However, some studies have been conducted on the other coastal rivers as well. Surveys of the rivers have shown, as did the previous work on the Umpqua, that the decline in salmon production has been brought about, in part, by a reduction in the size of the salmon runs themselves. This has been occasioned by damage to the spawning areas by logging operations and fires and the removal of gravel from the stream beds for construction purposes. In addition to this, detailed analysis of the catch records indicate that overfishing has also contributed to the decline of the salmon populations. As rapidly as possible, the various coastal rivers are being studied and preliminary measures to correct the conditions causing the reduction in runs are being developed.

With the cooperation of the Engineering and Hatchery Divisions, preliminary management programs have been inaugurated on the coastal rivers during the past biennium. A stream improvement program has been undertaken and, as rapidly as funds permit, the Division of Engineering is removing log jams and building fishways over such barriers as falls and dams. This is making much additional spawning ground available to the salmon. Planting practices are being developed whereby the Hatchery Division is restocking with fingerling salmon those rivers and tributaries where the populations have been seriously reduced.

Following intensive studies, the Research Division recommended further changes in the river gillnet fishery regulations for the coastal rivers. These recommendations, designed to provide for a greater escapement of salmon to the spawning grounds, were incorporated by the Fish Commission into the fishing regulations for 1948.

It is believed that the continuance and expansion of the above program will markedly increase the salmon runs in the coastal rivers.

Marine Fisheries:

Studies of our marine fisheries involve such species as albacore, pilchards, salmon, sharks and bottom fish. The headquarters for this work is located at our laboratory in Astoria. Most of these fisheries are in a declining state of production.

Since it has been determined these fish for the most part migrate extensively along the coast, their abundance is of mutual concern to California, Washington and Oregon. Consequently during this biennium, cooperative studies of the ocean fishes have been undertaken by the research staffs of the three states under the auspices of the Pacific Marine Fisheries Commission. Tagging programs are being conducted to determine the migrations of the different species. Studies are being made of the effects of different fishing gear on the various species. Population studies are being made to determine their rate of growth, age and relative present abundance. These data are necessary in order to develop a management program which will produce the maximum sustained yield from these fisheries. It has already become apparent that the fishing intensity on the pilchards and soupin sharks and some species of bottom fish must be reduced.

Studies of the troll salmon fisheries in 1946 and 1947 indicated that a reduced fishing intensity was necessary and, in 1948, the Fish Commission adopted regulations designed to accomplish this. Along with our river management plans this is expected to increase our salmon runs and improve utilization of this resource.

Shellfish:

During this biennium, a laboratory has been established at Newport on Yaquina Bay for shellfish investigations. Studies have been made of bay and razor clams, bay and ocean crabs, and oysters.

A study of the ocean crabs has been undertaken in cooperation with the State of Washington. The tagging of live crabs and returning them to the ocean has demonstrated the interstate migration of these animals. To date considerable progress has been made in obtaining data upon which to base management policies for our shellfish fisheries.

In addition, considerable time has been spent studying the possible effects to shellfish of the various channel and harbor improvements proposed by the U. S. Army Engineers.

Hatchery Biology:

The erection of multi-purpose dams by the U. S. Army Engineers and the U. S. Bureau of Reclamation on many of our salmon producing rivers will present many problems in the conservation of our fisheries. In fact, the maintenance of salmon runs in some of the rivers will depend entirely on artificial propagation. In addition, the use of hatcheries to supplement natural propagation is one of the keystones of our management programs for all the Oregon rivers. It is imperative, then, that the artificial propagation of salmon be carried on with maximum efficiency. With this in mind studies in hatchery biology are being conducted.

Various factors affecting the success of artificial propagation are being studied. Among these are: fish diseases, diets, and the best time of liberation of the young of different species.

Where hatchery fish are held in crowded conditions, they are subject to various disease epidemics. These may cause the loss of large numbers of fish if they are not detected and treated in time. For this reason the care and prevention of diseases is one of the main objectives of our hatchery biology investigation.

With the increasing need for artificial propagation throughout the United States, the demand by the various agencies for fish foods has resulted in a scarcity of the materials now being used to feed hatchery fish. If our hatchery program is to be further expanded, studies must be made to uncover or develop new products which can be utilized and still afford the fish an adequate diet.

Recent experiments conducted at the Bonneville Hatchery on the Columbia River and at the Alsea Hatchery on the Alsea River, have shown that the best returns from hatchery raised silver salmon were from those held at the hatcheries until they were a year old before being liberated. Similar experiments are being conducted on spring and fall chinooks. One hundred thousand spring chinook fingerlings and a like number of fall chinook fingerlings have been marked during the biennium in order to determine the best time of liberation for these hatchery reared fish.

During this biennium, the Fish Commission has started publishing a new series of bulletins entitled "Fish Commission Research Briefs." These publications are issued from time to time as research progress reports, and are designed to keep the public informed of the current progress and results of the biological investigations. The first number was published in April, 1948.

An expansion of this research program will yield further necessary scientific data upon which to base recommendations for future improvements and regulations and will enable us to obtain the maximum sustained yield from our fishery resources.

STATEMENT OF RECEIPTS AND DISBURSEMENTS

Biennial Period Ending June 30, 1948

RECEIPTS

	Fiscal Year Ending June 30, 1947	Fiscal Year Ending June 30, 1948
Licenses:		
Fishing	\$ 30,797.50	\$ 43,039.90
Dealers and Processors	12,721.35	14,180.00
Total License Receipts	\$ 43,518.85	\$ 57,219.90
Other Income:		
Poundage Fees	\$127,476.44	\$144,044.16
Fines and Confiscated Property Sales	2,658.64	3,421.86
Fish and Crab Tag Sales	950.90	388.16
Miscellaneous Income	537.30	1,230.72
Total Other Income	131,623.28	149,084.90
Total Revenue	\$175,142.13	\$206,304.80
Sundry Receipts:		
Transfers from Seal Fund	\$ 600.00	.....
Refunds of Miscellaneous Disbursements...	5,747.42	.....
U. S. Government—Planning Funds		
Metolius Hatchery .....	.....	\$ 7,250.00
Total Sundry Receipts	6,347.42	7,250.00
TOTAL RECEIPTS	\$181,489.55	\$213,554.80
RECEIPTS CREDITED TO STATE		
GENERAL FUND		206,304.80
Balance (Planning Funds		.....
Metolius Hatchery)		\$ 7,250.00
Appropriations:		
General Fund Appropriation 1947-1949		767,058.00
Emergency Board Appropriation May 12, 1948 — Salaries and Wages \$20.00 per Month Cost-of-Living Increase for June, 1948		789.28
TOTAL RECEIPTS AND APPROPRIATIONS	\$181,489.55	\$775,097.28

STATEMENT OF RECEIPTS AND DISBURSEMENTS—Continued

Biennial Period Ending June 30, 1948

DISBURSEMENTS

	Fiscal Year Ending June 30, 1947		Fiscal Year Ending June 30, 1948	
Oregon State Police		\$ 21,112.73		\$ 26,761.50
Division of Fish Culture — Artificial Propagation:				
Salaries and Wages	\$ 84,887.16		\$ 81,343.54	
General, Operating, Maintenance	45,572.69		62,722.39	
Hatchery Facilities and Equipment—				
Capital Outlay	64,140.67		81,530.11	
Planning Metolius Hatchery (Fed. Funds) ..		194,600.52	7,250.00	232,846.04
Division of Research:				
Agricultural Research Foundation, Corvallis For Technological Research in Develop- ment of Fisheries Products	\$ 2,500.00		\$	
Salaries and Wages	13,533.93		36,829.93	
General, Operating, Maintenance	6,337.48		17,624.48	
Research Facilities and Equipment—				
Capital Outlay	2,209.93	24,581.34	16,582.37	71,036.78
Division of Administration:				
Commissioners:				
Per Diem	\$ 420.00		\$ 1,080.00	
Expenses	631.97	1,051.97	885.60	1,965.60
Office and Miscellaneous:				
Salaries and Wages	\$ 31,658.97		\$ 35,117.31	
General, Operating, Maintenance	21,991.17		19,587.43	
Furniture and Office Equipment—				
Capital Outlay	1,796.30	55,446.44	1,763.73	56,468.47
Inspection and Patrol:				
Salaries and Wages	\$ 6,143.51		\$ 5,388.60	
General, Operating, Maintenance	2,309.85		1,942.97	
Equipment—Capital Outlay	(30.06)	8,423.30	172.20	7,503.77
Division of Engineering:				
Fishways, Stream Survey and Improvement:				
Salaries and Wages	\$ 7,183.07		\$ 12,851.02	
General, Operating, Maintenance	6,270.60		10,860.28	
Equipment—Capital Outlay	2,417.71	15,871.38	15,800.30	39,511.60
TOTAL DISBURSEMENTS		\$321,087.68		\$436,093.76
Balance		\$(139,598.13)		\$339,003.52
Balance at Beginning of Period		165,525.55		25,927.42
Balance at End of Period		\$ 25,927.42		\$364,930.94
Unexpended Balance of General Fund Appropriation 1945-1947			\$ 53.30*	
Unexpended Balance of General Fund "Fish Commission Fee Account" 1945-1947 ..			1,371.49*	
Unexpended Balance of General Fund Appropriation 1947-1949			363,506.15	364,930.94

*Available only for payment of obligations incurred prior to July 1, 1947, within statutory limitation.

ARRESTS FOR VIOLATION OF COMMERCIAL FISHERIES CODE

Fiscal Year Ending June 30, 1947

Fishing and delivering fish without a license	6
Fishing prohibited methods	34
Fishing closed seasons and closed waters	18
Dealing in food or shellfish without a license	22
Possession of overlimit of clams	17
Possession of under-size clams	2
Unlawful possession of food fish	2
Pollution of waters	14
Failure to file dealer reports	7
Miscellaneous violations	11
TOTAL ARRESTS	133

ARRESTS AND DISPOSITION OF CASES

Fiscal Year Ending June 30, 1947

County	Number of Arrests	Number of Convictions	No. Pending, Dismissed or Not Guilty	Amount of Fines Imposed	Amount of Fines Suspended or Remitted	Number Paroled or Suspended In Whole or Part
Baker	4	3	1	\$ 225.00	\$ 145.00	3
Benton	1	1	..	25.00	15.00	1
Clackamas	9	6	3	455.00	320.00	4
Clatsop	29	28	1	1,036.50	590.00	22
Columbia	2	2	..	125.00	50.00	1
Coos	4	4	..	400.00	100.00	2
Curry	3	1	2	400.00	25.00	1
Deschutes	1	1	..	25.00	20.00	1
Douglas	8	8	..	705.10	300.00	4
Gilliam	2	2	..	50.00	30.00	2
Jackson	2	2	..	150.00	.....	..
Lane	3	2	1	150.00	.....	..
Lincoln	13	12	1	487.00	306.00	9
Linn	4	4	..	120.00	20.00	1
Malheur	3	2	1	50.00	.....	..
Marion	8	8	..	325.00	240.00	5
Polk	2	2	..	100.00	50.00	1
Tillamook	6	1	5	101.40	.....	..
Umatilla	5	3	2	153.00	120.00	3
Union	21	21	..	1,015.00	55.00	3
Yamhill	3	3	..	65.00	50.00	1
TOTAL	133	116	17	\$6,163.00	\$2,436.00	64

ARRESTS FOR VIOLATION OF COMMERCIAL FISHERIES CODE

Fiscal Year Ending June 30, 1948

Fishing and delivering fish without a license	9
Fishing prohibited methods	23
Fishing closed seasons and closed waters	18
Dealing in food or shellfish without a license	35
Possession of over-limit of clams	16
Unlawful possession of food fish	5
Pollution of waters	38
Failure to file dealer reports	8
Miscellaneous violations	12
TOTAL ARRESTS	164

ARRESTS AND DISPOSITION OF CASES

Fiscal Year Ending June 30, 1948

County	Number of Arrests	Number of Convictions	Number Pending, Dismissed or Not Guilty	Amount of Fines Imposed	Amount of Fines Suspended or Remitted	Number Paroled or Suspended In Whole or Part
Benton	3	1	2	\$ 275.00	\$ 225.00	1
Clackamas	7	5	2	810.00	104.50	2
Clatsop	21	11	10	561.50	220.00	9
Columbia	4	3	1	600.00	125.00	2
Coos	11	10	1	850.00	145.00	4
Crook	1	..	1	10.00	.....	..
Curry	6	6	..	850.00	25.00	1
Deschutes	3	1	2	75.00	.....	..
Douglas	6	1	5	291.00	60.00	3
Hood River	2	1	1	35.00	.....	..
Jackson	2	..	2	.....	.....	..
Josephine	5	5	..	100.00	50.00	4
Lane	19	16	3	1,620.00	685.00	11
Lincoln	22	17	5	1,407.00	429.50	7
Linn	5	4	1	110.00	65.00	2
Malheur	1	1	..	10.00	.....	..
Marion	9	5	4	525.00	375.00	5
Multnomah	6	5	1	625.00	290.00	4
Polk	4	1	3	150.00	65.00	2
Tillamook	4	2	2	100.00	25.00	1
Umatilla	6	5	1	275.00	145.00	4
Union	2	1	1	185.00	.....	..
Wallowa	1	1	..	30.00	.....	..
Wasco	1	1	..	95.50	.....	..
Washington	2	2	..	75.00	55.00	2
Wheeler	6	5	1	150.00	145.00	5
Yamhill	5	4	1	36.00	15.00	1
TOTAL	164	114	50	\$9,851.00	\$3,249.00	70

EGG TAKE

Number of Eggs Taken at Stations Operated by The Fish Commission

Fiscal Year Ending June 30, 1947

Fisheries Station	Silver					Total
	Chinook	Salmon	Steelhead	Shad	Chum	
Alsea		256,370	428,000			684,370
Bonneville	16,586,000					16,586,000
Coos		17,280	185,299			202,579
Klaskanine	1,483,810	1,137,302	33,075			2,654,187
McKenzie	4,191,868					4,191,868
Ox Bow Springs	3,570,000					3,570,000
Sandy	1,067,387					1,067,387
Santiam, North	3,035,769					3,035,769
Santiam, South	1,519,279					1,519,279
Scappoose				6,750,000		6,750,000
Siletz		464,808	19,584			484,392
Siuslaw		226,888				226,888
Tillasqua	827,596	1,728,432	232,852		1,118,208	3,907,088
Trask	1,915,265	1,813,179			30,243	3,758,687
Umpqua	96,525					96,525
Willamette	1,846,488					1,846,488
Yaquina		53,590				53,590
TOTAL	36,139,987	5,697,849	898,810	6,750,000	1,148,451	50,635,097

EGG TAKE

Number of Eggs Taken at Stations Operated by The Fish Commission

Fiscal Year Ending June 30, 1948

Fisheries Station	Silver					Total
	Chinook	Salmon	Steelhead	Blueback	Shad	
Alsea	50,000	882,178				932,178
Bonneville	20,948,183	900,078		54,984		21,903,245
Coos		276,212				276,212
Klaskanine	1,207,890	3,771,768				4,979,658
McKenzie	2,781,463					2,781,463
Metolius	266,712					266,712
Nehalem		454,736	17,776			472,512
Ox Bow	5,206,000					5,206,000
Sandy	43,550					43,550
Santiam, North	2,246,930					2,246,930
Santiam, South	49,319					49,319
Scappoose					135,000	135,000
Siletz		824,396				824,396
Tillasqua	599,220	2,031,655				2,630,875
Trask	1,267,321	1,300,421				2,567,742
Willamette	2,208,688					2,208,688
TOTAL	36,875,276	10,441,444	17,776	54,984	135,000	47,524,480

FINGERLINGS AND FRY ON HAND

June 30, 1947

Fisheries Station	Chinook	Silver Salmon	Steelhead	Total
Alsea .....	.....	255,354	408,587	663,941
Bonneville	1,740,575	123,797	.....	1,864,372
Coos .....	.....	16,218	157,825	174,043
Klaskanine .....	.....	892,951	.....	892,951
McKenzie	188,204	.....	.....	188,204
Nehalem	49,554	104,452	.....	154,006
Santiam, North	97,053	.....	.....	97,053
Siletz .....	.....	437,006	19,005	456,011
Tillamook .....	.....	1,021,880	100,524	1,122,404
Willamette	483,479	.....	.....	483,479
TOTAL	2,558,865	2,851,658	685,941	6,096,464

FINGERLINGS AND FRY ON HAND

June 30, 1948

Fisheries Station	Chinook	Silver Salmon	Blueback	Total
Alsea .....	.....	632,386	.....	632,386
Coos .....	.....	613,440	.....	613,440
Klaskanine .....	.....	1,152,888	.....	1,152,888
McKenzie	616,464	.....	.....	616,464
Metolius	114,737	.....	45,546	160,283
Nehalem .....	.....	435,620	.....	435,620
South Santiam	44,012	.....	.....	44,012
Siletz .....	.....	765,522	.....	765,522
Tillamook .....	.....	860,973	.....	860,973
Trask	254,177	722,320	.....	976,497
Willamette	887,777	.....	.....	887,777
TOTAL	1,917,167	5,183,149	45,546	7,145,862

SEAL FUND

**Statement of Receipts and Disbursements
Biennial Period Ending June 30, 1948**

RECEIPTS — From Sale of Seal Certificates

License	Rate	No.	Fiscal Year		Fiscal Year	
			Amt.	Ending June 30, 1947	No.	Amt.	Ending June 30, 1948
Gilnet	\$ 2.50	588	\$1,470.00		595	\$1,487.50
Setnet	2.50	108	270.00		123	307.50
Troll	2.50	72	180.00		69	172.50
Seine	20.00	16	320.00		18	360.00
Trap	10.00	53	530.00		49	490.00
Canner	50.00	23	1,150.00	\$3,920.00	23	1,150.00 \$3,967.50
TOTAL RECEIPTS				\$3,920.00		\$3,967.50
Less: 10% Tithe to State General Fund.....				392.00		396.75
Balance Receipts After Tithing				\$3,528.00		\$3,570.75

DISBURSEMENTS

	Fiscal Year		Fiscal Year	
	Ending June 30, 1947		Ending June 30, 1948	
For Bounties Paid on Seals Destroyed	(139 @ \$10.00)	\$ 1,390.00	(77 @ \$10.00)	\$ 770.00
For Administrative Expenses		565.10		13.93
TOTAL DISBURSEMENTS		\$ 1,955.10		\$ 783.93
Excess Net Receipts Over Disbursements.....		\$ 1,572.90		\$ 2,786.82
Balance at Beginning of Period		12,434.47		14,007.37
Balance at End of Period		\$14,007.37		\$16,794.19

COMPARATIVE SCHEDULE OF LICENSES ISSUED

Fiscal Years Ending on June 30th

Licenses	Rate	1948	1947	1946	1945	1944	1943
Gillnet	\$7.50	1064	1022	982	874	857	871
Setnet	5.00	714	992	1438	1120	979	1098
Trap	25.00	49	53	59	53	46	43
Seine	Various	18	16	16	17	22	28
Troll	*\$5.00-2.50	73	73	69	71	71	67
Boatpuller	2.50	1	280	260	216	257	264
Personal	5.00	2693	....	....	....	....	....
Retail Fish Dealer and Peddler.....	5.00	1442	1295	1306	1118	929	911
Wholesale Fish Dealer.....	25.00	205	180	189	166	135	115
Broker	50.00	4	8	4	2	3	3
Buyer	5.00	100	....	....	....	....	....
Salmon Canner	25.00	32	32	26	13	11	15
Shellfish Canner	*15.00-Various	13	12	7	6	9	10
Reduction Plant	25.00	6	7	5	9	4	3
Bagnet	5.00	(d)155	(c)53	(a)106	(b)341	76	143
Carp Permit	1.00	20	....	....	....	....	....
Clam	5.00	601	708	815	514	297	225
Crab	5.00	....	288	375	301	346	268
Crawfish	5.00	1	24	28	21	20	12
Crab-Shrimp-Crawfish	5.00	244	....	....	....	....	....
Setline	*5.00-1.00	81	366	218	200	161	71
Bait Net	25.00	10	....	....	....	....	....
Delivery	Various	1091	1040	1124	1031	989	871
Supplemental to Delivery.....	Various	10	4	11	20	12	18
Total Licenses.....		8627	6453	7038	6093	5224	5036

*The 1947 Legislature increased the troll license fee from \$2.50 to \$5.00; the setline license fee from \$1.00 to \$5.00; and changed the shellfish canner license fee to \$15.00. (Chapter 319, Laws 1947.)

(a) Includes 75 issued for Sandy River Smelt.

(b) Includes 238 issued for Sandy River Smelt.

(c) Includes 8 issued for Sandy River Smelt.

(d) Includes 109 issued for Sandy River Smelt.

COMPARATIVE STATEMENT OF LICENSES ISSUED

License Years Ending on March 31st

Licenses	Rate	1948	1947	1946	1945	1944	1943
Alsea Bay and River							
Gillnet	\$ 7.50	77	48	41	34	41	37
Setnet	5.00	....	153	163	160	165	160
Boat Puller	2.50	2	3	4	2	5	3
Retail Fish Dealer and Peddler	5.00	33	37	50	29	27	36
Wholesale Fish Dealer	25.00	4	5	4	5	4	3
Clam	5.00	5	12	5	5	2	4
Crab	5.00	15	26	31	34	29	21
Crab-Shrimp-Crawfish	5.00	7	....	....	....	....	....
Total Alsea Bay and River		143	284	298	269	273	264
Brookings Harbor							
Wholesale Fish Dealer	\$25.00	1	....	2	1	1	....
Retail Fish Dealer and Peddler	5.00	....	....	....	1	3	....
Crab	5.00	....	....	1	....	....	....
Total Brookings Harbor		1	....	3	2	4	....
Chetco Bay							
Retail Fish Dealer and Peddler	\$ 5.00	3	3	8	3	....	....
Wholesale Fish Dealer	25.00	....	....	1	2	....	....
Crab	5.00	....	....	1	....	....	....
Total Chetco Bay		3	3	10	5	....	....
Clatsop Beaches							
Retail Fish Dealer and Peddler	\$ 5.00	....	....	2	1	....	1
Shellfish Canner	Various	....	....	3	3	2	1
Clam	5.00	589	716	424	242	197	57
Crab	5.00	2	3	11	19	15	19
Wholesale Fish Dealer	25.00	2	1	1	2	....	....
Buyer	5.00	1	....	....	....	....	....
Total Clatsop Beaches		594	720	441	267	214	78
Columbia River and Tributaries							
Gillnet	\$ 7.50	582	566	524	508	542	568
Setnet	5.00	251	240	220	177	184	161
Trap	25.00	55	54	53	48	44	41
Seine	Various	21	18	17	21	24	29
Troll	\$5.00- 2.50	65	67	84	64	50	55
Boat Puller	2.50	78	197	182	162	215	241
Retail Fish Dealer and Peddler	5.00	1011	954	862	744	725	739
Wholesale Fish Dealer	25.00	96	96	88	76	69	69
Broker	50.00	5	6	2	3	3	3
Shellfish Canner	\$15.00-Various	4	8	1	1	1	2
Salmon Canner	25.00	22	19	12	9	8	10
Reduction Plant	25.00	5	5	6	4	4	5
Bagnet	5.00	(d)101	(c)97	(a)304	(b)107	71	147
Clam	5.00	....	2	....	....	1	....
Crab	5.00	25	34	20	2	3	6
Crawfish	5.00	18	25	24	23	12	11
Setline	\$5.00- 1.00	173	239	186	142	99	43
Bait Net	25.00	1	....	....	....	....	....
Buyer	5.00	45	....	....	....	....	....
Carp Seine	1.00	8	....	....	....	....	....
Crab-Shrimp-Crawfish	5.00	12	....	....	....	....	....
Total Columbia River		2578	2627	2585	2091	2055	2130

- (a) Includes 263 issued for Sandy River Smelt.
- (b) Includes 14 issued for Sandy River Smelt.
- (c) Includes 52 issued for Sandy River Smelt.
- (d) Includes 62 issued for Sandy River Smelt.

COMPARATIVE STATEMENT OF LICENSES ISSUED — Continued

License Years Ending on March 31st

Licenses	Rate	1948	1947	1946	1945	1944	1943
Coos Bay and River							
Gillnet	\$ 7.50	34	60	56	37	35	19
Setnet	5.00	245	275	161	102	74	61
Boat Puller	2.50	23	39	15	9	15	5
Retail Fish Dealer and Peddler.....	5.00	53	51	38	25	27	33
Wholesale Fish Dealer.....	25.00	23	16	15	9	10	10
Shellfish Canner	\$15.00-Various	1	2	....	1	3	2
Salmon Canner	25.00	1	1	2	....	....	....
Clam	5.00	15	28	27	14	14	10
Crab	5.00	52	100	89	87	88	84
Broker	50.00	....	1	....	....	....	....
Crawfish	5.00	....	1	....	....	....	....
Setline	\$5.00-1.00	35	48	....	....	....	....
Buyer	5.00	1	....	....	....	....	....
Bait Net	25.00	3	....	....	....	....	....
Crab-Shrimp-Crawfish	5.00	15	....	....	....	....	....
Total Coos Bay and River.....		501	622	403	284	266	224
Coquille River							
Gillnet	\$ 7.50	47	29	28	38	44	50
Setnet	5.00	13	45	43	55	65	79
Boat Puller	2.50	1	2	2	2	4	10
Retail Fish Dealer and Peddler.....	5.00	13	13	11	16	17	14
Wholesale Fish Dealer.....	25.00	6	4	5	5	5	3
Clam	5.00	2	....	....	....	2	2
Crab	5.00	1	7	4	4	6	4
Buyer	5.00	1	....	....	....	....	....
Crab-Shrimp-Crawfish	5.00	1	....	....	....	....	....
Total Coquille River.....		85	100	93	120	143	162
Depoe Bay							
Retail Fish Dealer and Peddler.....	\$ 5.00	18	14	11	6	16	14
Wholesale Fish Dealer.....	25.00	4	3	4	2	2	5
Crab	5.00	....	....	8	21	12	9
Salmon Canner	25.00	1	....	....	....	....	....
Total Depoe Bay.....		23	17	23	29	30	28
Lincoln County Beaches							
Clam	\$ 5.00	17	7	8	3	4	2
Total Lincoln County Beaches.....		17	7	8	3	4	2

COMPARATIVE STATEMENT OF LICENSES ISSUED — Continued

License Years Ending on March 31st

Licenses	Rate	1948	1947	1946	1945	1944	1943
Nehalem River							
Gillnet	\$ 7.50	71	60	52	49	48	55
Setnet	5.00	....	127	115	125	108	110
Boat Puller	2.50	....	5	3	3	4	2
Retail Fish Dealer and Peddler	5.00	17	16	20	14	9	10
Wholesale Fish Dealer	25.00	5	9	5	4	2	3
Clam	5.00	1	....	1	....	....	....
Crab	5.00	3	8	10	11	5	6
Buyer	5.00	1	....	....	....	....	....
Crab-Shrimp-Crawfish	5.00	1	....	....	....	....	....
Total Nehalem River		99	225	206	206	176	186
Nestucca River							
Retail Fish Dealer and Peddler	\$ 5.00	7	9	6	....	....	1
Clam	5.00	....	....	1	....	....	3
Crab	5.00	....	....	1	....	....	1
Wholesale Fish Dealer	25.00	2	....	1	....	....	....
Salmon Canner	25.00	1	....	....	....	....	....
Total Nestucca River		10	9	9	....	....	5
Netarts Bay							
Setnet	\$ 5.00	6	4	4	4	6	6
Retail Fish Dealer and Peddler	5.00	3	5	4	1	1	1
Crab	5.00	6	13	13	4	5	9
Wholesale Fish Dealer	25.00	1	....	....	....	....	....
Crab-Shrimp-Crawfish	5.00	2	....	....	....	....	....
Total Netarts Bay		18	22	21	9	12	16
Port Orford							
Retail Fish Dealer and Peddler	\$ 5.00	8	2	3	1	1	1
Wholesale Fish Dealer	25.00	3	1	3	1	1	1
Crab	5.00	4	7	22	20	11	16
Salmon Canner	25.00	1	....	....	....	....	....
Crab-Shrimp-Crawfish	5.00	3	....	....	....	....	....
Total Port Orford		19	10	28	22	13	18
Salmon River							
Gillnet	\$ 7.50	....	1	2	1	1	....
Setnet	5.00	....	27	19	18	18	14
Boat Puller	2.50	....	1	2	1	2	1
Retail Fish Dealer and Peddler	5.00	....	7	8	5	7	1
Wholesale Fish Dealer	25.00	....	2	1	2	....	1
Total Salmon River .....		....	38	32	27	28	17
Sand Lake							
Setnet	\$ 5.00	12	5	5	2	5	6
Crab	5.00	....	....	....	....	....	1
Retail Fish Dealer	5.00	1	....	....	....	....	....
Total Sand Lake		13	5	5	2	5	7
Sandy River							
Retail Fish Dealer and Peddler	\$ 5.00	4	....	....	....	....	....
Total Sandy River		4	....	....	....	....	....

COMPARATIVE STATEMENT OF LICENSES ISSUED — Continued

License Years Ending on March 31st

Licenses	Rate	1948	1947	1946	1945	1944	1943
Siletz River							
Gillnet	\$ 7.50	35	5	4	3	3	5
Setnet	5.00	..	100	117	81	72	77
Boat Puller	2.50	..	1	3	2	2	4
Retail Fish Dealer and Peddler	5.00	24	25	31	23	14	11
Wholesale Fish Dealer	25.00	4	6	7	5	6	3
Crab	5.00	..	....	....	2	1	....
Total Siletz River		63	137	162	116	98	100
Siuslaw River							
Gillnet	\$ 7.50	43	35	32	31	30	31
Setnet	5.00	64	78	50	30	21	18
Boat Puller	2.50	2	10	4	7	8	8
Retail Fish Dealer and Peddler	5.00	29	30	27	16	17	13
Wholesale Fish Dealer	25.00	5	6	2	2	2	3
Clam	5.00	7	8	5	5	4	2
Crab	5.00	2	8	8	7	11	4
Buyer	5.00	1	....	....	....	....	....
Crab - Shrimp - Crawfish	5.00	1	....	....	....	....	....
Total Siuslaw River		154	175	128	98	93	79
Tillamook Bay							
Gillnet	\$ 7.50	113	90	82	71	73	59
Setnet	5.00	123	216	207	208	207	201
Boat Puller	2.50	..	9	8	7	7	5
Retail Fish Dealer and Peddler	5.00	46	42	31	28	21	27
Wholesale Fish Dealer	25.00	17	16	11	10	11	10
Salmon Canner	25.00	2	4	1	....	1	1
Shellfish Canner	Various	..	....	1	....	....	....
Clam	5.00	19	20	25	20	17	22
Crab	5.00	22	39	39	44	47	38
Buyer	5.00	2	....	....	....	....	....
Crab - Shrimp - Crawfish	5.00	11	....	....	....	....	....
Total Tillamook Bay		355	436	405	388	384	363
Umpqua River							
Gillnet	\$ 7.50	85	86	61	53	59	64
Setnet (Smith River)	5.00	99	79	86	79	81	73
Troll	2.50	..	2	1	....	....	....
Boat Puller	2.50	2	9	7	4	6	6
Retail Fish Dealer and Peddler	5.00	31	36	23	24	28	19
Wholesale Fish Dealer	25.00	7	9	9	6	7	5
Salmon Canner	25.00	1	1	1	1	1	1
Shellfish Canner	Various	..	....	....	2	2	4
Clam	5.00	7	11	12	4	2	2
Crab	5.00	4	4	2	5	3	5
Buyer	5.00	1	....	....	....	....	....
Crab - Shrimp - Crawfish	5.00	3	....	....	....	....	....
Total Umpqua River		240	237	202	178	189	179

COMPARATIVE STATEMENT OF LICENSES ISSUED — Continued

License Years Ending on March 31st

Licenses	Rate	1948	1947	1946	1945	1944	1943
Yaquina Bay and River							
Gillnet	\$ 7.50	27	27	21	23	25	24
Setnet	5.00	..	4	3	2	1	3
Boat Puller	2.50	..	5	2	3	4	4
Retail Fish Dealer and Peddler	5.00	50	51	48	34	33	40
Wholesale Fish Dealer	25.00	11	15	12	7	7	6
Clam	5.00	17	29	26	26	14	10
Crab	5.00	13	63	65	70	71	50
Setline	1.00	13	25	29	25	16	11
Shellfish Canner	15.00-Various	2	2	1	2	2	2
Salmon Canner	25.00	2	3	3	1	1	1
Reduction Plant	25.00	1	1	1	1	..	..
Bait Net	25.00	4	..	..	..	..	..
Crab - Shrimp - Crawfish	5.00	28	..	..	..	..	..
Total Yaquina Bay and River		168	225	211	194	174	151
Miscellaneous							
Troll (Pacific Ocean)	\$ 2.50	1	1	1	1	2	1
Delivery	Various	1073	1106	1086	930	911	842
Supplemental to Delivery	Various	14	5	13	19	13	16
Personal	5.00	1073	..	..	..	..	..
Crab (Pacific Ocean)	5.00	40	45	..	..	..	..
Total Miscellaneous		2201	1157	1100	950	926	859
Grand Totals		7289	7056	6373	5260	5087	4868
Recapitulation							
Gillnet	\$ 7.50	1114	1007	903	848	901	912
Setnet	5.00	813	1353	1193	1043	1007	969
Trap	25.00	55	54	53	48	44	41
Seine	Various	21	18	17	21	24	29
Troll	*\$5.00-2.50	66	70	86	65	52	56
Boat Puller	2.50	108	281	232	202	272	289
Retail Fish Dealer and Peddler	5.00	1351	1295	1183	971	946	961
Wholesale Fish Dealer	25.00	191	189	171	139	127	122
Broker	50.00	5	7	2	3	3	3
Salmon Canner	25.00	31	28	19	11	11	13
Shellfish Canner	*\$15.00-Various	7	12	6	9	10	11
Reduction Plant	25.00	6	6	7	5	4	5
Bagnet	5.00	(d)101	(c)97	(a)304	(b)107	71	147
Clam	5.00	679	833	534	319	257	114
Crab	5.00	189	357	325	330	307	273
Crawfish	5.00	18	26	24	23	12	11
Setline	*\$5.00-1.00	221	312	215	167	115	54
Delivery	Various	1073	1106	1086	930	911	842
Supplemental to Delivery	Various	14	5	13	19	13	16
Personal	5.00	1073	..	..	..	..	..
Crab - Shrimp - Crawfish	5.00	84	..	..	..	..	..
Buyer	5.00	53	..	..	..	..	..
Baitnet	25.00	8	..	..	..	..	..
Carp Seine	1.00	8	..	..	..	..	..
Totals		7289	7056	6373	5260	5087	4868

*The 1947 Legislature increased the troll license fee from \$2.50 to \$5.00; the setline license fee from \$1.00 to \$5.00; and changed the shellfish canner license fee to \$15.00. (Chapter 319, Laws 1947.)

(a) Includes 263 issued for Sandy River Smelt.

(b) Includes 14 issued for Sandy River Smelt.

(c) Includes 52 issued for Sandy River Smelt.

(d) Includes 62 issued for Sandy River Smelt.

SALMON ESCAPEMENT OVER BONNEVILLE DAM

Years 1938 to 1948

CHINOOK

	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948
January	*	6	....	4	1	11	1	6	1	....	10
February	*	12	....	....	15	6	2	4	2	2	....
March	*	121	504	1,360	34	43	65	81	25	141	251
April	*	51,410	37,253	51,501	9,506	12,172	15,670	17,148	14,179	83,520	21,205
May	22,371	25,159	28,621	19,445	30,915	53,268	15,127	26,276	53,313	49,899	20,262
June	8,221	5,602	7,028	7,013	11,816	5,440	4,363	11,293	30,051	25,502	44,137
July	6,556	17,845	14,938	9,395	12,821	8,044	8,241	16,327	20,960	13,358	23,100
August	34,765	32,919	58,643	12,590	27,581	28,985	55,468	32,254	45,421	43,062	35,934
September	197,294	150,851	240,515	351,967	303,995	201,414	139,254	189,675	277,075	260,385	270,238
October	2,302	2,197	3,765	7,179	4,485	3,354	2,388	4,281	4,521	3,945	....
November	263	78	287	866	639	365	164	137	170	526	....
December	27	16	34	134	190	21	20	6	25	36	....
Total	271,799	286,216	391,588	461,458	401,998	313,123	240,763	297,488	445,743	480,376	

STEELHEAD

	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948
January	*	23	5	37	4	14	50	1,003	63	197	154
February	*	19	96	76	37	18	157	1,078	551	321	119
March	*	560	1,688	1,641	256	654	1,019	3,066	3,040	1,968	1,631
April	*	8,110	4,125	6,392	3,642	3,374	6,142	4,685	9,839	6,889	4,473
May	6,622	1,587	998	1,518	4,159	4,698	2,227	1,557	5,481	2,025	1,170
June	2,382	1,490	4,489	994	1,588	1,564	1,169	1,109	3,265	1,595	1,895
July	19,455	36,581	61,175	21,940	19,905	7,755	21,868	24,600	20,559	28,134	33,191
August	29,231	38,062	46,071	29,600	41,973	29,894	24,508	40,483	58,356	40,819	53,621
September	46,618	33,891	64,377	50,542	76,622	41,051	35,907	40,194	38,296	50,025	40,609
October	2,264	1,264	1,786	3,980	2,411	2,444	6,129	1,925	2,067	2,905	....
November	339	216	292	1,063	566	573	1,119	302	262	443	....
December	92	119	59	304	182	92	226	142	769	113	....
Total	107,003	121,922	185,161	118,087	151,345	92,131	100,521	120,144	142,548	135,434	

BLUEBACK

	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948
January .....	*	....	....	....	....	....	....	....	....	....	....
February .....	*	....	....	....	....	....	....	....	....	....	....
March .....	*	....	....	....	....	....	....	....	....	....	....
April	*	48	....	299	....	....	1	10	....	....	....
May	1,025	189	206	1,052	13	9	16	521	67	5	....
June	17,811	29,386	59,639	23,536	12,624	4,525	3,098	1,507	7,805	59,378	12,023
July	53,864	43,124	85,885	39,193	41,301	33,613	11,171	6,903	64,704	108,175	117,652
August	2,097	616	3,063	1,615	1,477	1,697	659	498	1,746	3,564	1,850
September	235	19	11	50	60	1	127	11	23	17	14
October	6	....	1	....	....	....	....	1	2	1	....
November	2	....	....	....	....	....	....	....	....	1	....
December .....	....	....	....	....	....	....	....	....	....	1	....
Total	75,040	73,382	148,805	65,745	55,475	39,845	15,072	9,502	74,356	171,142	

*Data not available. Figures for 1938 are from May 7 to December 31, inclusive.

Figures show number of fish.

U. S. Engineers, Bonneville Division.

SALMON ESCAPEMENT OVER BONNEVILLE DAM—Continued

Years 1938 to 1948

SILVERSIDES											
	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948
January	*	3	3	2	.....	.....	.....	.....	.....	12	1
February	*	.....	.....	.....	.....	.....	.....	.....	10	2	.....
March	*	.....	.....	.....	.....	.....	.....	.....	4	1	.....
April	*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
May	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
June	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
July	.....	.....	.....	.....	.....	.....	.....	2	22	.....	11
August	3,070	1,810	1,451	1,317	1,193	762	1,052	239	227	217	158
September	10,995	12,226	10,212	16,061	11,061	1,676	3,021	533	3,609	10,928	3,893
October	972	310	213	369	147	89	103	16	1	10	.....
November	141	15	33	160	.....	20	29	.....	.....	3	.....
December	7	18	5	2	.....	.....	2	1	24	1	.....
Total	15,185	14,382	11,917	17,911	12,401	2,547	4,207	791	3,897	11,174	.....

CHUMS											
	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948
January	*	2	.....	.....	.....	.....	1	2	.....	.....	.....
February	*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
March	*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
May	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
June	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
July	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
August	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....
September	.....	6	.....	.....	.....	.....	.....	2	1	.....	.....
October	1,245	700	860	1,116	700	125	191	118	303	59	.....
November	799	411	835	4,130	1,149	623	666	585	809	110	.....
December	73	49	34	23	16	42	96	20	63	29	.....
Total	2,117	1,168	1,729	5,270	1,865	790	954	727	1,176	199	.....

TOTAL ESCAPEMENT BY MONTHS

	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948
January	*	34	8	43	5	25	52	1,011	64	209	165
February	*	31	96	76	52	24	159	1,082	563	325	119
March	*	681	2,192	3,001	290	697	1,085	3,157	3,069	2,110	1,882
April	*	59,568	41,378	58,192	13,148	15,546	21,812	21,884	24,027	90,409	25,678
May	30,018	26,938	29,825	22,015	35,087	57,975	17,370	28,354	58,861	51,929	21,432
June	28,414	36,478	71,156	31,543	26,028	11,529	8,630	13,909	41,121	86,475	58,055
July	79,875	97,550	161,998	70,528	74,027	49,412	41,280	47,832	106,245	149,667	173,954
August	69,163	73,407	109,228	45,123	72,224	61,338	81,687	73,474	105,750	87,663	91,563
September	255,142	196,993	315,115	418,620	391,738	244,142	178,309	230,415	319,004	321,355	314,754
October	6,789	4,471	6,625	12,644	7,743	6,012	8,811	6,341	6,894	6,921	.....
November	1,544	720	1,447	6,219	2,354	1,581	1,978	1,024	1,241	1,082	.....
December	199	202	132	467	388	155	344	169	881	180	.....
Total	471,144	497,073	739,200	668,471	623,084	448,436	361,517	428,652	667,720	798,325	.....

*Data not available. Figures for 1938 are from May 7 to December 31, inclusive.

Figures show number of fish.

U. S. Engineers, Bonneville Division.

NUMBER OF FINGERLINGS AND FRY LIBERATED INTO THE WATERS OF THE STATE OF OREGON BY THE FISH COMMISSION

Fiscal Year Ending June 30, 1947

Fisheries Station	Chinook	Silver Salmon	Steelhead	Shad	Chum	Total	Where Liberated
Alsea.....	492,318	(a)379,089	.....	.....	.....	871,407	Alsea R.
	.....	110,465	.....	.....	.....	110,465	Five Rivers R., Trib. Alsea R.
Bonneville.....	12,741,199	392,473	.....	.....	.....	13,133,672	Tanner Cr., Trib. Columbia R.
	.....	(b)429,836	.....	.....	.....	429,836	Tanner Cr., Trib. Columbia R.
Coos.....	.....	261,228	218,177	.....	.....	479,405	South Coos R.
	.....	20,700	.....	.....	.....	20,700	Mill Cr., Trib. Umpqua R.
	.....	19,964	.....	.....	.....	19,964	Smith R.
Klaskanine.....	1,140,497	3,568,312	.....	.....	.....	4,708,809	Klaskanine R., Trib. Columbia R.
	.....	17,612	.....	.....	.....	17,612	Fish Hawk Cr., Trib. Nehalem R.
	.....	5,508	.....	.....	.....	5,508	Columbia R.
McKenzie.....	3,259,348	.....	.....	.....	.....	3,259,348	McKenzie R.
	12,146	.....	.....	.....	.....	12,146	Cogswell Cr., Trib. McKenzie R.
Ox Bow Springs.....	3,259,589	.....	.....	.....	.....	3,259,589	Herman Cr., Trib. Columbia R.
Sandy.....	883,957	.....	.....	.....	.....	883,957	Sandy R., Trib. Columbia R.
Santiam, N.....	10,667	.....	.....	.....	.....	10,667	Stout Cr., Trib. N. Santiam R.
	2,487,987	.....	.....	.....	.....	2,487,987	N. Santiam R.
	86,920	.....	.....	.....	.....	86,920	Breitenbush R., Trib. N. Santiam R.
	109,684	.....	.....	.....	.....	109,684	Marion Forks Cr., Trib. N. Santiam R.
Santiam, S.....	25,124	.....	.....	.....	.....	25,124	S. Santiam R.
	434,676	.....	.....	.....	.....	434,676	Thistle Cr., Trib. S. Santiam R.
	(c)1,229,444	.....	.....	.....	.....	1,229,444	S. Santiam R.
Scappoose.....	.....	.....	.....	6,606,000	.....	6,606,000	Willamette R.
Seufert Bros. Ponds.....	31,113	.....	.....	.....	.....	31,113	Columbia R.
Siletz.....	.....	(d)346,296	.....	.....	.....	346,296	Rock Cr., Trib. Siletz R.
Siuslaw.....	465,771	200,057	.....	.....	.....	665,828	Lake & Knowles Cr., Trib. Siuslaw R.
	.....	386	.....	.....	.....	386	Indian Cr., Trib. Siuslaw R.
Tillasqua.....	786,944	693,018	.....	.....	1,048,000	2,527,962	Tillasqua R., Trib. Columbia R.
Trask.....	884,128	98,326	.....	.....	25,154	1,007,608	Gold Cr., Trib. Trask R.
	325,961	2,113,360	.....	.....	.....	2,439,321	Trask R.
	76,800	.....	.....	.....	.....	76,800	S. Fork Trask R.
	(e)1,029,866	.....	.....	.....	.....	1,029,866	Trask R.
Umpqua.....	1,422,405	512,586	.....	.....	.....	1,934,991	Rock Cr., Trib. Umpqua R.
Willamette.....	1,203,214	.....	.....	.....	.....	1,203,214	Salmon Cr., Trib. Willamette R.
Yaquina.....	493,979	.....	.....	.....	.....	493,979	Simpson Cr., Trib. Yaquina R.
	.....	49,842	.....	.....	.....	49,842	Yaquina R.
Total.....	32,893,737	9,219,058	218,177	6,606,000	1,073,154	50,010,126	

(a) (d) (e) Escapement during flood conditions.
 (b) (c) Escapement because of broken pond screen.

EGG TRANSFERS

Fiscal Year Ending June 30, 1947

FISHERIES STATION			RECEIVING STATION						
Source	Species		Alsea	Bonneville	Nehalem	Siuslaw	Trask	Umpqua	Yaquina
Bonneville	..Chinook	.....	499,875	.....	499,884	500,180	.....	1,499,910	499,875
Klaskanine	..Silver Salmon	.....	.....	125,000	.....	.....	.....	.....	.....
Nehalem	....Chinook	.....	.....	.....	.....	.....	499,884	.....	.....

**PACK OF CANNED SALMON ON THE COLUMBIA RIVER FROM THE INCEPTION
OF THE INDUSTRY TO 1947**

Year	Number of Canneries	Chinook		Blueblack		Silverside		Chum or Keta		Steelhead Trout		Total			
		Cases	Value	Cases	Value	Cases	Value	Cases	Value	Cases	Value	Cases	Value		
1866												4,000	\$ 64,000		
1867													18,000	288,000	
1868													28,000	392,000	
1869													100,000	1,350,000	
1870													150,000	1,800,000	
1871													200,000	2,100,000	
1872													250,000	3,325,000	
1873													250,000	2,250,000	
1874													350,000	2,625,000	
1875													375,000	2,250,000	
1876													450,000	2,475,000	
1877													380,000	2,052,000	
1878	30												460,000	2,300,000	
1879	30												480,000	2,640,000	
1880	29												530,000	2,650,000	
1881													550,000	2,475,000	
1882													541,300	2,600,000	
1883													629,400	3,147,000	
1884													620,000	2,915,000	
1885													553,800	2,500,000	
1886													448,500	2,135,000	
1887													356,000	2,124,000	
1888	28												372,477	2,234,862	
1889	21	266,697	\$1,600,182	17,797	\$101,051						25,391	\$108,587	309,885	1,809,820	
1890	21	335,604	1,946,087	57,345	290,069							42,825	171,300	435,774	2,407,456
1891	22	353,907	2,038,566	15,482	284,242							29,564	118,156	398,953	2,440,964
1892	24	344,267	1,996,388	66,547	372,909	4,176	\$ 20,880					72,348	288,892	487,338	2,679,069
1893	24	288,773	1,559,374	30,459	152,295	29,107	116,428	2,311	\$ 6,933		65,226	260,904	415,876	2,095,934	
1894	24	351,106	1,896,976	43,814	224,430	42,758	171,032				52,422	209,688	490,100	2,501,126	
1895	24	444,909	2,428,658	18,015	86,523	99,601	329,683	22,493	62,591		49,678	203,542	634,696	3,110,997	
1896	24	370,943	1,804,511	16,983	51,518	44,108	141,145				49,663	198,652	481,697	2,261,826	
1897	22	432,753	1,804,221	12,972	51,888	60,850	197,762				46,146	165,440	552,721	2,219,311	
1898	23	329,566	1,490,394	66,670	300,015	65,431	222,465				26,277	60,352	487,944	2,073,226	
1899	17	255,824	1,458,175	23,969	134,723	29,608	112,055	11,379	33,836		11,994	39,186	332,774	1,777,975	
1900	16	262,392	1,821,258	13,162	92,184	44,925	202,163	17,696	63,706		20,597	102,985	358,772	2,282,296	
1901													390,183	1,942,660	
1902	14	270,580	1,428,743	17,037	86,465	10,532	44,732	10,401	41,604		8,593	42,965	317,143	1,644,509	
1903	16	301,762	1,610,614	8,383	42,867	12,181	49,869	10,000	37,500		7,251	36,255	339,577	1,777,105	
1904	20	320,378	1,944,890	12,911	78,048	31,254	118,357	20,693	52,691		9,868	48,892	395,104	2,242,678	
1905	19	327,106	1,962,636	7,768	46,608	26,826	114,011	25,751	65,206		9,822	49,110	397,273	2,237,571	
1906	19	311,334	1,868,007	7,816	54,712	41,446	124,338	27,802	69,505		6,500	32,500	394,898	2,149,062	
1907	19	258,433		5,504		31,757		22,556			5,921		324,171	1,763,490	
1908	14	210,096		8,581		31,432		16,884			10,726		253,341	1,380,708	
1909	15	162,131	1,203,546	27,908	214,561	42,178	185,070	24,542	57,115		17,283	99,796	274,087	1,760,088	
1910	15	244,285	1,882,137	6,234	34,287	68,922	363,688	66,538	232,883		5,436	31,203	391,415	2,544,198	
1911	15	405,862	2,204,185	5,988	47,904	79,416	549,478	53,471	203,198		8,594	47,399	543,331	3,052,164	
1912	15	220,317	1,988,526	8,210	85,384	31,842	177,248	18,699	46,590		6,958	22,108	285,666	2,319,856	
1913	15	192,116	1,664,670	11,152	93,677	40,969	175,412	13,303	29,486		8,939	49,142	266,479	2,012,380	
1914	17	289,464	2,573,502	35,311	376,924	69,769	380,666	49,285	205,541		10,792	59,356	454,621	3,595,989	
1915	19	406,486	3,694,361	5,459	56,707	33,336	173,234	86,530	251,632		26,723	129,538	558,534	4,305,292	
1916	20	395,166	3,572,203	3,790	27,288	52,084	335,114	77,766	307,483		18,999	118,987	547,805	4,361,075	
1917	20	403,637	5,023,529	7,968	111,552	64,299	700,680	53,659	386,596		23,783	292,538	555,218	6,530,939	
1918	20	400,952	5,222,983	37,833	605,328	98,145	1,072,843	29,848	215,669		24,605	350,071	591,381	7,466,924	
1919	21	392,125	5,455,550	7,268	145,360	90,728	1,142,787	75,493	541,989		14,414	205,234	580,028	7,490,020	
1920	22	420,467	5,661,580	2,617	62,808	27,024	257,806	18,792	99,564		12,645	116,589	481,545	6,198,617	
1921	20	267,582	3,761,321	6,045	120,900	34,381	233,372	4,821	19,791		10,142	68,266	323,241	4,203,649	
1922	23	237,230	3,724,393	30,743	614,860	90,437	633,935	8,844	47,130		24,920	186,675	392,174	5,205,993	
1923	23	289,586	4,967,657	38,309	766,180	101,554	673,954	25,508	135,168		25,968	187,965	480,925	6,730,924	
1924	22	293,716	4,508,236	7,366	129,840	112,308	992,865	57,748	303,356		29,734	285,107	500,872	6,219,404	
1925	21	350,809	5,423,129	5,650	106,220	113,554	1,488,855	55,812	272,398		14,637	177,866	540,452	7,488,468	
1926	21	295,302	4,744,131	21,736	434,720	97,142	1,027,597	32,853	181,216		32,690	356,418	479,723	6,744,064	
1927	22	339,446	5,559,202	6,887	147,378	74,879	585,816	68,449	425,240		30,148	311,070	519,809	7,028,705	
1928	24	251,404	4,355,218	4,814	100,131	49,136	478,355	124,953	747,619		16,339	222,139	446,646	5,903,462	
1929	21	242,938	4,234,214	10,072	181,296	90,684	917,561	54,619	314,928		23,804	257,025	422,117	5,905,024	
1930	21	281,346	4,092,810	9,823	194,460	110,430	1,156,042	11,371	43,324		16,535	171,541	429,505	5,058,177	
1931	20	294,798	3,754,929	4,125	66,000	39,268	247,878	3,518	11,764		11,990	110,429	353,699	4,191,000	
1932	15	216,511	2,023,390	2,795	33,540	46,492	280,853	17,261	44,879		13,132	91,924	296,191	2,474,586	
1933	14	251,157	2,719,303	6,921	96,894	36,430	263,190	24,398	107,351		17,805	142,440	336,711	3,329,178	
1934	13	251,860	2,630,152	6,869	82,428	65,428	536,731	24,485	92,608		14,901	121,000	362,721	3,462,191	
1935	10	305,078	2,479,450	1,302	17,619	95,184	725,868	15,495	89,499		14,888	122,846	322,739	3,405,282	
1936	11	220,188	2,964,058	9,837	137,718	36,541	303,263	30,597	110,149		19,282	317,807	316,445	3,833,055	
1937	11	291,343	4,256,819	7,526	126,436	69,801	725,996	30,592	138,309		17,568	189,734	416,830	5,437,800	
1938	10	173,892	2,707,267	13,889	260,369	67,257	630,394	37,704	143,275		15,248	152,480	307,990	3,893,755	
1939		207,595	3,336,209	5,301	102,359	69,082	730,549	13,201	75,416		25,293	421,608	322,472	4,686,471	
1940	11	244,570	3,785,881	23,974	471,530	59,737	623,681	25,282	125,420		33,436	373,514	386,999	5,379,826	
1941	9	328,609	5,558,254	33,070	661,400	35,727	481,834	83,144	572,994		33,162	453,502	513,712	7,727,984	
1942	12	274,750	5,692,929	23,256	625,230	26,541	497,070	118,051	911,538		21,803	429,878	484,401	8,156,445	
1943	11	130,373	3,094,505	2,880	77,586	5,707	611,065	12,439	112,421		16,261	325,844	367,680	3,669,451	
1944	10	163,047	3,714,591	758	20,342	12,210	137,072	1,525	11,590		19,222	373,538	196,762	4,259,433	
1945	8	132,014	3,095,228	112	3,001	22,154	244,060	1,032	8,848		19,314	363,068 (a)	175,670	3,723,456	
1946	11	159,872	5,940,740	9,726	369,588	6,883	206,490 (b)	15,617	247,392		17,373	510,720 (b)	209,471	7,274,390	
1947	10	250,318	8,613,000	15,079	664,000	42,789	1,278,000	17,121	252,000		21,999	650,000	347,306	11,457,000	

31,858,050 \$289,538,159

(a) Includes 1,044 cases of Pinks canned from Puget Sound fish.

(b) Includes 1,873 cases of Pinks canned from Puget Sound fish.

(We are able to show the above table through the courtesy of the Pacific Fisherman.)