

OREGON FISH COMMISSION
Biennial Report
1966-1968

ON THE COVER

THE MIGHTY COLUMBIA

The great river of the west still supports tremendous runs of anadromous fish despite the encroachment of "civilization".

Biennial Report

JULY 1, 1966—JUNE 30, 1968

TO THE

Governor and the Fifty-fifth
Legislative Assembly

OREGON FISH COMMISSION

COMMISSIONERS

EDW. G. HUFFSCHMIDT, Chairman

McKEE A. SMITH, Vice Chairman

JOSEPH I. EOFF, Member

ROBERT W. SCHONING
State Fisheries Director

THE COMMISSIONERS



Edw. G. Huffschmidt, Chairman, Portland

Ed is a native Oregonian. He is owner of Western Foundry Company and Industrial Iron Works, both in Portland.

He is past president, Associated Oregon Industries; trustee, Oregon Museum of Science and Industry; and board member of the National Association of Manufacturers.

He is an avid hunter, fly fisherman and gun collector.



McKee A. Smith, Vice Chairman, Scappoose

Educated in Portland schools, Mac is president of Smith Brothers Office Out-fitters in Portland and is on the board of a number of other business organizations, both in Oregon and California.

He settled in Oregon during early youth.

His spare-time interests include fishing, collecting and rebuilding antique cars, and boating.



Joseph I. Eoff, Member, Salem

Joe, the most recently appointed commissioner, attended Oregon State University and graduated from the University of Oregon.

He served as an officer in the Air Force during the Korean conflict and has been associated with Eoff Electric Company since 1952.

A native Oregonian, Joe's avocations include hunting, fishing and falconry.



Herman P. Meierjürgen, Retiring Chairman, Beaverton

Pete, commission chairman for eight years, was held over into the first year of the 1966-68 biennium awaiting appointment of a successor.

Living in Oregon since early youth, he's a veteran of the Oregon State Police in the 1930's, the Army in WW II and the lumber business from the war through the early 1960's.

In active retirement, Pete is a past member of the Hillsboro High School Board, is a member of the Oregon State Sanitary Authority and serves on the Oregon Museum of Science and Industry Board of Trustees. He's an earth and life science buff, participating in OMSI's science training and outdoor camps.



Leonard N. Hall, Retiring Member, Charleston

A native of the Pacific Northwest, Leonard completed his education in Kansas. He established the JACKSONVILLE MINER, in Jacksonville, Oregon in 1932. In 1940 he turned to commercial fishing and has been at it ever since except for a Coast Guard tour in WW II.

He serves on the Charleston School Board, Coos County Rural School Board, and the Marshfield District No. 9 Budget Committee.

His hobby, the Snug Harbor Railroad, features a quarter scale, three ton "Prairie" locomotive, rolling stock, and one-fifth mile of track.



FISH COMMISSION

OFFICE OF THE DIRECTOR

307 STATE OFFICE BLDG. • 1400 S.W. 5th AVE. • PORTLAND, OREGON • 97201

TOM McCALL
GOVERNOR

COMMISSIONERS
EDW. G. HUFFSCHMIDT, Chairman
MCKEE A. SMITH, Vice Chairman
JOSEPH I. EOFF, Member
ROBERT W. SCHONING
State Fisheries Director

December 30, 1968

Edw. G. Huffschtmidt, Chairman
McKee A. Smith, Vice Chairman
Joseph I. Eoff, Member

Gentlemen:

In accordance with the provision of ORS 506.121, I herewith submit for your approval this concise written report of the activities of the Oregon Fish Commission during the biennium ending June 30, 1968.

Respectfully submitted,

Robert W. Schoning
ROBERT W. SCHONING
STATE FISHERIES DIRECTOR



FISH COMMISSION

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JOSEPH I. EOFF, Member
ROBERT W. SCHONING
State Fisheries Director

December 31, 1968

To His Excellency, THE GOVERNOR,
and the Members of the Fifty-Fifth Legislative Assembly

Gentlemen:

Herewith is transmitted with our approval the biennial report of the Oregon Fish Commission for the period from July 1, 1966 to June 30, 1968 as required by ORS 506.121.

FISH COMMISSION OF THE STATE OF OREGON

Edw. G. Huffschtmidt
Edw. G. Huffschtmidt, Chairman

McKee A. Smith
McKee A. Smith, Vice Chairman

Joseph I. Eoff
Joseph I. Eoff, Member

**Number of Permanent
Employees as of
June 30, 1968**

Administration	--	27
Engineering	----	18
Fish Culture	-----	79
Research	-----	75
Total	-----	199

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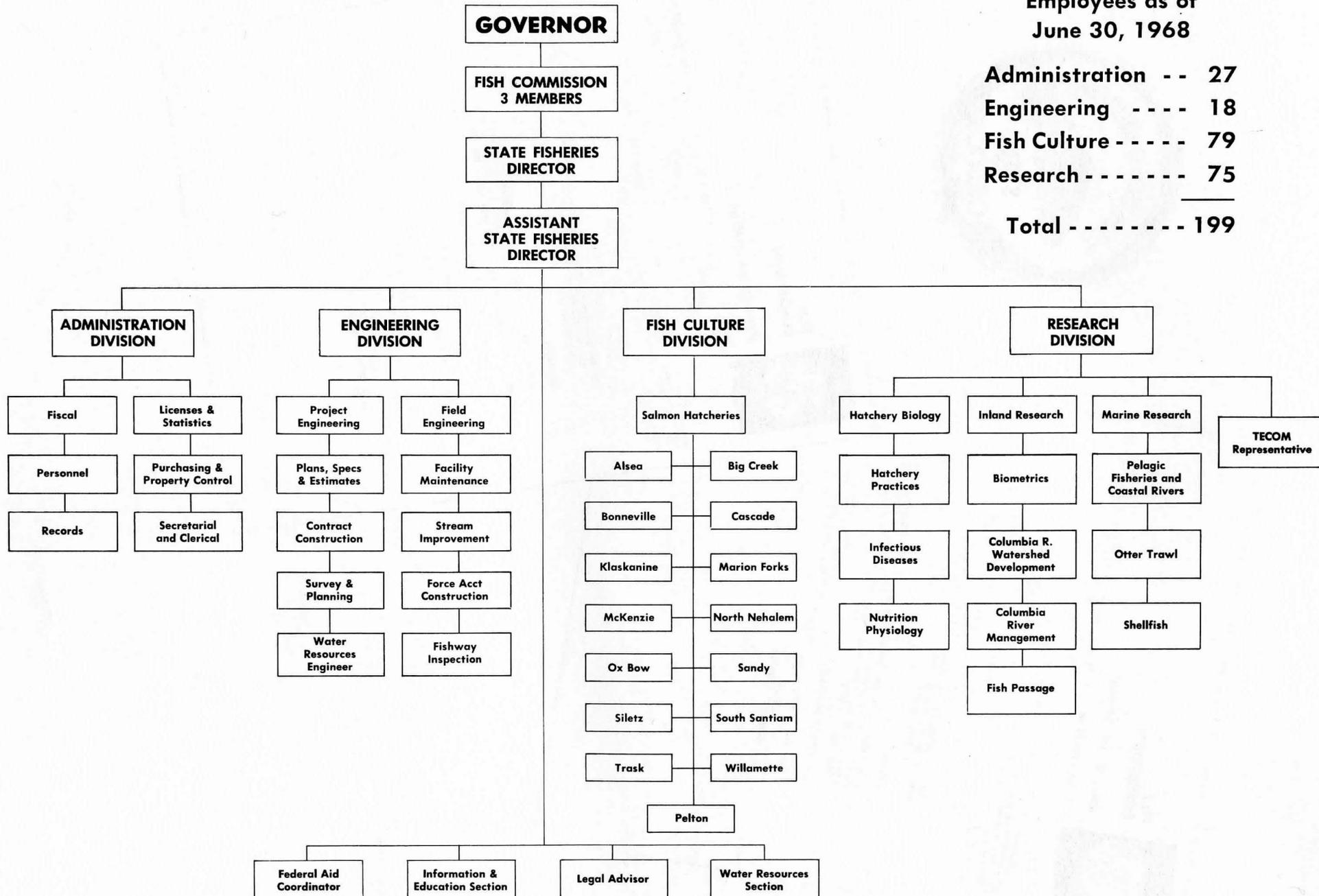


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Cul-de-sac portion of the new Willamette Falls fishway (right-center) was completed during the biennium to replace the old inadequate ladder (upper-left) at Oregon City's historic barrier to migrating fish. A ladder constructed at the Falls in 1885 was the first such work ever undertaken in Oregon.

HISTORY OF THE OREGON FISH COMMISSION

Since the earliest days of the white man's Oregon explorations, salmon and other food fish have held an important place in the area's economy. In 1792, Captain Robert Gray entered the "Great River of the West." In addition to naming the stream after his ship, the **Columbia Rediviva**, he engaged in brisk trade with the natives. Among the items traded were salmon, which Gray bartered for at the rate of one nail for two fish.

Long before Gray arrived on the scene, however, Indians along the river, especially those in the warmer, drier interior, caught and dried great quantities of salmon. Those surplus to their personal needs were traded to other tribes for items not locally obtainable.

So the history of exploitation of the state's fishery resources is a long one. There were few problems when the population was a relative handful of tribesmen. But as white settlers began to pour into the country, the future of this valuable natural resource became an object of concern to those with an eye to the future.

In 1848, the constitution of the territory contained a section demanding that streams in the territory "in which salmon are found or to which they resort shall not be obstructed by dams or otherwise, unless such dams or obstructions are so constructed as to allow salmon to pass freely up and down — — —." But as is often the case, there is not always the means to enforce the edicts of the lawmakers. It is said that by 1900 there were at least 200 unladdered dams on tributaries in the Columbia River system. These were not all in Oregon, to be sure, but they all helped grind away at the Columbia River anadromous fish runs.

As early as 1878 there were demands that specific attention be given to the fish resources of Oregon. In response, that year the state legislature established a position of Oregon Fish Commissioner. From the meager records at hand, it is difficult to determine what the first commissioner did, nor is it entirely clear just what was expected of him. The appointment did trigger a series of boards and commissions that were created and replaced with disconcerting frequency over the next forty years.

In 1887, the legislature set up a three-man State

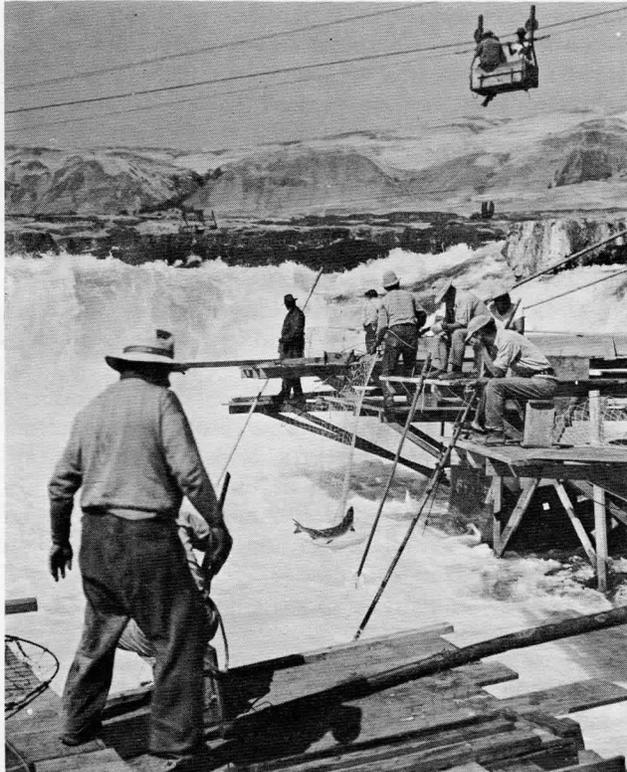
Board of Fish Commissioners. The main duty of the board was enforcement of fish and game laws. With a tight hand on the purse strings, the legislature doled out \$1,000 to erect and maintain a salmon hatchery and to support the Fish Commission for the ensuing two years.

In April of that year, the board leased from the Oregon and Washington Fish Propagation Company—for one dollar—a hatchery on the Clackamas River at the mouth of Clear Creek. During its first season, 15 million eggs were taken. A resulting 1.3 million fry were released into the Clackamas River.

With no money to run the hatchery a second season, the board withdrew from this initial fish cultural effort and the U. S. Commission of Fish and Fisheries assumed operation of the hatchery.

In 1888 the board spent considerable time examining Columbia River tributaries for a hatchery site. They concluded there were no suitable sites in the Columbia River system in Oregon. They proposed, therefore, that appropriate legislation be enacted by Oregon and Idaho to allow the board to secure a hatchery site in Idaho. Apparently, the idea was not met with overwhelming acceptance and nothing came of it.

In 1893 the first fish and game protector was appointed. Hollister McGuire, the new appointee, was a progressive thinker in fish and game matters. Not content to simply accept the premise that fish hatch-



Indians dipnet fished at now famous Celilo Falls prior to inundation by The Dalles Dam reservoir.



Gill-net fleet on the lower Columbia, circa 1900, awaiting the tide to begin fishing.

eries contributed substantially to runs, he initiated a fin-clipping program to try to scientifically determine their contribution, if any. Of the 5,000 salmon marked, 32 returned.

Apparently impressed by his work, in 1898 the legislature appointed McGuire to the position of Fish Commissioner in another reorganization that established a Board of Fish Commissioners. Other members of the board were the Governor and the Secretary of State. Shortly after his new appointment, McGuire drowned in the Umpqua River while looking for a hatchery site.

In 1899 a Game Board was established. The system of two separate boards dealing respectively with fish and game matters prevailed for some years. In 1911 the two boards were merged. The new organization was known as the Board of Fish and Game Commissioners.

The board was abolished in 1915 and replaced with a Fish and Game Commission. In 1920, a Board of Fish and Game Commissioners, with a chairman for the board and one each for the Fish and Game Commission, replaced the 1915 body.

In 1921, the state legislature set up two separate agencies, a Fish Commission and a Game Commission, an arrangement which has continued to the present.

By statute, the duty of the Fish Commission entails protection, preservation, propagation, cultivation, development and promotion of food fish, shellfish, and intertidal animals. The commission has joint or other jurisdiction with any other state or government over all fishes within the waters of the Columbia River and its tributaries where such waters form state boundaries. The commission has no jurisdiction over game fish, as defined in ORS 496.010.

FROM THE DIRECTOR'S DESK

With each passing year, management of Oregon's valuable fisheries resources becomes more complex, more exacting and always more demanding. Our state's burgeoning population, industrial, and agricultural growth place greater demands on our natural environment. Because our fisheries resources are among our most sensitive environmental barometers, each year the need for truly comprehensive resource management becomes more acute, as old problems are accentuated and new ones created. Each year, too, our fisheries horizons are expanding and we accept the attendant challenges.

Elsewhere in this report are the details of many of the commission's specific activities during the 1966-68 biennium. In many cases this discussion will be accompanied by a resume of problems met and successfully overcome through scientific research, management and personal dedication. In others, it will be clear there is much yet to do.

The 1966-68 biennium was characterized by its striking fisheries contrasts and increasing political, social and economic challenges. It is to a portion of these sometimes intangible, but always important issues, I wish to address myself in this section of the Fish Commission's 1966-68 report of progress to the Governor, the Fifty-fifth Legislative Assembly, and the citizens of Oregon.

Perhaps the most spectacular fisheries news during



Michigan conservationist Dr. Howard Tanner obviously enjoyed his coho fishing in Oregon. Dr. Tanner is credited with the idea of introducing Oregon coho into Lake Michigan, the results of which have been spectacular.



State Fisheries Director Robert W. Schoning (center) points out future needs at Willamette Falls fishway to Dick Pressey, Assistant Program Director of the Bureau of Commercial Fisheries (left), Ed Neubauer, Fish Commission Director of Engineering (background), and Waldemar Seton, Vice President of Portland General Electric (right).

the biennium was the raft of record and near-record coho salmon landings. In the fall of 1966, gill net fishermen in the Columbia River landed 4.2 million pounds of coho, the highest catch since 1929. The following year, the ocean troll fishery landed more than 8 million pounds of coho in Oregon, beating the previous records set in 1935 by 25%. The sport fishery at the mouth of the Columbia smashed all records that year too, landing more than 300,000 coho. The river gill net fishery landed 3.8 million pounds, the second highest catch since 1929.

While the coho landings during the biennium were most spectacular, chinook landings were also substantial.

Although the majority of Columbia River-produced chinook are caught in the ocean troll fisheries from Alaska to California, sport fishermen landed an all-time record 77,000 chinook at the mouth of the Columbia in 1967. The river gill net fishery that same year landed 3.9 million pounds, almost one million pounds more than in 1966.

The 1967 Willamette spring chinook run of 74,400 was the second largest on record. Sport fishermen below Willamette Falls caught approximately 15,000 and 56,000 went over the falls. Almost 25% of the escapement returned to our Willamette Hatcheries. The 1968 run was down substantially but escapement was good and the sport catch in the river below Willamette Falls was well above average.



Construction began on the Fish Commission's Elk River Hatchery during the biennium. This "gadget" is compacting the soil beneath what will be the hatchery's rearing ponds.

The record and near record salmon landings during the biennium almost overshadowed two other particularly significant fisheries, shrimp and albacore tuna. The 1967 shrimp landings reached a record 10.5 million pounds compared to the ten year average of 2.5 million pounds. Oregon's albacore landings reached an all-time record high of nearly 28 million pounds in 1967, 350% above the thirty year average.

But the 1966-68 biennium was one of fisheries contrasts, and some of our valuable upriver salmon and steelhead runs reached lows as disturbing as the record landings of other species were spectacular. The continued decline of summer chinook put this run at a new low in 1966 and again in 1967, despite closures of sport and commercial fisheries throughout the states of Oregon, Washington and Idaho. Summer steelhead runs were also at a low ebb.

Filling of John Day reservoir during the spring of 1968 compounded upriver problems. Inadequate fish passage facilities blocked virtually the entire spring chinook run for a brief period of time until the Corps of Engineers and fishery agencies personnel improvised corrective measures. The problems at John Day emphasized the continuing difficulties facing our upriver salmon and steelhead runs as a result of the hydroelectric development of the mainstem Columbia River, and underlined the need for more intensive research aimed at making this development more compatible with maintaining productive upriver runs.

The increasing problems in the upper Columbia

basin during the biennium also stressed the need for continued re-evaluation of our remaining natural production areas. As the total area decreases, the remaining area becomes increasingly valuable.

The most striking example of improving potential salmon and steelhead production during the biennium was our accelerating Willamette River development programs.

The cul-de-sac portion of the new Willamette Falls fishway became fully operational during the biennium at a cost of \$1.4 million. Approximately \$1.9 million in additional funds—at 1967 prices—are necessary to complete the remaining portions of the fishway located in the main horseshoe area of the falls.

The federal government is providing the lion's share of the fishway funds through the Columbia River Fishery Development Program administered by the U. S. Bureau of Commercial Fisheries. Portland General Electric is contributing 16.3 per cent of total project cost in accordance with the degree industrial development at the falls has compounded natural passage difficulties.

No federal moneys are in sight for the remaining construction work due to the general clampdown on non-defense expenditures. However, we are confident the merits of providing year-round passage at the falls and the continued support of our congressional delegation will generate the necessary funds in the near future.

Cooperating with the U. S. Fish and Wildlife Serv-

ice, we continued our hatchery releases of fall chinook into the Willamette. The Oregon Game Commission and the Fish and Wildlife Service again aided in hauling surplus adult coho from our hatcheries for release into the system to utilize natural spawning potential.

In the closing days of the biennium, 1.7 million fall chinook smolts were released from the Salem Cascades Gateway Park pond into Mill Creek, tributary to the Willamette. This natural rearing pond venture, in cooperation with the Regional Parks Agency, was an offshoot of our successful experiments

within the 12-mile limit where Russian vessels could conduct loading and repair operations only. This agreement was renewed in 1967 and remained in effect throughout the biennium.

Closer to home, giant strides were made during the biennium toward resolving the concern generated by the presence of the intensive, unregulated Indian commercial fishery in the Columbia River above Bonneville Dam. In handing down a decision on the case of Puyallup vs. State of Washington, the U. S. Supreme Court established guidelines for regulation of off-reservation Indian fishing. The decision reinforced the



Russian vessels, such as this trawler (known as an SRT) fishing for hake off the Oregon coast, have caused interference with the operation and fishing success of American vessels.

at Wahkeena natural rearing pond under Bureau of Commercial Fisheries funding. We are extremely optimistic about the potential of natural rearing ponds and plan a many fold expansion of those operations in the Willamette basin in future years.

Although primary emphasis was placed on our inland fisheries programs, much attention during the biennium was required on international fisheries matters. In 1966, a large Russian fishing fleet moved into the North Pacific, concentrating primarily on hake and Pacific ocean perch, species of importance to Oregon fishermen. The intense harvest of the available perch stocks and the size and number of Russian vessels interfered considerably with the operation and fishing success of American vessels.

Through a series of scientific and administrative meetings between the Soviet and U. S. officials, a one-year agreement was formulated in late 1966 which spelled out fishing areas available to each country. Certain areas off the Oregon coast were closed to all trawling by vessels over a certain size to protect the interests of our fishermen and conserve perch stocks heavily harvested by the Russian fleet in previous years. In return, the U. S. provided specific areas

state's right to regulate off-reservation fishing, while at the same time preserving the Indians' right to fish in their usual and accustomed places. We are optimistic that within this framework, and with the constructive assistance provided by the forum of the Governor's Columbia River Indian Treaty Fishery Council, our management program, the resource, and all users will benefit.

Illustrative of the increasing complexities of fisheries resource management, long range plans for thermo-nuclear power development within the Columbia River basin were aired during the biennium. These plants require large volumes of water from our streams for cooling. Our commission and other fisheries agencies became concerned about the possible deleterious effects of large scale heated water effluents on the sensitive anadromous fish. Consequently, we publicly voiced our support and concurrence with the Oregon State Sanitary Authority's interpretation of our state water quality standards requiring treatment of all wastes amenable to treatment, with particular emphasis on thermal wastes. We are confident this positive approach to pollution control will provide a clearcut atmosphere for the impending development of valuable

nuclear-produced electrical energy and at the same time insure the well-being of our fishery resources.

Somewhat analogous to the scope of problems solved during the biennium, the work yet to do, and contrasts in the status of our fisheries, fishery-oriented legislation also met with varying degrees of success during the 1967 session. Several bills passed during the session were of particular interest to the commission. Senate Bill 8 prohibits removal of material from the bed or bank of any Oregon stream without a permit from the State Land Board. Such permit to be issued only after consultation with the fisheries agencies to insure against detrimental effects to fish. House Bill 1395 authorized the commission to construct Elk River Salmon Hatchery on the southern Oregon coast, and appropriated \$191,000 from the state general fund to match federal funds available through Public Law 89-304, administered by the Bureau of Commercial Fisheries. The Fish Commission first proposed a hatchery on Elk River in 1957, so it was heartening to see the proposal become reality during the biennium.

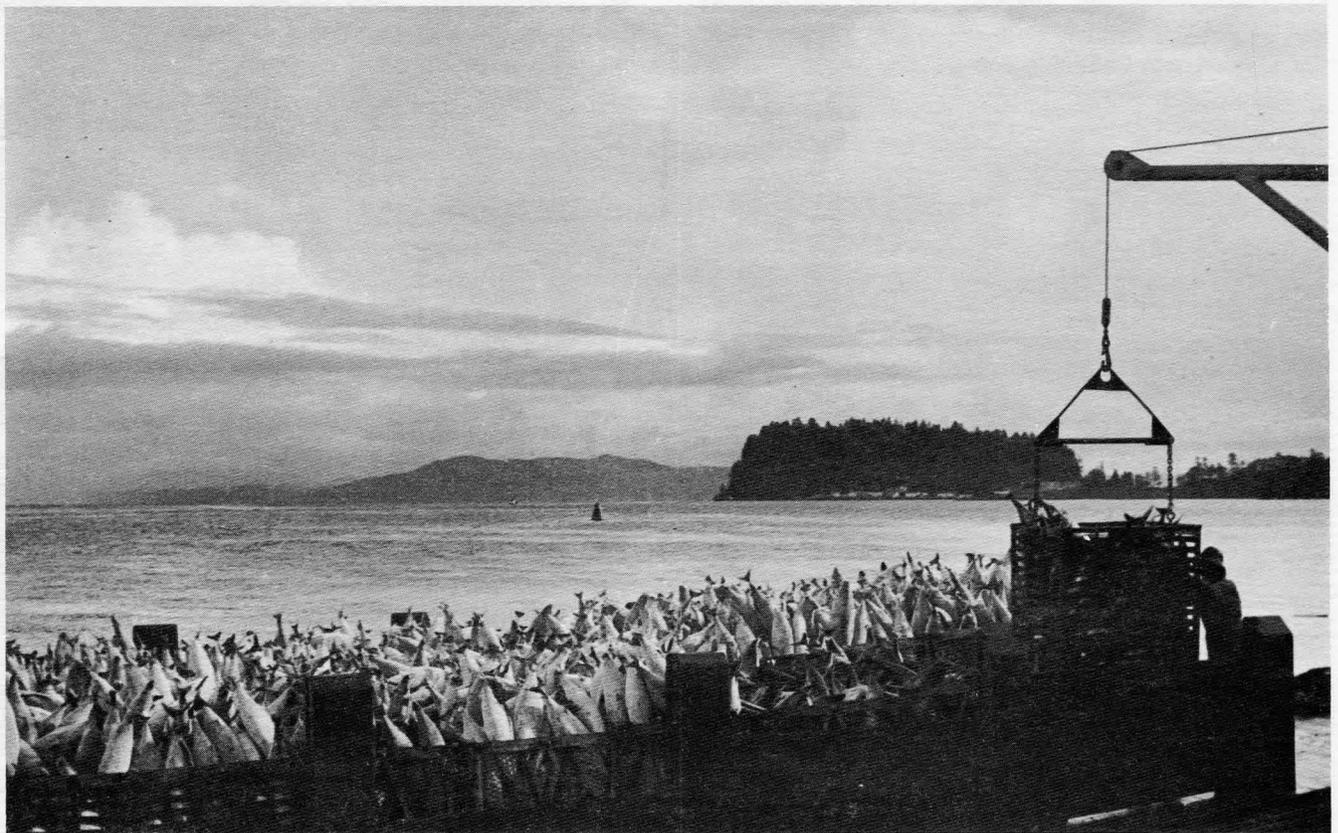
Senate Bill 196 did not pass. This bill was introduced at our request by the Senate Fish and Game Committee. It was aimed at permitting the harvest of surplus hatchery fish by authorizing the commission to open areas in the Columbia River around the mouths of selected hatchery streams to commercial fishing.

In the fall of 1967 alone, more than 147,731 fish surplus to hatchery requirements returned to our

hatcheries. With the continued improvement of hatchery production and construction of new facilities, this overabundance of returning adults escaping all sport and commercial fisheries is expected to increase in the future.

Certainly the preceding comments touch only briefly on some of the highlights of our department's activities during the 1966-68 biennium. We are encouraged that we have witnessed the resolution of many problems during the past two years, and are optimistic that unresolved and new problems faced during the coming biennium will be met with increasing success. Just as a house is built of individual bricks and mortar, comprehensive natural resource management is the product of individual successes and aggressive prosecution of new and existing problems.

During the 1966-68 biennium the department and the fisheries resource benefited substantially from the dedicated council of Commissioners Meierjurgan, Huffschtmidt and Hall. Herman Meierjurgan and Leonard Hall retired from the commission during the biennium each after serving the needs of the resource well for a number of years. With the retirement of Meierjurgan, Commissioner Huffschtmidt became chairman, and McKee Smith of Portland was appointed to the commission. Joseph Eoff of Salem was appointed to replace Leonard Hall. Guidance from these able men will be the foundation upon which the department will base its accomplishments in the coming years.



Frozen albacore tuna are shipped in and unloaded at Astoria for the expanding Oregon market.

COMMISSION REGULATORY ACTION

A major function of the Fish Commission is the establishment of effective regulations to protect, enhance, and perpetuate Oregon's food fish resources. The commission, prior to the adoption of any such regulation, is required by law to hold a public hearing.

At each meeting, appropriate personnel are called on to present their staff's management recommendations based on the biological status of the stock under consideration. Comments from interested persons are invited in writing or from the audience at the hearing and all recommendations are considered by the commissioners before action is taken.

During the biennium, the Oregon Fish Commission was called to order on 34 occasions, 24 of which were joint hearings with the Washington Department of Fisheries regarding commercial fishing in the Columbia.

One notable action occurred at a joint hearing on June 14, 1968 when all shad fishing in the Columbia was ended to insure against any further harvest of certain reduced salmonid stocks. This, as other more and more restrictive regulation, resulted primarily from the increasingly complex problems created by hydroelectric development.

Due to this continued encroachment by man, the declining run of upriver spring chinook was fished upon commercially for only 10¼ days in 1967, and the season was again cut in 1968 to 5 days, the shortest spring fishery on record. In addition to a small run, a factor in reducing the 1968 season was the malfunction of a major fishway and incomplete passage facilities at mainstem Columbia dams.

Also significant through the 1966-68 biennium was the continuation of the commercial fishing summer closure which began in 1965 to protect the summer runs of upriver chinook. Since, a decline in upriver steelhead stocks has also become a reason for the closure.

Another area of concern on the Columbia has been the unregulated Indian fishery. However, following the U. S. Supreme Court's decision upholding Washington State's right to regulate off-reservation fisheries when necessary for conservation (*Puyallup vs. Washington*), the Oregon Fish Commission established a sockeye season above Bonneville Dam. This action provided for an orderly managed Indian fishery for the first time since 1957.

Less controversial, but significantly, the recently developed Youngs Bay coho fishery recorded all-time high catches, allowing the commission to continue the season permitting these otherwise unharvested Klaskanine hatchery fish to be caught.

In other areas of responsibility, the commission adopted, for the first time, a 48-day summer closure on razor clams. The restriction has successfully improved the quality of the clams and reduced wastage. Another measure established a uniform minimum commercial crab size of 6¼ inches.

A Fish Commission abalone planting program was the reason for making Whale Cove off limits to the taking of shellfish, while two other closures, the petrale winter season and the closure of Seaside Cove to commercial clamming, were removed.



During the biennium, the Oregon Fish Commission was called to order on 34 occasions, 24 of which were joint hearings with the Washington Department of Fisheries.

ADMINISTRATION DIVISION

The administration division provides general supervision and coordination over the activities of the Fish Commission's operating divisions.

The division specifically includes fiscal, records, license and statistics, purchasing and property control, and secretarial and clerical activities.

The information-education section, water resources section, federal aid coordinator and personnel officer are included in the administration division for organizational purposes; however, each of these functions is under the direct supervision of the assistant state fisheries director.

The agency had 199 permanent employees when the biennium ended on June 30, 1968. Of these, 27 were working in administration, 18 in engineering, 79 in fish culture, and 75 in research.

The budget for the 1966-68 biennium was approximately \$7.2 million, derived from four sources: state general fund, \$2.7 million; federal funds, \$3.9 million; donated funds from private companies or other agencies, \$293,000; and salmon-steelhead tag share, \$284,000.

INFORMATION-EDUCATION SECTION

The Information-Education Section is the commission's line of communication with the citizens of Oregon.

Through this medium, the commission encourages



A marine and fish life learning session for Oregon School for the Blind students at Camp Magruder was a most memorable experience for participating Fish Commission personnel.

public appreciation for and participation in harvesting the natural resources under its jurisdiction.

The section's ultimate objective is to create and perpetuate public understanding of the vital role of Oregon's fishery resources and related land, water, esthetic and human resources in preserving and enhancing Oregon's livability.

Various techniques are used to prosecute this broad objective, including state-wide news releases; public appearances before conservation, professional, industrial, civic and school groups; television and radio interviews; preparation of brochures and other printed materials; providing still photographs for newspapers and other publications; providing movie footage for television news reports and documentaries; liaison with related natural resource agencies; answering daily telephone and written requests for information; creation of displays; and general press and public relations work as the commission's official representative.

WATER RESOURCES SECTION

As demands on the water resources of the state continue to grow, it becomes increasingly essential to assure fish life is given proper consideration in planning water use.

The Water Resources Section is charged with solving fishery conflicts resulting from water and land uses affecting the state's rivers, bays, and offshore waters. It is involved with the protection of all fish species under jurisdiction of the Fish Commission, including anadromous, food, and shellfish, and intertidal animals. The section has responsibility for: (1) achievement of anadromous fish passage at dams in state and interstate waters; (2) mitigation of fishery losses and enhancement of fishery values at water projects; (3) resolution of fishery problems due to water pollution, river and harbor improvements, gravel removal, flood control projects, logging and lumbering operations, highway and bridge construction, submarine blasting, chemical pesticides, mining, water diversion, and water appropriations; (4) conduct of research to determine flow needs for fish migration, spawning, and rearing; (5) fulfillment of the commission's Willamette Basin Review and Columbia-North Pacific Study responsibilities; (6) representation on several interstate technical committees; (7) fulfillment of the commission's responsibilities relative to formulation of the State Water Resources Board's water-use programs; (8) promotion of legislation to conserve fish and fish habitat; and (9) resolution of fishery problems resulting from nuclear power plant development.

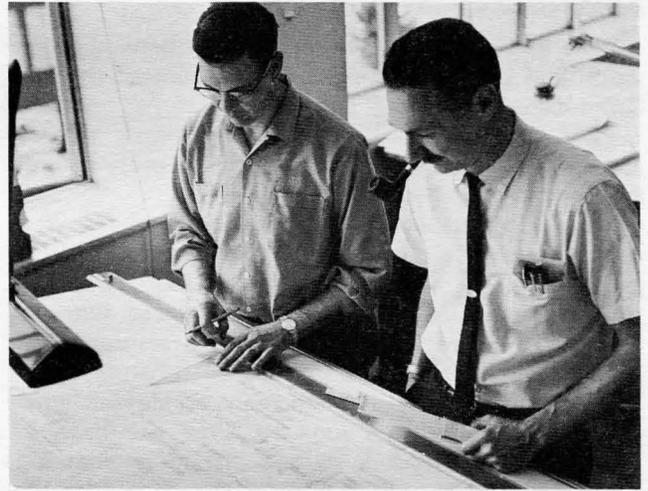
During the biennium, emphasis was placed on strengthening programs to investigate and resolve pollution-related fishery problems, to evaluate fishery problems from impending nuclear power plant development, to resolve fish passage problems at dams, and to advance techniques for attaining fishery mitigation and enhancement at water development projects.

ENGINEERING DIVISION

Headquartered in the Portland administrative offices of the Fish Commission, the engineering division provides the agency with a variety of technical services, including planning, construction, maintenance, repair, project supervision and inspection. In addition, the division provides advisory services to other agencies or private interests on projects involving fisheries.

The following is a summary of the major engineering projects in which the division was involved during the biennium:

PROJECT	REMARKS
1. Big Creek Hatchery water supply system for experimental facility Cost \$12,304	Installation of spring-water collecting box and 6-inch pipeline for research installation. Completed November 1967
2. Bonneville Hatchery paving Cost \$5,850	Paving in vicinity of holding ponds and residential area. Completed July 1967
3. Cascade Creek fishway Cost \$17,853	Planning and construction of fish passage facility on this Five Rivers tributary. Completed August 1967
4. Elk River Hatchery Construction Cost—	Work started February 1968. Scheduled for completion during fall 1968
(1) main hatchery facilities \$352,890	
(2) three dwellings \$49,839	
5. Fish Disease Laboratory, Corvallis Cost \$27,500	Contract awarded June 25, 1968. Scheduled for completion October 1968
6. Klaskanine Hatchery adult holding facility Cost \$13,477	Completed July 1966
7. North Nehalem Hatchery construction Cost—	Work started April 1966
(1) main hatchery facilities \$292,418	Completed October 1966
(2) three dwellings \$48,733	Completed November 1966
(3) North Nehalem Hatchery rearing ponds \$61,928	Expansion of rearing facilities. Addition of water supply pump and 6 new rearing ponds. Completed May 1967
(4) North Nehalem Hatchery concrete curbs, patios, miscellaneous pipe work \$5,625	Completed July 1967
(5) North Nehalem Hatchery asphalt paving \$10,716	Completed November 1967
(6) North Nehalem Hatchery dwelling \$18,450	Fourth house for hatchery personnel Completed May 1968
8. Nutrition building, Clackamas Lab Cost \$58,612	Major construction by private contractor. Finish work by Fish Commission crew. Completed June 1968
9. Review planning and consultation with landowners on required fish passage facilities.	Fishhawk Creek Dam; several projects on North Santiam; and 133 road construction projects, 44 of which involved fish passage.
10. Sandy Hatchery water supply pipeline Cost \$35,041	New primary water supply line Completed November 1967
11. Willamette Falls fishway — Phase A Cost \$796,562	Construction of new cul-de-sac leg of new Willamette Falls fishway. Completed April 1967
12. Willamette Falls fishway — Phase B Cost \$677,630	Construction of fishway exit structure. Completed May 1968
Total Cost of Projects — \$2,485,428	



Ed Neubauer, Fish Commission Director of Engineering, and Russ Coffman check one more time—just to make sure.



It's salmon feeding time at the commission's new North Nehalem hatchery.

In Oregon there are hundreds of miles of prime spawning and rearing stream going unused by salmon and steelhead because of effective barriers to upstream migration posed by logjams. Some of these obstructions are relatively new in origin while others have existed a half century or more. Under the ever increasing pressure of our burgeoning civilization, each section of salmon producing stream becomes ever

more valuable for its role—actual or potential—in maintaining salmon and steelhead runs.

On this basis, as in the past, substantial effort was devoted during the biennium to stream clearance.

Projects were conducted by private contractors under agreement with the agency as well as force account jobs conducted by Fish Commission work crews.

The following is a summary of the major logjam removal activities for the period, shown separately by contract and force account:

Location	Number of jams	Cost of Clearance	Spawning and/or rearing area opened
Contract			
Bark Shanty Creek, tributary of Trask River	2	\$ 1,650	2
Cherry Creek, tributary of Coquille River	1	350	3
Cronin Creek, tributary of Nehalem River	4	1,800	4½
Dewey Creek, tributary of Siletz River	2	1,250	1½
Drift Creek, tributary of Siletz River	1	2,450	1½
Johnson Creek, tributary of North Fork Smith River	7	3,940	13
Roy Creek, tributary of Nehalem River ..	1	1,200	1¾
Steel Creek, tributary of Coquille River	3	318	6
Total	21	\$12,958	33¼

Location	Number of jams	Cost of Clearance	Spawning and/or rearing area opened
Force Account			
Bills Creek, tributary of South Fork Trask River	1	\$ 700	1½
Cedar Creek, tributary of Siletz River	1	980	3½
Clear Creek, tributary of Kilches River	1	1,500	3
East Fork of South Fork Trask River	1	900	2
Elk Creek, tributary of Coquille River	1	280	1½
Elk Creek, tributary of Wilson River	1	950	1
Fall Creek, tributary of Alsea River	1	180	4
Fall Creek, tributary of Wilson River	1	870	¾
Fishhawk Creek, tributary of Nehalem River	6	5,208	8
Fox Creek, tributary of Wilson River	1	720	2
Gold Creek, tributary of Trask River	1	680	2
Oak Ranch Creek, tributary of Nehalem River	3	1,200	6
Short Sands Beach Creek	1	200	3
Total	20	\$14,368	38¼ miles
Contract & Force Account			
Totals	41	\$27,326	71½ miles



Removal of logjams such as this one in the Trask River System opens needed spawning and rearing areas to salmon.

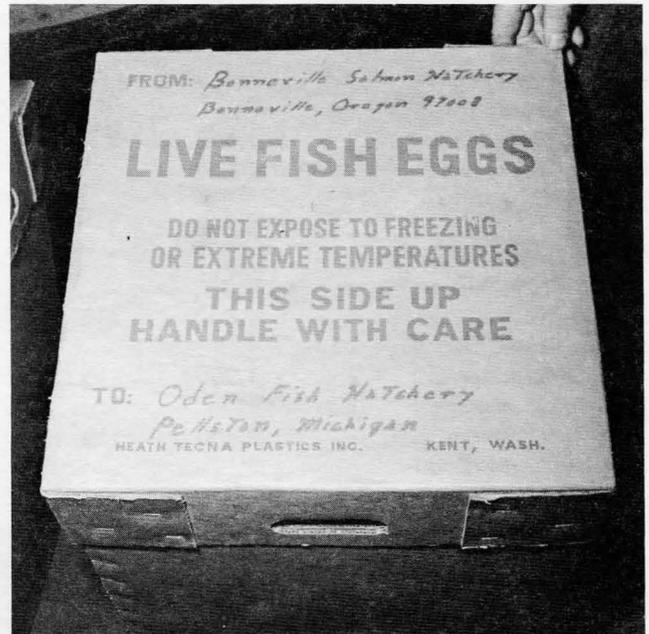
FISH CULTURE DIVISION

The biennium has been one of continued high production at the fifteen Fish Commission hatcheries. The general upgrading in hatchery practices, started some years ago, continued through this report period.

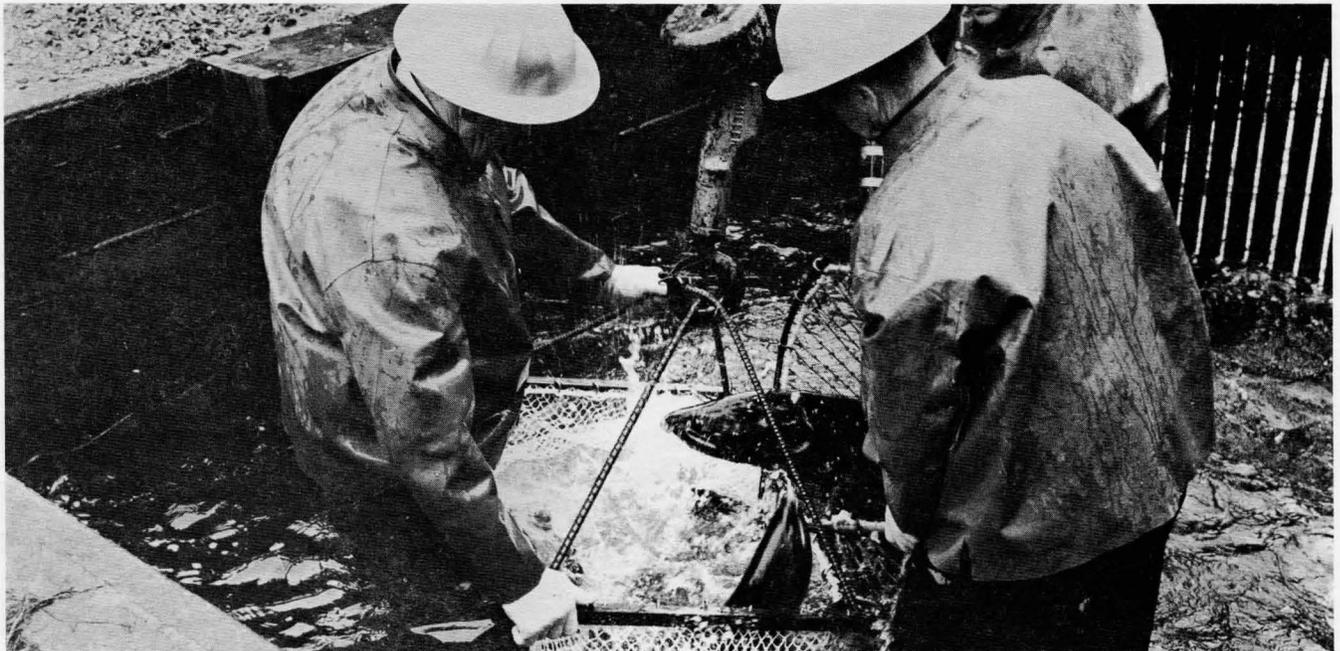
After testing at the Trask Hatchery, rearing ponds of the recently developed Burrows (Fish & Wildlife Service) design were built as part of the new North Nehalem and South Santiam hatcheries. Ponds of this type will also be built at the Elk River station which was under construction as the biennium ended.



Against increasing odds, a summer-run chinook salmon crosses the counting board at a Columbia River dam.



Increasingly large quantities of coho eggs are being air-freighted to many states following the success of Michigan's coho plant.



Adult coho salmon at Alsea hatchery are loaded for hauling to build up natural spawning areas currently understocked or unutilized.



Ouch!? Nope, fin-clipping young is just a method of "marking" fish. It doesn't hurt, but identifies origin.

Burrows ponds at the Nehalem Hatchery, jack coho salmon returned at a higher rate than those reared in conventional ponds.

In addition to the production of a better quality fish, the Burrows ponds have other advantages over conventional rectangular ponds. They are practically self-cleaning with no buildup of excrement and other debris in the ponds. Since the environment is better, there is reduced chance for disease. The healthier fish are more disease resistant. Food can be distributed more evenly by the good flow conditions in the ponds.

Improved feeding techniques, essentially better timing of feeding, has resulted in larger, more uniform-sized hatchery fish. One result of this improvement has been the progressively larger size of hatchery-reared fall chinook smolts during recent seasons. For the past three years, all fall chinook have averaged 100 fish per pound or larger compared to 200-300 fish per pound in previous years. Larger size at time of release should improve survival rates. Food conversion rates—pounds of food to produce a pound of fish—have also been substantially improved during the past several years.

As a result of progressively better fish cultural practices, coupled with good ocean survival conditions, salmon continued to return to commission hatcheries in numbers far in excess of fish cultural requirements. Substantial numbers of these surplus spawners have been transported from Fish Commission hatcheries, fre-

quently with the assistance of men and equipment from the Oregon Game Commission and the U. S. Fish and Wildlife Service. They are taken to natural spawning areas currently understocked or unutilized by salmonids because of stream barriers or for other reasons.

The numbers of adult salmon or steelhead transported from the hatcheries for natural spawning are shown below:

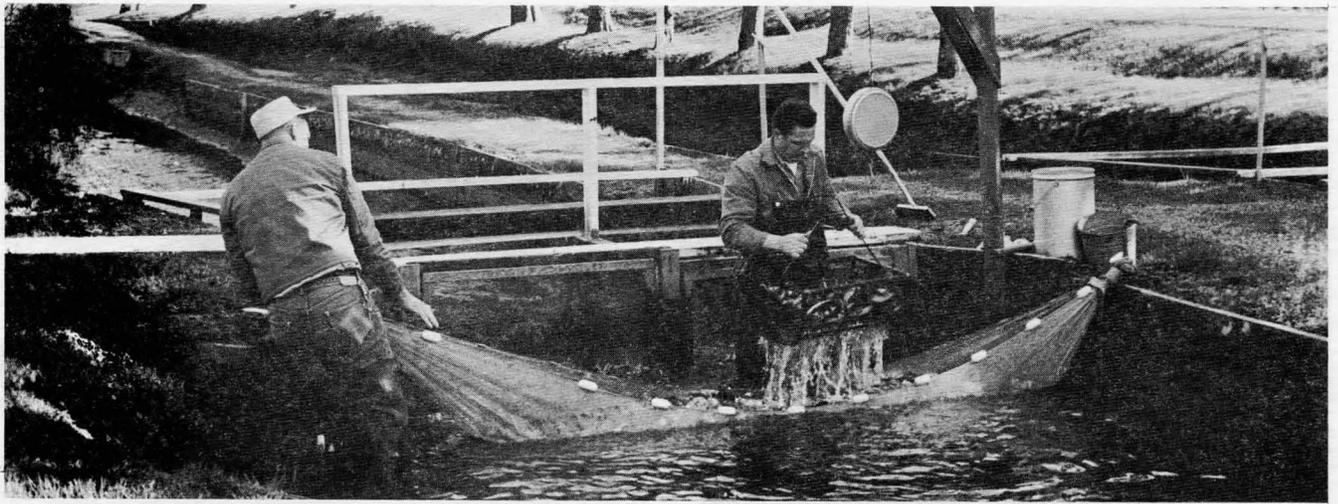
	Calendar Year			
	1964	1965	1966	1967
Coho	38,185	30,887	23,342	27,541
Spring Chinook ...	-0-	-0-	-0-	3,960
Steelhead	3,938	2,894	5,119	9,715

Salmon and steelhead sufficient to "seed" streams above the hatcheries are allowed to pass hatchery racks to take advantage of available natural spawning and rearing areas upstream.

Eggs have been incubated at Fish Commission hatcheries in numbers well above the rearing capacity of the stations and the surplus fry released into Oregon waters. Large quantities of eggs have also been distributed to other conservation agencies, both state and federal. These are shown below:

Agency	1966			
	Fall Chinook	Spring Chinook	Coho	Steelhead
Alaska			1,200,000	
Australia	50,000			
Bureau of Sport Fisheries & Wildlife		1,747,000	9,488,880	76,000
California			1,450,000	
Colorado			75,000	
Idaho			800,000	
Michigan			1,200,000	
Montana			190,000	
Nevada			100,000	
Oregon Game Commission	1,902,480	28,717	2,309,000	472,040
Oregon State University			24,000	
Washington			1,110,000	
Washington Department of Fisheries	3,300,500			
Total	5,252,980	1,775,717	17,946,880	548,040

Agency	1967			
	Fall Chinook	Spring Chinook	Coho	Steelhead
Alaska			550,000	
Bureau of Sport Fisheries and Wildlife	2,595,000		3,455,000	366,100
California			1,050,000	
Colorado			100,000	
Federal Water Pollution Control Administration			12,000	
Idaho			3,120,500	
Michigan			104,000	
Minnesota			200,000	
Montana			285,000	
New York			100,000	
Oregon Game Commission	1,700,000	85,120	1,414,000	1,310,088
Washington Department of Fisheries	6,200,000	2,210,000		
Total	10,495,000	2,295,120	10,390,500	1,676,188



Weigh out time at one of the Fish Commission's 15 hatcheries means these young coho will soon have to fend for themselves.

Substantial numbers of good quality fish carcasses are provided to state institutions. We provided 113,000 and 116,700 pounds respectively in the two years. Those not otherwise disposed of are contracted for sale to the highest bidder. We sold 524,698 pounds in 1966 and 113,724 fish in 1967. In 1967 we changed our disposal procedure and sold by the fish instead of by the pound.

More than 500,000 sockeye salmon eggs were obtained from the Adams River, British Columbia with the cooperation of Canadian authorities. After rearing at commission hatcheries, the young fish were introduced into selected reservoirs in a project designed to evaluate the potential of Oregon impoundments for rearing this species.

A new 10 pond hatchery on the South Santiam River below Foster Dam was completed in March, 1967. The hatchery, built with federal funds, has a capacity of 300,000 spring chinook and 80,000 steelhead smolts. The hatchery was built to replace a hatchery flooded by the reservoir of Foster Dam. Seven of the 10 ponds were built as partial mitigation for losses to the fishery resource by construction of the Green Peter and Foster Dams.

The long discussed hatchery on the south coast moved closer to reality as construction of Elk River Hatchery near Port Orford in Curry County was well under way as the biennium ended. Anadromous Fish Act (P. L. 89-304) funds and general funds were used on a 50:50 basis.

In a program backed by the U. S. State Department and the Bureau of Commercial Fisheries, two Korean fish culturists, Mr. Chun and Mr. Kim, spent six weeks of a fish culture training tour of the United States at Oregon Fish Commission hatcheries. Fish culture director Ernest R. Jeffries spent a month in South Korea as part of a three-man team surveying east coast rivers to evaluate their potential for salmon production and to select possible hatchery sites. In a follow-up of this program, the commission's engineering

director, Edward K. Neubauer, spent a similar period there as a member of an engineering group preparing plans for hatchery construction. The call by federal authorities on commission technical personnel is recognition of the superior achievement of the individuals and the department in handling modern fish cultural and hatchery engineering problems.

In March, 1968, fish culture director Jeffries was feted by the Michigan State Chamber of Commerce at a Coho Victory Celebration in Detroit for the role he and his staff played in providing Michigan biologists with technical advice and the initial 1.0 million coho eggs in 1964 that resulted in a phenomenal success in establishing the species in Lake Michigan. The introduction is certain to go down in conservation annals as one of the most spectacularly successful efforts of its kind. Michigan's program is continuing with 1.0 million coho eggs received from Oregon in 1965 and 1966, and only 100,000 in 1967. Eggs from their program were available in 1967.

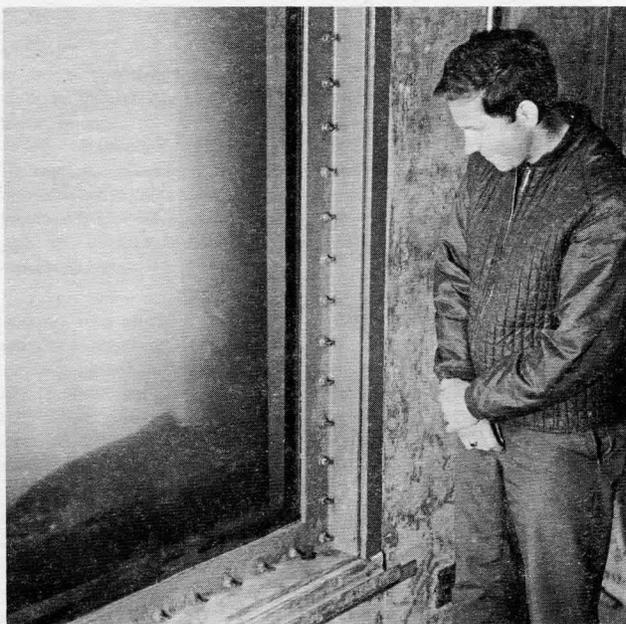
As might be expected, despite continued success in our hatchery program, there have been occasional problems. Record low flows coupled with very high water temperature, for example, brought on complications at a number of stations during the summer of 1967. At Sandy Hatchery, to cite one instance, water temperature reached 70° F each day for a period of several weeks. As a result, columnaris disease became a major factor in skyrocketing mortality of young fish.

At Cascade Hatchery, in February 1968, a storm in the upper watershed of Eagle Creek flushed quantities of debris downstream to plug the main hatchery water supply line. The resulting loss of 950,000 coho yearlings dealt a severe blow to the output at that facility.

Despite such occasional unfortunate occurrences, salmon and steelhead releases continued at a high level during the biennium. The future looks bright for continued good production from Oregon Fish Commission hatcheries.

RESEARCH DIVISION

Studies conducted by the research division provide the basis for scientific management of Oregon's food fish and shellfish resources. The division is headquartered at the Clackamas Laboratory. Field Stations are maintained at Astoria, Brookings, Charleston, Elgin, Newport, Sandy, and Fall Creek and Foster-Green Peter Dams. Other field stations which operated during the biennium, but terminated with the completion of associated projects, included those at Carmen-Smith spawning channel and at Cougar and Pelton Dams.



At Willamette Falls Fishway, a biologist observes spawning-bound migrant passing the modern counting chamber complete with T.V. and video-tape equipment.



Red abalone were jettied in from California for an experimental plant in Whale Cove to determine if they could grow and reproduce.

The following is a summary of research and management projects conducted by the division during the 1966-68 biennium:

MANAGEMENT PROJECTS

Project	Purpose
1. Survey of hatchery techniques (in cooperation with Bureau of Commercial Fisheries)	to evaluate existing methods employed at salmon hatcheries in order to operate Oregon Fish Commission hatcheries at greatest efficiency.
2. Fish food specification and quality control (in cooperation with Bureau of Commercial Fisheries)	to insure that the Oregon Fish Commission is furnished with wholesome, economical and practical fish foods.
3. Disease prevention and/or control in hatchery fish (in cooperation with Bureau of Commercial Fisheries and Corps of Engineers)	to detect and treat fish diseases and to develop and/or recommend preventive and control measures.
4. Troll salmon management (in cooperation with Bureau of Commercial Fisheries)	to obtain data on the troll fishery relative to catch size, composition, distribution, timing and other factors pertinent to management objectives.
5. Monitoring Willamette River anadromous salmonid runs (in cooperation with Oregon Game Commission and Bureau of Commercial Fisheries)	to determine the sport catch in the lower Willamette River and the escapement of spring chinook through the fishway at Willamette Falls and to determine the escapement of steelhead, fall chinook and coho salmon passing through Willamette Falls fishways.
6. Surveys of spawning salmon (in cooperation with Oregon Game Commission)	to establish trends of abundance for spawning salmon in Oregon.
7. Inventory surveys of Oregon coastal streams (no cooperating agency)	to assess the value of streams for spawning and rearing of salmon and to locate fish passage obstructions.
8. Hatchery site evaluation (in cooperation with Bureau of Commercial Fisheries)	to evaluate known potential hatchery sites and to explore coastal lakes and streams for additional potential hatchery sites.
9. Management of Columbia River commercial fishery (in cooperation with Washington Department of Fisheries)	to regulate the Columbia River commercial fishery to obtain maximum sustained yield from the resource.
10. Albacore tuna study (no cooperating agency)	to monitor the landings of albacore in Oregon fishery and collect information on the life history, behavior and environment of the albacore.
11. Management of the Oregon trawl fishery (no cooperating agency)	to monitor and regulate the fishery to obtain optimum sustained yield and prevent exploitation.
12. Management of Oregon Dungeness crab resource (no cooperating agency)	to regulate the commercial and personal-use fishery to obtain optimum sustained yield.
13. Management of the Oregon shrimp fishery (no cooperating agency)	to monitor and regulate the fishery to obtain maximum sustained yield.
14. Management of Oregon's clam, oyster, abalone and intertidal animal resources (in cooperation with Bureau of Commercial Fisheries)	to monitor the harvest of shellfish resources and determine the status of the stocks.



Wahkeena Pond, a fresh-water natural rearing impoundment, proved to be a highly successful method of rearing fall chinook and coho through supplemental feeding.

RESEARCH PROJECTS

- | Project | Purpose |
|---|--|
| 1. Spring chinook salmon ecology study (no cooperating agency) | to study production and ecology of spring chinook salmon in an eastern Oregon stream (Looking-glass Creek). |
| 2. Analysis of salmonid scales (no cooperating agency) | to determine age of salmon and steelhead by analysis of scale samples. To identify different races of salmon and steelhead in the Columbia River. |
| 3. Study of rearing juvenile salmon in fresh-water impoundments (in cooperation with Bureau of Commercial Fisheries and Regional Parks & Recreation Agency) | to determine the natural rearing potential of representative impoundments in Oregon and to determine the increased production of impoundments through fertilizing the water or feeding fish. |
| 4. Evaluation of fall chinook and coho salmon production at Columbia River hatcheries and coho production in coastal hatcheries (in cooperation with Bureau of Commercial Fisheries, Alaska, Washington, California and British Columbia) | to obtain an estimation of the production and harvest of fall chinook and coho salmon reared in Columbia River hatcheries and coho reared in Oregon coastal hatcheries. |
| 5. Population estimates of juvenile coho salmon in six coastal streams (in cooperation with Bureau of Commercial Fisheries) | to determine if annual fluctuations in abundance occur in juvenile coho populations and if the abundance can be related to parent abundance, returning adults, and environmental conditions. |
| 6. Determination of the feasibility of introducing sockeye salmon into reservoirs (in cooperation with Bureau of Commercial Fisheries) | to determine the ability of juvenile sockeye to survive, rear in and emigrate from certain reservoirs. To catalog reservoirs in Oregon as to their physical, chemical, and biological properties. To evaluate these with respect to their potential for rearing sockeye. |

Project

7. Evaluation of fish facilities and passage at Fall Creek Dam (in cooperation with Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife and U. S. Army Corps of Engineers)
8. Evaluation of fish facilities and passage at Green Peter and Foster Dams (in cooperation with U. S. Army Corps of Engineers, Oregon Game Commission, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries & Wildlife)
9. Evaluation of fish facilities and passage at River Mill and Faraday Dams (in cooperation with Portland General Electric Co., Oregon Game Commission, Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife)
10. Investigation of the abundance and recruitment of bottomfish off Oregon (in cooperation with Bureau of Commercial Fisheries)
11. Study of the distribution and abundance of pink shrimp in the Pacific Ocean off Oregon (in cooperation with Bureau of Commercial Fisheries)
12. Investigation of methods of spawning and rearing oyster and clam larvae (in cooperation with Bureau of Commercial Fisheries and Oregon State University)

Purpose

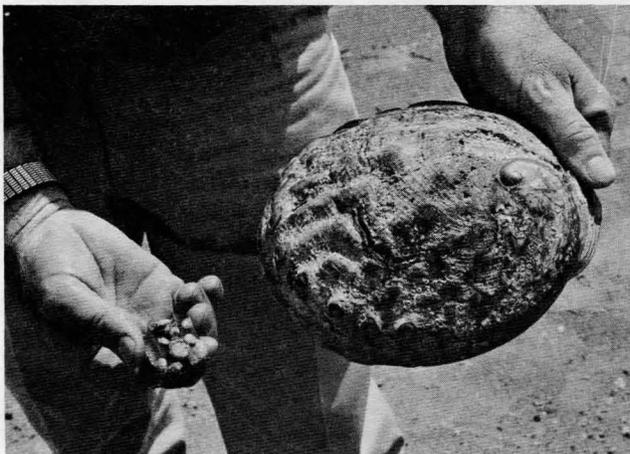
- to evaluate the efficiency of facilities for the collection of upstream and downstream migrants, and the effect of the reservoir on juvenile anadromous salmonids.
- to evaluate the efficiency of facilities for the collection of upstream and downstream migrants and the effect of the reservoirs on juvenile anadromous salmonids.
- to evaluate the effectiveness of the fish passage facility at River Mill Dam for passage of adult anadromous salmonids. Determine the numbers of juvenile anadromous salmonids diverted into Faraday Lake and the extent of mortalities incurred by passage through the Faraday powerhouse.
- to evaluate existing data on fluctuations in abundance and year class strength of Dover, English, and petrale soles and Pacific ocean perch. Develop techniques to determine spawning success, year class strength and abundance.
- to determine the horizontal distribution and abundance and the vertical distribution and migration of pink shrimp and the environmental factors which may influence these movements.
- to develop techniques for spawning clams and oysters in the laboratory and rearing the larvae. Project includes identifying algae which can be used to feed larvae.



Test fishing on the Columbia River helps to determine exact timing and status of various runs.

RESEARCH PROJECTS—Continued

- | Project | Purpose |
|--|---|
| 13. Investigation of factors influencing survival of Dungeness crab larvae (in cooperation with Bureau of Commercial Fisheries) | to determine methods of rearing crab larvae and to challenge larvae with varying degrees of salinity, temperature to determine possible sources of mortality. |
| 14. Fish quality studies (in cooperation with Bureau of Commercial Fisheries) | to identify characteristics of hatchery-produced juvenile Pacific salmon and steelhead which are related to survival to adulthood. To establish quality standards for hatchery fish. To determine the techniques of artificial propagation affecting production of high quality fish. |
| 15. Quantitative genetics study of the heritability of characters in coho salmon (in cooperation with Bureau of Commercial Fisheries and Oregon State University) | to define breeding schemes for coho salmon which will result in the most rapid and economical improvement of hatchery stocks of that species. |
| 16. Infectious disease of salmonid fishes (in cooperation with Bureau of Commercial Fisheries and Oregon State University) | to obtain information required to prevent or control specific diseases of fish. |
| 17. Salmonid nutrition research and diet development (in cooperation with Bureau of Commercial Fisheries and Oregon State University) | to develop nutritionally sound, economical, practical diets for hatchery-reared Pacific salmon and steelhead. |
| 18. Barbless hook evaluation (in cooperation with Bureau of Commercial Fisheries) | to determine the value of barbless hooks in decreasing mortality of undersized or otherwise unwanted salmon taken in troll fishery. |
| 19. Relationship of the scale patterns of adult salmon returnees with juveniles released from Oregon Fish Commission hatcheries (in cooperation with Bureau of Commercial Fisheries) | to develop the technique of identifying hatchery and naturally-produced fish by scale patterns. |
| 20. South coast salmon ecology study (in cooperation with Bureau of Commercial Fisheries) | to investigate the ecology of salmon, particularly fall chinook, in streams and lakes on the southern Oregon coast. |



Baby and adult red abalone are researched by Fish Commission personnel at Newport.



This new laboratory, the latest addition to the Clackamas research facility, is being used for nutrition studies.

- | Project | Purpose |
|--|--|
| 21. Use of the radionuclide Zn 65 to identify origin of coho salmon in the ocean catch (in cooperation with Bureau of Commercial Fisheries, Oregon State University, Fisheries Research Institute, Fisheries Research Board of Canada) | to evaluate Zn 65 as "natural" tag on coho from Oregon and Washington. Juveniles pick up Zn 65 in the food they eat while passing through the Columbia River plume. The radionuclide originates at the Hanford installation on the Columbia. |
| 22. Shad and striped bass population study (in cooperation with Bureau of Commercial Fisheries) | to estimate the population of shad and striped bass in southern Oregon streams and to relate populations to harvest rates. |

The following projects were completed during the biennium:

- | Project | Purpose |
|--|---|
| 23. Round Butte evaluation project (in cooperation with Portland General Electric, Bureau of Sport Fisheries and Wildlife, Bureau of Commercial Fisheries, and Oregon Game Commission) | to determine the efficiency of both upstream and downstream passage facilities at Round Butte Dam on the Deschutes River. |
| 24. Carmen-Smith spawning channel (in cooperation with Eugene Water and Electric Board, Bureau of Sport Fisheries and Wildlife, Bureau of Commercial Fisheries, and Oregon Game Commission) | to evaluate use of an artificial spawning channel by spring chinook salmon and to refine techniques of operating a facility of this type. |
| 25. Cougar Dam fish passage evaluation study (in cooperation with U. S. Army Corps of Engineers, Bureau of Sport Fisheries and Wildlife, Bureau of Commercial Fisheries, and Oregon Game Commission) | to evaluate the adult collection and transportation and downstream passage facilities at Cougar Dam. To investigate the behavior of juvenile salmonids in reservoirs. |
| 26. Imnaha study (in cooperation with Pacific Northwest Power Company) | to investigate the behavior of juvenile salmonids relative to possible effects of the proposed High Mountain Sheep Dam. |

LONG RANGE GOALS

To provide for optimum utilization, consistent with perpetuation of the species, of all food fish, shellfish and intertidal animals within the waters of the state.

A. Propagation

To produce, as efficiently as possible, in natural and artificial environments, the maximum quantity of highest quality fish to satisfy increasing public demand for food fish and recreation.

B. Habitat Improvement and Protection

To foster maximum production of desired fish and shellfish through the creation of new, and improvement of existing, fishery habitats. To protect fish resources by determining potential damages from environmental change and by preventing damage or recommending methods to minimize damage; and by providing data to the State Water Resources Board for the development of state water policies which will assure favorable provision for needs of fishery resources.

C. Management and Regulation

To provide optimum utilization, consistent with the perpetuation of the food fish, shellfish and intertidal animal resources by developing and administering appropriate regulations.

D. Information and Education

To provide information to the general public on fish resources programs, and to encourage participation in the harvest and utilization of the food fish of Oregon by the public and the fishing industry. To inform all segments of the public on the needs of the resource and to encourage action consistent with satisfying these needs.

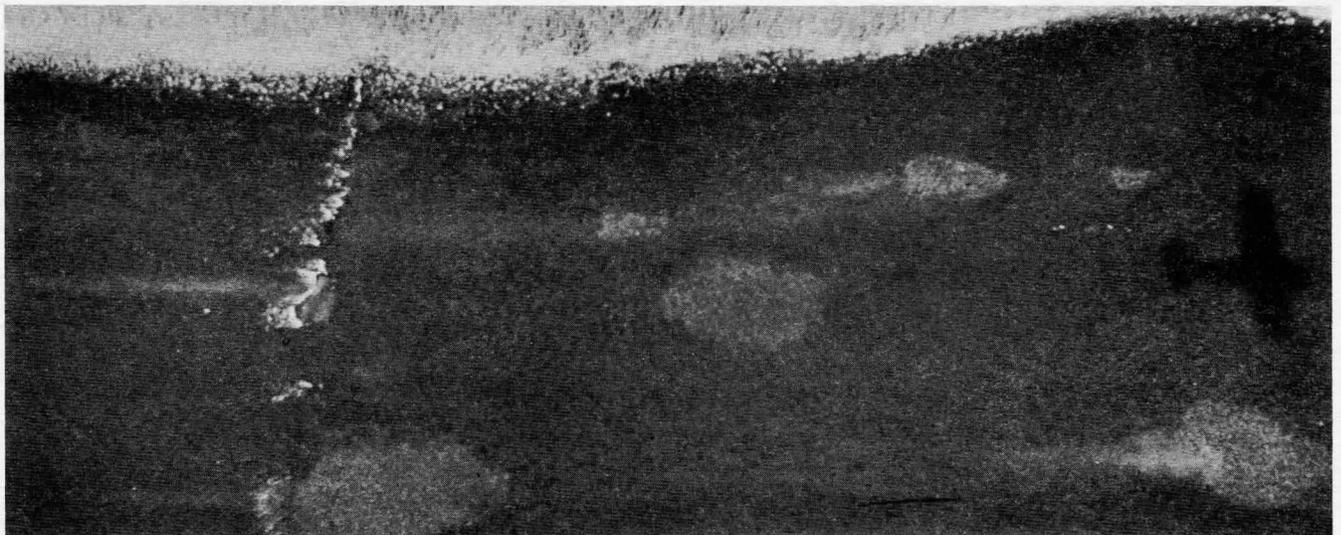


Roy Sams, the Fish Commission's "pond" man, explains his pet project to a school group during weigh out time for the young fingerling salmon at the Commission's new Salem Park pond.

E. Research and Development

To insure efficient management of Oregon's fish resources through the development, evaluation and improvement of research relating to the various species and their environment.

To maximize the utilization of fish resources by development of new products and new uses of food fish; and by encouraging and initiating the use of undeveloped or under-utilized stocks.



Shadow of plane falls on the glistening waters of the Molalla River during spawning ground surveys. Fall chinook spawning beds (redds) are the light circular areas.

ACTIVITIES NECESSARY TO ACCOMPLISH LONG-RANGE OBJECTIVES

I. Salmon and Steelhead

A. Natural Production

With spawning, rearing and watershed areas being progressively blocked, inundated, polluted, denuded, and devastated, it is important that there be an immediate increase in Fish Commission activities directed toward prevention of further damage, and rehabilitation of areas no longer productive.

Activities to accomplish this include:

1. Improve habitat to increase the quality and quantity of natural rearing areas.
2. Study predator-prey relationships in rearing areas with a view to possible control measures if indicated.
3. Investigate environmental conditions and predator populations in streams which smolts travel from rearing areas to the ocean.
4. Conduct studies of predator control measures adaptable to forays of impoundments in the Columbia River.
5. Study upstream and downstream migrant salmonid losses at dams with the goal of modifying dams to improve passage.
6. Design gear to collect large numbers of downstream migrants in bays or large rivers to determine where mortalities occur as an aid in planning protective measures.
7. Define ocean migration routes of salmon and steelhead and determine natural and fishing mortalities in the ocean.

B. Artificial Propagation

1. Coastal Hatcheries

To provide adequate stocks of salmon for the expanding fisheries, there should be at least six large modern hatcheries spaced along the coast. This will require expansion of four existing hatcheries and construction of two new ones.

PRESENT AND PROPOSED PRODUCTION (In Millions of Fish)

Hatchery	Coho		Fall Chinook		Spring Chinook	
	Present	New	Present	New	Present	New
North Nehalem	1.4	2.8	1.0	2.0	0.0	0.0
Trask	0.6	2.0	0.5	2.0	0.1	2.0
Siletz	0.5	2.0	0.0	2.0	0.0	0.0
Alsea	1.2	1.6	0.0	1.0	0.0	0.0
Mid-Coast Site	0.0	2.0	0.0	2.0	0.0	0.0
Elk River	0.1	0.2	0.9	2.0	0.0	0.0
Total	3.8	10.6	2.4	11.0	0.1	2.0

Water reuse systems will be necessary at some locations to provide the expansion.

Heating and/or cooling, filtering and sterilization may be required.

At present production and catch rates, it is predicted that the expanded facilities will make possible the increased commercial and sport catches of coho, fall and spring chinook.

ANTICIPATED CATCH AND VALUE TO THE FISHERY

Species	Increase in no. of fish liberated	Increase in adults expected in fisheries	Value per fish ^①	Total estimated value
Coho	6,800,000	306,000	\$3	\$ 918,000
Fall Chinook	8,600,000	32,680	\$7	\$ 252,000
Spring Chinook	1,900,000	60,000	\$8	\$ 480,000
Total	17,300,000	398,680		\$1,650,000

^① Value of fish based on a first wholesale price to commercial fishermen.

Further expansion of rearing facilities by developing five ponds or enclosures in lakes in the coastal area will provide an additional 10 million coho for liberation each year. The result of this program will be an additional 450,000 coho landed in the fisheries each year with a minimum annual value of \$1,350,000.

2. Columbia River Hatcheries

Water reuse systems installed at Bonneville, Cascade, Klaskanine and Sandy Hatcheries will allow rearing fall chinook to a larger size, resulting in an expected minimum increase of fifty percent in the survival rate. This will mean an additional 34,200 fall chinook annually to the fisheries with an estimated minimum value of \$263,000. An additional 2 million coho smolts will add another \$270,000 to the value of the state's fisheries.

With Columbia River hatcheries programmed for full production for the next two years—without hatchery expansion—an additional 2 million coho smolts will be liberated. These will yield at least 60,000 adults to the fisheries, upping the value of the landings by more than \$180,000.

With the development of the water reuse principle, with inclusion of filters and sterilizers, hatcheries can be constructed in areas where limited water supply and/or poor water quality have precluded construction of hatcheries in the past.

3. Willamette River Hatcheries

Construction of two large hatcheries—one for fall chinook on the main Willamette near Corvallis and a spring chinook hatchery on the lower North Santiam—will give a substantial boost to the Willamette runs. Production of 10 million fall chinook at the

main stem facility will provide an additional 38,000 adults to the fishery, and increase annual landing values by \$292,600. Spring chinook production of two million yearlings will provide an additional 60,000 adults to the fisheries, increasing the annual value of the landings by about \$480,000.

Development of five rearing ponds on Willamette River tributaries will produce 25 million fall chinook smolts, yielding 76,000 adult fish to the fisheries for an annual value of about \$585,200.

Three hatcheries now in operation will be maintained and a fourth, the McKenzie station, will be rebuilt. The result will be an increase in spring chinook production of 700,000 smolts, from the present 4.6 million to 5.3 million annually. Steelhead production will be maintained at its present level of 200,000 annually.

4. Other Artificial Propagation Efforts

Attempts will be made to locate and evaluate impoundments to be used as rearing areas for juvenile salmonids. Fish will be fed in these areas and then released to go to the ocean.

Large scale investigations will be conducted on the use of streamside incubators as a means of increasing production of chum and pink salmon.

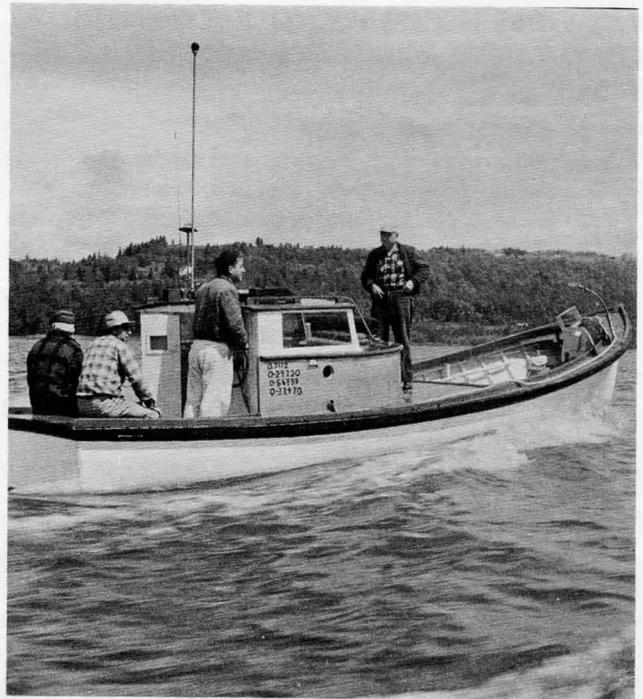
Genetic studies will be launched in an effort to improve the quality of existing stocks. The possibility of developing new strains of salmon adaptable to specific problem locations will also be investigated.

II. Bottom Fish, Pelagic Fish Other Than Salmon, Ocean Shellfish

Management of the bottom fish resource is complicated by a general lack of knowledge. Large stocks of fish exist off the Oregon coast which are either not exploited or are considered underharvested.

In planning for use of these latent resources, there are numerous questions which need to be answered. Some examples include questions on the size of the populations, their migration patterns, the factors associated with recruitment to the fishery, the natural and fishing mortality rates, unusual life history requirements, predator-prey relationships, and the influence of environmental conditions on abundance.

In order to gather the information required to properly manage these resources, it will be necessary to provide a substantial increase in the number of people assigned to studies of these and related matters. At least two large ocean-going vessels will be required to conduct research on the highly valuable marine resources.



"Bowpicker" gillnet boat on the Columbia River.

III. Shellfish (inshore, intertidal, and estuarine)

This resource also needs to be extensively inventoried. An immediate resurvey of all bays, ocean beaches, and subtidal areas near the shore should be launched. A laboratory program is needed to develop artificial propagation techniques and to develop at least one hatchery for stocking shellfish in areas where populations are depressed. This will require a large, modern laboratory facility.

The optimum sustained and economic yields of all populations will be determined and the productive potential of all areas assessed. Future land use will be anticipated and public reserves delineated. Commercial harvest areas will also be assigned for leasing.

The quality of each shellfish area will be evaluated and the most productive reserved for future shellfish production, protected from other developments through appropriate state laws.

The use of warm-water effluents (such as those from nuclear power plants) will be explored for use in oyster production.

IV. A marine laboratory at Newport is needed in the near future to provide adequate facilities for present and future management and research needs of the marine resources.

Acquisition and protection of all essential estuarine environment for shellfish and finfish will be an important consideration.

Also to be developed are offshore reefs for marine fish.

RETIREMENTS

ARCHIE W. ANDERSON

When he retired at the end of March 1967, Bonneville hatchery superintendent Archie Anderson had completed 45 years of service with the Fish Commission. He began his career at the Bonneville station in April 1922, and spent his last 20 years there. During the intervening years, he served at a number of other installations including Ox Bow, South Santiam, and Willamette hatcheries. Archie points with pride to the great strides in hatchery operations during recent years and is happy to have played a part in bringing Oregon fish cultural practices to the high level they are today. He and Mrs. Anderson make their home in Tigard.

CHARLES L. BOROUGH

From July 1, 1959 until his retirement on April 8, 1968, Charlie Borough worked at the Dexter holding pond near Lowell. The installation is operated as part of the Willamette hatchery facility. His duties included general hatchery work and guard at the Dexter site. He plans to continue living at Lowell during his retirement.

MARY D. GOETSCH

For more than 22 years, from November 25, 1945 until her retirement on January 31, 1968, Mary Goetsch worked with the administration division in the Portland office. Starting as a clerk typist, Mary soon became an accounting clerk and later was advanced to Clerk 4. In charge of the secretarial pool, she also worked in the maintenance and processing of personnel records, payroll, and other fiscal duties. Her job contact and her personality made Mary one of the commission's most widely known and liked staff members. Mary plans to continue making her home in Portland.

CLAUDE L. McCOOL

On June 30, 1968, Claude McCool retired after nearly 17 years with the commission's fish culture division: He began work as a hatcheryman at Bonneville. During his time with the department, he also worked at the Marion Forks, Alsea, Cascade and Sandy hatcheries. Originally from Scott City, Kansas, Claude and Mrs. McCool now make their home in Portland.

CHARLES B. STURE

Charley Sture retired on January 16, 1968 after almost 15 years with the fish culture division. He worked the entire time at Big Creek hatchery near Astoria. Prior to his career with the commission, he worked as a logger and a commercial fisherman. Charley and Mrs. Sture will continue making their home near Knappa where they have lived for some years.

OTTO TEUSCHER

Otto started work with the department in December 1956 as a carpenter assigned to a remodeling job at the Clackamas Laboratory. What started as a temporary job became a permanent assignment. His job took him to most commission installations around the state where he became well known and respected for his ability. He retired in January 1967 at the age of 70 with 10 years of service with the commission. A widower, Otto makes his home in Hillsdale, near Portland.

FLORENCE B. WILKIN

A clerk with the commission's research division headquarters at Clackamas, Florence retired at the end of December 1966. She had been with the agency for five years. Originally from Illinois, she and her husband make their home in Milwaukie.



Troll fishing fleet, Astoria, circa 1935.

SUGGESTION AWARDS PROGRAM

The Employees Suggestion Awards Program was established by the 1955 Legislature to encourage and reward state employees for suggestions promoting efficiency and economy in state government. The program was discontinued during the biennium. Prior to its demise, however, three additional awards were granted to commission personnel.

George V. Smalley, Bonneville Hatchery Superintendent, received two additional awards this biennium to bring his total to ten winning suggestions and \$1,070 in cash awards. His two latest suggestions included: (1) Development of a multiple use liberation tank which could also be used in counting smolts quicker than by former methods and with minimum handling of fish brought him a \$200 cash award. (2) A plan to substitute cheaper and equally effective lignasan for malachite green in the disease preventive treatment of hatchery fish, earned him a \$65 cash award.

Denny B. McClary, hatcheryman at Cascade Salmon Hatchery, received \$260 for developing an automatic egg counter to speed up this tedious hatchery chore. The device is being adopted by a number of other agencies.

SERVICE RECOGNITION PROGRAM

In 1960, the Fish Commission inaugurated a program to give recognition to employees with extended periods of public service. Since that time, 119 service pins have been presented.

Sixteen presentations were made during the 1966-68 biennium, representing 190 man-years of service.

20 YEAR SERVICE AWARD

Howard V. Drago
Richard S. Harrison
Robert W. Schoning

10 YEAR SERVICE AWARD

Wayne A. Burck
Delbert R. Hanks
Ronald W. Hasselman
Ralph N. Hesgard
Thomas E. Kruse
David A. Leith
Warren M. Morgan
Edwin L. Niska
Arthur L. Oakley
Daniel B. Romey
Alfred H. Simukka
Otto Teuscher
Emery J. Wagner



George Smalley won a suggestion award for developing a multiple use liberation tank which counts out smolts by the displacement method. In above picture, the tank is being used to transport and release adult coho.

FINANCIAL STATEMENT

SUMMARY STATEMENT OF FINANCIAL TRANSACTIONS OF FISH COMMISSION July 1, 1966 to June 30, 1968

Unexpended balance of funds at beginning of biennium		\$ 104,093.59
Appropriations and Receipts:		
General Fund Appropriations:		
Operation and Maintenance:		
1965-1967 Total Appropriation	\$2,072,666.00	
Less:		
1965-1966 disbursements	\$ 952,282.81	
Reverted to State Treasury	1,338.05	
Reservation for June 30, 1968 obligations	3,144.90	956,765.76
		\$1,115,900.24
1967-1969 Total Appropriation	\$2,516,905.00	
Emergency Board action June 14, 1968	17,966.00	\$2,534,871.00
Less:		
Reduction imposed by Special Session of Legislature	\$ 113,261.00	
Reservation for 1968-1969 expenditures	1,293,664.45	1,406,925.45
		1,127,945.55
Capital Construction:		
1965-1967 New Nehalem Hatchery	\$ 375,000.00	
Less:		
1965-1966 disbursements	\$ 27,903.73	
Amount reverted to State Treasury	270.80	28,174.53
		346,825.47
1967-1969 New Elk River Hatchery (General Fund matching \$226,000 Federal Funds)	\$ 191,000.00	
Less reservation for 1968-1969 expenditures	94,319.88	96,680.12
Total Net General Fund Appropriations for 1966-1968 ..		\$2,687,351.38
Receipts from Other Sources:		
Schedule "A" Fiscal Year 1966-1967	\$2,835,749.32	
Fiscal Year 1967-1968	1,642,752.12	
Total Receipts—Other Sources		4,478,501.44
Total net appropriations and receipts ..		7,165,852.82
Total amount available for expenditures		\$7,269,946.41
Expenditures for period per Schedule "B":		
Fiscal year 1966-1967		\$4,445,252.69
Fiscal year 1967-1968		2,748,662.79
Total expenditures for biennium		\$7,193,915.48
Unexpended balance June 30, 1968		76,030.93

**ANALYSIS OF CASH BALANCE OF FISH COMMISSION FUNDS
AS OF JUNE 30, 1968**

Seal	\$ 5,260.27
Miscellaneous Receipts	8,287.95
Donation	27,029.09
Salmon Management	35,453.62
Total All Funds—June 30, 1968	\$ 76,030.93

SCHEDULE "A"

**STATEMENT OF RECEIPTS OF FISH COMMISSION
July 1, 1966—June 30, 1968**

GENERAL FUND RECEIPTS	Fiscal Year 1966-1967	Fiscal Year 1967-1968	Total for Biennium
Licenses:			
Boat	\$ 41,140.00	\$ 62,320.00	\$ 103,460.00
Buyer	900.00	890.00	1,790.00
Canner, Fish	1,600.00	1,500.00	3,100.00
Canner, Shellfish	250.00	200.00	450.00
Commercial Fishing	56,625.00	88,650.00	145,275.00
Gillnet, Nonresident	1,665.00	3,150.00	4,815.00
Gillnet, Resident	2,215.00	2,765.00	4,980.00
Lost License, Other	56.00	33.00	89.00
Retail	10,870.00	10,180.00	21,050.00
Setnet	625.00	445.00	1,070.00
Single Delivery	5,295.00	5,670.00	10,965.00
Special Permit (carp)	6.00	4.50	10.50
Wholesale	7,400.00	6,850.00	14,250.00
Total license receipts	\$ 128,647.00	\$ 182,657.50	\$ 311,304.50
Other Receipts:			
Poundage fees and interest	\$ 260,237.84	\$ 347,217.18	\$ 607,455.02
Seized and confiscated property sales	726.05	1,856.32	2,582.37
Miscellaneous—all other	5,161.62	17,624.31	22,785.93
Total other receipts	\$ 266,125.51	\$ 366,697.81	\$ 632,823.32
Total General Fund Receipts	\$ 394,772.51	\$ 549,355.31	\$ 944,127.82
Less Transfer to State General Fund	394,772.51	549,355.31	944,127.82
DEDICATED FUND RECEIPTS			
Donation	\$ 120,490.70	\$ 171,929.05	\$ 292,419.75
Salmon Management	135,955.50	148,372.00	284,327.50
Federal Funds	2,577,993.62	1,320,876.07	3,898,869.69
*Seal Fund	1,309.50	1,575.00	2,884.50
Total Dedicated Fund Receipts	\$2,835,749.32	\$1,642,752.12	\$4,478,501.44
* SEAL FUND DETAIL			
Gillnet	\$ 1,105.00	\$ 1,450.00	\$ 2,555.00
Canner	350.00	300.00	650.00
Total	\$ 1,455.00	\$ 1,750.00	\$ 3,205.00
Less tithe transfer to State General Fund	145.50	175.00	320.50
Net Seal Fund Receipts	\$ 1,309.50	\$ 1,575.00	\$ 2,884.50

SCHEDULE "B"
STATEMENT OF EXPENDITURES OF FISH COMMISSION
July 1, 1966—June 30, 1968

	Totals for 1966-68 Biennium			
	General Fund	Federal Funds	Other Funds	Total
Administration:				
Direction, Policy and Liaison	\$ 105,240.27	\$ -----	\$ -----	\$ 105,240.27
Business Management	251,288.00	2,182.22	1,461.10	254,931.32
Information and Education	52,149.54	-----	-----	52,149.54
Water Resources	114,935.16	-----	-----	114,935.16
Pacific Marine Fisheries Commission	3,850.00	-----	-----	3,850.00
Columbia River Development	-----	94,402.90	-----	94,402.90
Coordination of Public Law 89-304 Activities	1,300.83	1,300.83	-----	2,601.66
Seal Fund—Bounties, Hunting	-----	-----	4,815.41	4,815.41
Miscellaneous Receipts	-----	-----	9,078.35	9,078.35
Total Administration	\$ 528,763.80	\$ 97,885.95	\$ 15,354.86	\$ 642,004.61
Fish Culture:				
Supervision	\$ 35,646.68	\$ -----	\$ -----	\$ 35,646.68
Hatchery Operation and Maintenance:				
Lower Columbia River	125,276.68	805,305.20	31,033.17	961,615.05
Willamette Basin	182,435.32	360,255.79	4,260.77	546,951.88
Coastal Rivers	325,094.44	26,391.85	-----	351,486.29
Hatchery Biology	48,013.18	251,104.99	92,329.04	391,447.21
Total Fish Culture	\$ 716,466.30	\$ 1,443,057.83	\$ 127,622.98	\$ 2,287,147.11
Research:				
Supervision	\$ 207,951.68	\$ 63,673.71	\$ 966.49	\$ 272,591.88
Inland Research	172,193.79	315,481.05	194,175.31	681,850.15
Marine Research	327,051.81	291,270.23	97,745.84	716,067.88
Total Research	\$ 707,197.28	\$ 670,424.99	\$ 292,887.64	\$ 1,670,509.91
Engineering:				
Supervision	\$ 160,733.79	\$ 268,119.61	\$ -----	\$ 428,853.40
Stream Improvement and Maintenance	90,446.88	31,014.25	-----	121,461.13
Hatchery and Laboratory Improvement	15,499.11	-----	-----	15,499.11
Total Engineering	\$ 266,679.78	\$ 299,133.86	\$ -----	\$ 565,813.64
Capital Construction:				
Nehalem Hatchery Construction	\$ 346,825.47	\$ 50,365.71	\$ -----	\$ 397,191.18
Threemile Dam Construction	-----	1,784.26	-----	1,784.26
Willamette Falls Design and Construction	-----	1,177,572.01	164,568.52	1,342,140.53
Elk River Hatchery	96,680.12	114,398.01	-----	211,078.13
Total Capital Construction	\$ 443,505.59	\$ 1,344,119.99	\$ 164,568.52	\$ 1,952,194.10
Capital Improvement:				
Grant Creek Fishway	\$ 396.76	\$ -----	\$ -----	\$ 396.76
Cascade Creek Fishway	17,984.86	-----	-----	17,984.86
Marion Forks Hatchery Paving	435.82	2,246.18	-----	2,682.00
Willamette Hatchery Roofing	1,216.52	6,269.74	-----	7,486.26
Nehalem Hatchery Residence and Rearing Ponds	-----	22,916.52	-----	22,916.52
Bonneville Hatchery Pond Improvement	-----	849.55	-----	849.55
Research Nutrition Building, Clackamas	4,551.31	11,575.04	7,023.74	23,150.09
Research Disease Building, OSU	153.36	390.04	236.67	780.07
Total Capital Improvement	\$ 24,738.63	\$ 44,247.07	\$ 7,260.41	\$ 76,246.11
Total Expenditures	\$ 2,687,351.38	\$ 3,898,869.69	\$ 607,694.41	\$ 7,193,915.48

OREGON COMMERCIAL LANDINGS OF FINFISH AND SHELLFISH

All Figures in Pounds

	1962	1963	1964	1965	1966	1967
FINFISH:						
Cod (true)	18,861	67,179	200,512	191,191	634,365	432,277
Flounders	973,135	524,074	608,004	481,794	598,302	376,683
Hake				1,498,910	65,170	17,812
Halibut	341,648	175,297	85,415	83,876	86,654	89,880
Lingcod	840,420	540,677	785,195	896,103	1,039,921	1,170,261
Mink Food	6,206,370	5,605,442	5,997,218	3,960,920	3,408,575	4,087,974
Pacific Ocean Perch	5,805,282	7,994,076	9,569,039	13,677,020	4,533,263	1,705,831
Rockfish	7,183,844	4,919,333	4,420,745	4,370,503	5,543,263	4,673,215
Sablefish	270,332	362,533	263,276	222,251	248,344	435,403
Salmon and Steelhead:						
Chinook	4,505,656	4,766,007	3,986,532	5,169,418	3,669,294	4,641,561
Chum	28,928	8,963	14,503	4,637	7,335	9,214
Coho	2,619,918	3,421,340	5,815,544	6,400,962	8,693,895	11,353,764
Humpback		23,640	77	218,679	4,406	1,234,640
Sockeye	33,465	29,919	50,213	11,873	6,893	117,550
Steelhead	557,697	797,479	361,226	416,184	349,729	424,143
Shad	1,236,375	1,309,329	784,062	786,387	1,000,441	1,060,974
Smelt	318,385	173,622	326,858	460,638	241,883	231,594
Sole:						
Dover	4,491,895	5,396,970	5,614,706	3,651,907	3,511,004	3,645,843
English	2,287,964	1,955,889	1,566,060	1,648,747	3,538,312	2,368,477
Petrals	2,698,412	2,311,801	1,889,079	1,817,161	1,806,431	1,779,739
Other	1,578,422	1,127,670	948,847	746,563	1,716,813	1,496,944
Striped Bass	53,493	68,798	46,500	41,466	48,282	31,649
Sturgeon:						
Green	64,566	40,057	47,472	37,600	55,142	36,400
White	136,152	151,513	112,827	112,646	136,645	119,503
Tuna	8,935,314	11,409,254	4,455,274	12,122,434	17,682,222	29,242,696
Other Fish	249,091	35,035	56,806	66,699	124,844	101,762
Total Finfish	51,435,625	53,215,897	48,005,990	59,096,569	58,751,428	70,885,789
SHELLFISH:						
Clams:						
Bay	106,487	84,773	62,682	49,567	47,258	27,605
Razor	26,463	24,100	34,796	73,082	83,980	122,523
Crabs	5,737,800	4,137,525	3,357,017	7,109,594	10,548,238	9,621,251
Shrimp	2,777,023	3,027,746	5,279,494	1,575,152	4,684,548	10,155,251
Total Shellfish	8,647,773	7,274,144	8,733,989	8,807,395	15,364,024	19,926,630
Total Finfish & Shellfish	60,083,398	60,490,041	56,739,979	67,903,964	74,115,452	90,812,419

LICENSES ISSUED

	1964	1965	1966	1967
Boat	1,686	1,729	1,868	2,433
Boat, Lost License	2	3	11	12
Buyer	68	77	78	88
Canner, Fish	16	15	15	16
Canner, Shellfish	6	6	5	4
Commercial Fishing	2,864	3,199	3,448	4,553
Fishing, Lost License	14	22	27	28
Gillnet, Nonresident	38	26	30	80
Gillnet, Resident	449	462	432	530
Retail	1,132	1,160	1,123	1,082
Setline	2	2	1	
Setnet	129	127	140	125
Single Delivery	63	302	354	372
Special Permit (carp)	1	2	2	3
Wholesale	131	120	151	138
Total	6,601	7,252	7,685	9,464

A major change in license structure occurred January 1, 1964. Licenses issued in prior years are not comparable and for that reason are not included in this report.

EGGS TAKEN AT FISH COMMISSION HATCHERIES

July 1, 1966—June 30, 1967

Hatchery	Spring Chinook	Fall Chinook	Coho	Chum	Steelhead	Total
Alsea .....	.....	.....	5,543,348	.....	.....	5,543,348
Big Creek .....	.....	6,541,586	11,384,484	429,209	2,127,958	20,483,237
Bonneville .....	.....	13,436,000	7,512,426	.....	.....	20,948,426
Cascade .....	.....	9,699,154	3,642,274	.....	.....	13,341,428
Klaskanine .....	.....	557,584	7,587,120	.....	.....	8,144,704
Marion Forks	1,348,489	.....	.....	.....	513,669	1,862,158
McKenzie .....	.....	.....	.....	.....	.....	-0-
North Nehalem .....	.....	.....	.....	.....	.....	-0-
Oxbow .....	.....	8,862,337	.....	.....	.....	8,862,337
Sandy .....	.....	41,861	5,013,135	.....	.....	5,054,996
Siletz .....	.....	.....	1,552,438	.....	.....	1,552,438
South Santiam .....	.....	.....	.....	.....	.....	-0-
Trask	123,446	772,942	6,209,164	.....	.....	7,105,552
Willamette	7,536,902	.....	.....	.....	.....	7,536,902
Total	9,008,837	39,911,464	48,444,389	429,209	2,641,627	100,435,526

July 1, 1967—June 30, 1968

Alsea .....	.....	.....	4,583,075	.....	.....	4,583,075
Big Creek .....	.....	4,994,767	2,702,212	163,618	887,936	8,748,533
Bonneville .....	.....	19,480,204	5,776,045	.....	.....	25,256,249
Cascade .....	.....	8,516,966	8,537,730	.....	.....	17,054,696
Klaskanine .....	.....	.....	4,178,000	.....	.....	4,178,000
Marion Forks	4,529,444	.....	.....	.....	204,278	4,733,722
McKenzie .....	.....	.....	.....	.....	.....	-0-
North Nehalem .....	.....	.....	1,356,600	.....	.....	1,356,600
Oxbow .....	.....	11,794,699	.....	.....	.....	11,794,699
Sandy .....	.....	.....	3,688,586	.....	.....	3,688,586
Siletz .....	.....	.....	1,769,095	.....	.....	1,769,095
South Santiam .....	.....	.....	.....	.....	.....	-0-
Trask	172,006	1,802,837	3,390,680	.....	.....	5,365,523
Willamette	7,344,579	.....	.....	.....	57,231	7,401,810
Total	12,046,029	46,589,473	35,982,023	163,618	1,149,445	95,930,588

DISPOSITION OF ADULT SALMON AND STEELHEAD RETURNING TO FISH COMMISSION HATCHERIES

All Figures in Numbers of Fish

July 1, 1966—June 30, 1967

Species	Transplanted	Allowed to pass hatchery rack	State & county institutions	Sold by public bid	Buried	Total
Coho	23,342	8,809	21,253	85,272	6,566	145,242
Fall Chinook .....	.....	337	2,260	17,056	777	20,430
Spring Chinook .....	.....	.....	.....	3,753	2,421	6,174
Chum .....	.....	237	.....	244	4	485
Steelhead	926	4,165	29	.....	292	5,412
Total .....	.....	.....	.....	.....	.....	177,743

July 1, 1967—June 30, 1968

Coho	27,541	4,624	24,910	91,725	8,932	157,732
Fall Chinook	1,986	58	410	12,841	1,576	16,871
Spring Chinook	3,960	.....	545	6,960	1,734	13,199
Chum .....	.....	20	.....	82	19	121
Steelhead	7,072	2,506	.....	401	173	10,152
Total .....	.....	.....	.....	.....	.....	198,075
Grand Total .....	.....	.....	.....	.....	.....	375,818

SALMON AND STEELHEAD LIBERATIONS, July 1, 1966—June 30, 1967

Hatchery & Species	Unfed Fingerlings	Fed Fingerlings	Yearlings	Total Number	Pounds	Location
Alsea						Fall Cr. (Alsea) and trib. of Coos, Coquille, Siuslaw, & Umpqua R.
Coho	2,202,090	-----	1,029,037	3,231,127	67,942	
Big Creek						
Fall Chinook	484,235	3,133,945	-----	3,618,180	36,590	Big Cr. & Will. R. trib.
Chum	-----	371,971	-----	371,971	2,776	Big Cr., Col. R.
Coho	444,288	-----	1,527,366	1,971,654	97,021	Big Cr. & Will R. trib.
Steelhead	-----	-----	89,526	89,526	12,071	Big Cr. & Will R. trib.
Total	928,523	3,505,916	1,616,892	6,051,331	148,458	
Bonneville						
Fall Chinook	4,011,435	6,676,868	-----	10,688,303	63,395	Tanner Cr. & Will. R. trib.
Coho	2,630,790	-----	869,283	3,500,073	45,121	Tanner Cr. & Will. R. trib.
Total	6,642,225	6,676,868	869,283	14,188,376	108,516	
Cascade						
Fall Chinook	3,808,600	4,834,392	-----	8,642,992	43,716	Eagle Cr. & Will. R. trib.
Coho	220,000	-----	1,239,920	1,459,920	70,661	Eagle Cr. & Will. R. trib.
Total	4,028,600	4,834,392	1,239,920	10,102,912	114,377	
Klaskanine						
Fall Chinook	-----	470,600	-----	470,600	6,443	Klaskanine R.
Coho	2,514,124	-----	1,308,280	3,822,404	97,582	Klaskanine R. & Will. R. trib.
Steelhead	-----	-----	39,180	39,180	6,423	Klaskanine R.
Total	2,514,124	470,600	1,347,460	4,332,184	110,448	
Marion Forks						
Spring Chinook	-----	-----	2,175,399	2,175,399	98,555	N. Santiam R. & Will. R. trib.
Steelhead	-----	56,355	186,403	242,758	21,466	N. Santiam R. & Will. R. trib.
Total	-----	56,355	2,361,802	2,418,157	120,021	
McKenzie						
Spring Chinook	-----	116,427	710,546	826,973	43,395	McKenzie R.
Nehalem						
Fall Chinook	-----	161,784	-----	161,784	1,926	N. Nehalem R.
Spring Chinook	-----	-----	51,875	51,875	2,106	N. Nehalem R. & Trask R.
Coho	1,012,148	-----	268,265	1,280,413	19,558	N. Nehalem R. & Will. R. trib.
Total	1,012,148	161,784	320,140	1,494,072	23,590	
Oxbow						
Fall Chinook	3,342,000	3,431,812	-----	6,773,812	35,846	Herman Cr. & Will. R. trib.
Coho	-----	-----	475,547	475,547	30,680	Tanner Cr., Col. R.
Sockeye	-----	212,222	-----	212,222	430	N. Fork Reservoir, Clackamas R.
Total	3,342,000	3,644,034	475,547	7,461,581	66,956	
Sandy						
Fall Chinook	34,399	-----	-----	34,399	29	Cedar Cr., Sandy R.
Coho	2,128,762	1,012,971	958,240	4,099,973	65,502	Cedar Cr. & Will. R. trib.
Total	2,163,161	1,012,971	958,240	4,134,372	65,531	
S. Santiam						
Spring Chinook	-----	-----	146,607	146,607	8,675	Middle Santiam R.
Siletz						
Coho	580,873	-----	550,299	1,131,172	34,782	Rock Cr. & Will. R. trib.
Trask						
Fall Chinook	-----	1,033,402	-----	1,033,402	13,440	Gold Cr., Trask R.
Spring Chinook	-----	71,042	58,729	129,771	3,503	Trask R.
Coho	1,303,232	-----	645,552	1,948,784	41,163	Gold Cr., & Coastal & Will. R. trib.
Total	1,303,232	1,104,444	704,281	3,111,957	58,106	
Wahkeena						
Fall Chinook	-----	705,800	-----	705,800	8,105	Col. R.
Coho	-----	-----	561,466	561,466	32,121	Col. R.
Total	-----	705,800	561,466	1,267,266	40,226	
Willamette						
Spring Chinook	557,536	-----	3,744,809	4,302,345	194,762	Will. R. trib.
Steelhead	-----	98,600	-----	98,600	4,250	N. Santiam R.
Total	557,536	98,600	3,744,809	4,400,945	199,012	
Total of all Hatcheries						
Fall Chinook	11,680,669	20,448,603	-----	32,129,272	209,490	
Spring Chinook	557,536	187,469	6,887,965	7,632,970	350,996	
Chum	-----	371,971	-----	371,971	2,776	
Coho	13,036,307	1,012,971	9,433,255	23,482,533	602,133	
Steelhead	-----	154,955	315,109	470,064	44,210	
Sockeye	-----	212,222	-----	212,222	430	
Grand Total	25,274,512	22,388,191	16,636,329	64,299,032	1,210,035	

SALMON AND STEELHEAD LIBERATIONS, July 1, 1967—June 30, 1968

Hatchery & Species	Unfed Fingerlings	Fed Fingerlings	Yearlings	Total Number	Pounds	Location
Alesea						Fall Cr. (Alesea) and trib. of Coos, Coquille, Siuslaw, and Umpqua R.
Coho	1,720,255	50,292	1,158,935	2,929,482	69,960	
Big Creek						
Fall Chinook		5,718,978		5,718,978	67,884	Big Cr. & Will. R. trib.
Chum		135,038		135,038	538	Big Cr., Col. R.
Coho		2,060	1,291,645	1,293,705	75,126	Big Cr., Col. R.
Steelhead	102,576		76,794	179,370	11,067	Big Cr., Clatskanie R. & Will. R. trib.
Total	102,576	5,856,076	1,368,439	7,327,091	154,615	
Bonneville						
Fall Chinook	2,540,414	7,556,932		10,097,346	87,618	Tanner Cr. & Will. R. trib.
Coho	2,322,084		1,486,257	3,808,341	93,260	Tanner Cr. & Will. R. trib.
Total	4,862,498	7,556,932	1,486,257	13,905,687	180,878	
Cascade						
Fall Chinook	2,827,295	5,098,688		7,925,983	50,549	Eagle Cr. & Will. R. trib.
Coho	1,247,403		482,477	1,729,880	27,568	Eagle Cr. & Will. R. trib.
Total	4,074,698	5,098,688	482,477	9,655,863	78,117	
Klaskanine						
Coho	1,771,884		1,198,059	2,969,943	78,594	Klaskanine & Col. R.
Steelhead			49,032	49,032	7,531	Klaskanine & Lewis & Clark R.
Total	1,771,884		1,247,091	3,018,975	86,125	
Marion Forks						
Spring Chinook	2,107,088		1,781,839	3,888,927	90,995	N. Santiam & Will. R. trib.
Steelhead	114,700	29,966	172,490	317,156	19,299	N. Santiam & Will. R. trib.
Total	2,221,788	29,966	1,954,329	4,206,083	110,294	
McKenzie						
Spring Chinook		101,068	534,487	635,555	42,956	McKenzie R.
Nehalem						
Fall Chinook		964,221		964,221	11,829	N. Nehalem R.
Coho		351,300	899,308	1,250,608	53,799	N. Nehalem R. & Coastal Lakes
Steelhead			34,706	34,706	3,667	N. Nehalem R.
Total		1,315,521	934,014	2,249,535	69,295	
Oxbow						
Fall Chinook		2,852,482		2,852,482	34,972	Herman Cr. & Tanner Cr.
Salem Park Pond						
Fall Chinook		1,741,317		1,741,317	20,747	Mill Cr. & Will. R. trib.
Sandy						
Fall Chinook		58,890		58,890	755	Cedar Cr., Sandy R.
Spring Chinook			55,900	55,900	4,681	Salmon R., Sandy R.
Coho	3,502,285		1,062,408	4,564,693	62,828	Cedar Cr., Clackamas, Molalla & Sandy R. trib.
Total	3,502,285	58,890	1,118,308	4,679,483	68,264	
S. Santiam						
Spring Chinook			147,781	147,781	8,363	Middle Santiam R.
Sockeye			242,976	242,976	1,363	Green Peter Reservoir
Total			390,757	390,757	9,726	
Siletz						
Fall Chinook		45,080		45,080	460	Rock Cr.
Coho	501,454		555,904	1,057,358	34,891	Rock Cr., Coastal & Will. R. trib.
Total	501,454	45,080	555,904	1,102,438	35,351	
Trask						
Fall Chinook		442,816		442,816	8,619	Gold Cr., Trask R.
Spring Chinook		32,427	27,225	59,652	1,881	Trask R.
Coho	345,968		614,856	960,824	38,694	Gold Cr. & Coastal trib.
Total	345,968	475,243	642,081	1,463,292	49,194	
Wahkeena						
Fall Chinook		2,093,237		2,093,237	18,714	Columbia R.
Willamette						
Spring Chinook	914,870		2,727,208	3,642,078	213,571	Will. R. trib.
Total of all Hatcheries						
Fall Chinook	5,367,709	26,572,641		31,940,350	302,147	
Spring Chinook	3,021,958	133,495	5,274,440	8,429,893	362,447	
Chum		135,038		135,038	538	
Coho	11,411,333	403,652	8,749,849	20,564,834	534,720	
Steelhead	217,276	29,966	333,022	580,264	41,564	
Sockeye			242,976	242,976	1,363	
Grand Total	20,018,276	27,274,792	14,600,287	61,893,355	1,242,779	

In Memoriam

Max Vernon Frame

On October 1, 1966, death closed the career of long-time fish culturist Max V. Frame. Born August 1, 1906 at Stayton, Oregon, Max began his career at the old Mehama Hatchery on the North Santiam on May 14, 1927. At the time of his passing he was superintendent at the Willamette River Salmon Hatchery near Oakridge. During his long career, Max was stationed at a number of other locations, including the Illahe Hatchery on the Rogue River and at Klaskanine Hatchery near Astoria. Max had a multitude of friends among his fellow employees as well as outside the department. Through the efforts of dedicated men such as Max Frame, the Commission has attained a high standing in fisheries conservation circles. His contribution to fish culture will be remembered for many years.

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Harllee Royall O'Neal

Born in Wilmington, North Carolina on January 9, 1908, Harllee O'Neal served as a civil engineer with the U. S. Army from 1940 until his early retirement in 1959 because of a heart condition. He held the rank of Lieutenant Colonel at his retirement. He worked for the Boeing Company in Seattle for three and one-half years and was employed by the Oregon State Highway Department before coming to the Fish Commission on February 14, 1966. He worked as resident construction engineer on the Willamette Falls fishway and was on an engineering field assignment at Tillamook when he suffered a fatal heart attack on June 27, 1968. During his short time with the Commission he did an outstanding job.

