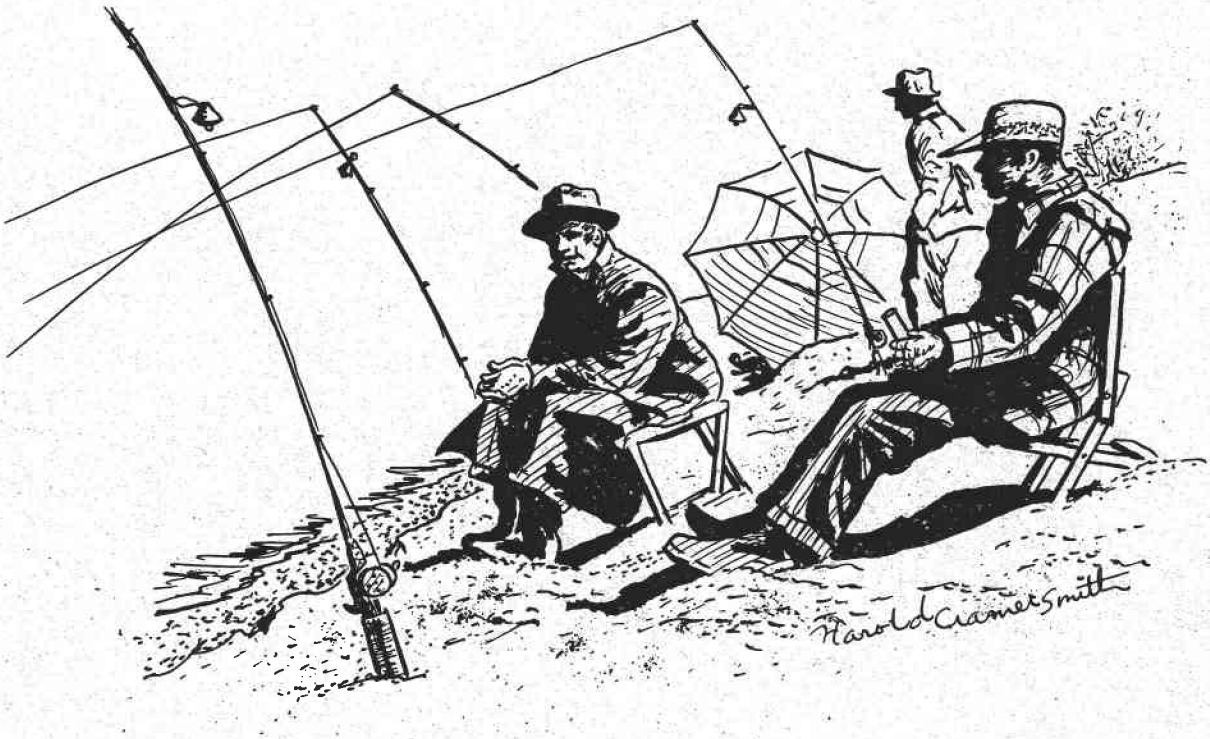
1975 ANNUAL REPORT



Fisheries

OREGON
Fish & Wildlife

1975
ANNUAL REPORT

Fisheries

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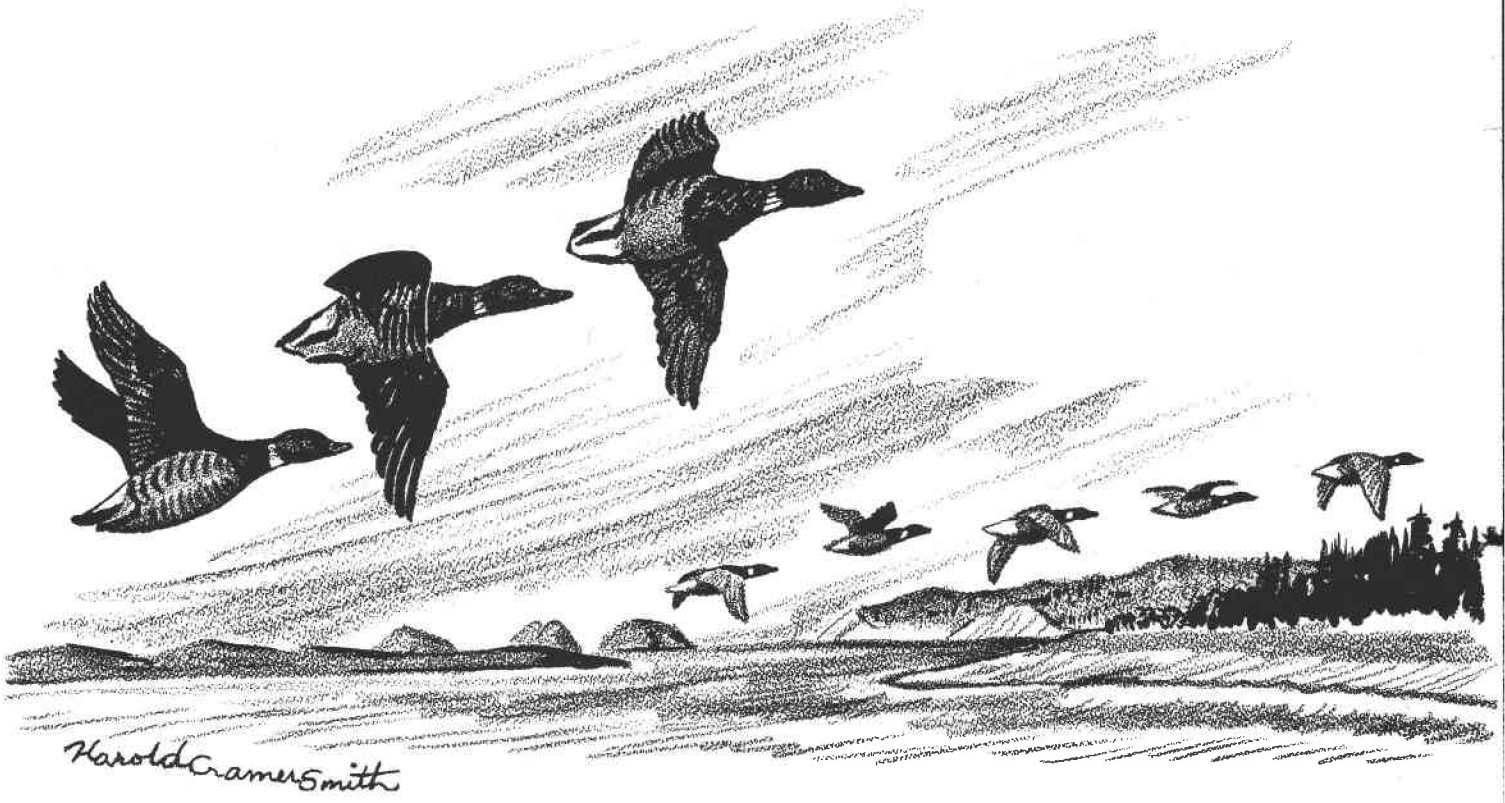

Harold Cramer Smith

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE INDEX

TABLE INDEX
(Continued)

TABLE INDEX
(Continued)

INTRODUCTION

The 1975 Annual Report has been modified substantially from previous Fish Division Annual Reports in order to provide a better review of the state's fish resources. Activities of the Fish Division and fish-related activities by other sections of the Department are now included in the report.

Passage of Senate Bill 613 by the 1975 Oregon Legislature merged the Wildlife Commission and Fish Commission into one agency, the Department of Fish and Wildlife. The merger became effective July 1, 1975, and placed all management responsibility for the state's fish and wildlife resources under one entity. Since both former agencies had fish management responsibilities, the merger required several changes in organization in order to provide the most effective management program.

The Fish Division's organizational structure contains two main staff sections--management and fish culture. A planning section charged with developing comprehensive long-range plans for both recreational and commercial fisheries is also part of the Division. The headquarters staff works closely with the five regional supervisors, 23 district fishery biologists, the Marine Region, fish culture personnel, and other sections and divisions in the Department.

The Department issued 784,476 (598,571 annual and 185,905 daily) angling licenses in 1975, slightly above the 779,121 (593,829 annual and 185,292 daily) licenses issued in 1974. The number of commercial licenses issued increased from 5,556 in 1974 to 5,566 in 1975 while the number of boat licenses issued increased from 2,978 to 3,067.

Licensed Oregon "sport" anglers were sampled to determine total fishing effort and catch through a survey conducted by the Survey Research Center and Department of Statistics at Oregon State University under contract to, and in cooperation with, our Department. The survey revealed anglers in Oregon caught approximately 11,259,800 fish in some 5,331,500 angler days of recreation. Resident cold-water fish provided 54.6% of the total recreation while salmon angling provided 19.7%, steelhead angling 11.3%, warm-water game fish 9.1%, bay and surf fish 2.7%, and sea-run cutthroat, striped bass, shad, and sturgeon the remaining 2.6%.

The 1975 sport catch of 415,928 salmon was below the 1974 catch of 465,045 fish but still exceeded the past 10-year average catch by 14,000 fish. The catch was lower due to a decline in the ocean coho catch and a large reduction in the number of chinook salmon caught in the Columbia River. The coho population was below average in 1975 as evidenced by the below-average return of adults to the Columbia River and coastal tributaries. The Columbia River was closed to angling for an extended period of

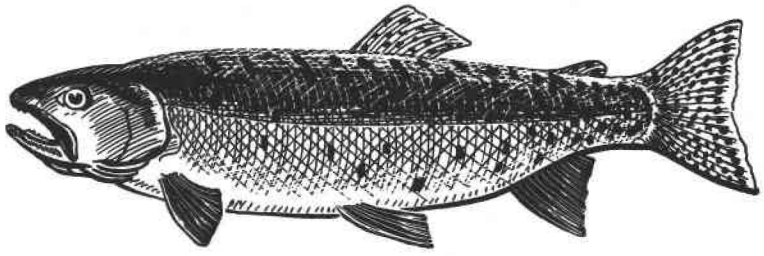
time to protect returning upriver spring chinook; this action caused the chinook catch to drop significantly.

The steelhead catch exceeded the 1974 catch by approximately 20,000 fish but was still 14,000 fish below the past 10-year average. The catch improved in both the Columbia River and coastal tributaries.

The 1975 troll salmon catch dropped from 1,361,335 fish in 1974 to 882,287 fish in 1975; the decline was due to fewer coho being taken. The chinook catch was similar for both years.

Nongame marine foodfish landings were generally below the 1974 landings. Albacore tuna, groundfish, and Dungeness crab landings were all below the 1974 catch level; however, shrimp landings were the second highest season total in the history of the fishery.

Cooperation and assistance from individuals, groups, and other public agencies contributed to the success of the Division's programs. Federal agencies making substantial contributions included the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Bureau of Land Management, U.S. Forest Service, Soil Conservation Service, and Bureau of Reclamation. The State Department of Forestry, Division of State Lands, Department of Environmental Quality, Oregon State University, and various branches of city and county governments were but a few of the local agencies providing valuable assistance.



ANADROMOUS FISH

Oregon's anadromous fish include five species of salmon-chinook, coho, chum, sockeye, and pink; summer and winter steelhead; coastal cutthroat trout; shad; striped bass; and smelt. Sturgeon, migratory but not anadromous, are also managed with this group. A brief status of the individual stocks of anadromous fish and the 1975 recreational and commercial harvests of these stocks are discussed in this section. Detailed reports on the individual fish runs, particularly Columbia River runs, can be found in other Department reports.

Status of individual stocks is often difficult to assess as the number of fish spawning in a certain stream is not known and cannot be readily estimated. However, some indices of their abundance can be determined from counts of fish at tributary dams, hatcheries, and spawning fish surveys and from sport and commercial catch estimates.

Estimates of the 1975 recreational catch were determined from: (1) Salmon-Steelhead catch card returns; (2) sales of Daily Angler licenses (ocean only); (3) creel sampling programs; and (4) a statewide Oregon Angler Survey conducted by the Survey Research Center and Department of Statistics at Oregon State University under contract to, and in cooperation with, the Oregon Department of Fish and Wildlife.

In 1975, 318,308 anglers purchased a Salmon-Steelhead Tag and an additional 57,835 anglers bought one or more Daily Angler licenses to fish for salmon or steelhead (Table 1). Forty-nine percent (185,005) of the licensed anglers were successful in catching a salmon or steelhead, 20% (74,474) fished but failed to catch a fish, and 31% (116,664) did not fish. Table 2 shows the number of cards issued, percent cards returned, and the salmon and steelhead catch for the years 1965-75.

Statistics on the commercial catch were obtained from landings reported by Oregon fish buyers. The Department issued 5,566 commercial fishing licenses and 84 Fish Buyer licenses in 1975. It is impossible to determine the number of commercial fishermen who fished for anadromous fish as many fish for one or more species of fish or shellfish.

Status of the individual stocks of fish and the recreational and commercial harvests of these stocks are discussed by area or stream within or bounding the state. Angler catch is reported by run-year (year that most fish of a specific run enter fresh water to spawn) rather than by calendar year, which sometimes results in combining the catch from two different years.

Table 1. Estimated catch of salmon and steelhead and angler success by category, 1975.

	Salmon	Steelhead	Total
Number of anglers buying Salmon-Steelhead tags			318,308
Number of anglers buying daily licenses for salmon and steelhead angling 1/			57,835
			376,143
Percentage of Salmon-Steelhead tags returned			18.97
Number of anglers not fishing			116,664
Number of anglers fishing for salmon or steelhead			259,479
Percentage of licensed anglers fishing			69.0
Number of unsuccessful anglers			74,474
Number of successful anglers	152,371	54,460	185,005
Number of fish caught	415,928	186,450	602,378
Number of fish caught per angler fishing			2.3
Number of fish caught per successful angler	2.7	3.2	3.3

1/ Daily license holders were not required to purchase a Salmon-Steelhead Tag.

Table 2. Salmon-Steelhead Tag return data and estimated salmon and steelhead catch, 1965-75.

Year	Cards Issued*	Percent Cards Returned	Salmon Catch	Steelhead Catch	Total Catch
1965	276,003	26.04	348,318	111,439	459,757
1966	288,197	23.48	287,200	168,083	455,283
1967	326,410	20.09	456,896	134,040	590,936
1968	312,063	22.09	350,113	153,909	504,022
1969	327,424	23.96	348,793	130,219	479,012
1970	353,183	21.27	422,382	164,778	587,160
1971	360,563	21.69	463,679	197,549	661,228
1972	381,235	14.80	403,010	157,907	560,917
1973	426,866	21.18	406,618	162,191	568,809
1974	417,598	21.60	465,045	166,789	631,834
1975	407,864	18.97	415,928	186,450	602,378
Average 1965-74			395,205	154,690	549,896

*Starting with 1972, this includes Daily Angling licenses (in one-day equivalents) purchased for salmon or steelhead angling.

SALMON

COLUMBIA RIVER STOCKS

Runs of adult salmon entering the Columbia River in 1975 were generally poor. All runs destined for the Snake River and upper Columbia River drainages were low. Upriver spring chinook, summer chinook, and sockeye runs were record or near-record lows. The coho run was also below average. Only the fall chinook run was above average, being the third best recorded run since 1957. Severe restrictions to the commercial and recreational fisheries were necessary to protect the depressed runs of upriver salmon.

Counts of salmon at Columbia River dams, in spawning tributaries, and at Oregon hatcheries are shown in Table 3. The 1975 count is compared with the past 5-year average count as an index of abundance of the various stocks.

Oregon anglers caught an estimated 24,300 salmon in the Columbia River and its tributaries in 1975, the lowest catch recorded during the past 10 years. The poor catch was due primarily to a low return of spring chinook and a possible increase in the catch of Columbia River fish by the offshore fisheries.

Columbia River fish runs are classified as either lower river (below Bonneville Dam) or upriver (above Bonneville Dam) in

Table 3. Indices of abundance of adult salmon in the Columbia River and its Oregon tributaries during 1975 and past 5-year averages.

Index	Spring Chinook		Fall Chinook		Coho	
	1975	Average (1970-74)	1975	Average (1970-74)	1975	Average (1970-74)
DAM COUNTS						
Columbia River						
Bonneville	97,900	130,080	219,500	136,020	32,800	40,060
Ice Harbor	20,200	39,480	1,900	6,980	710	1,340
Willamette River						
Willamette Falls	17,844	37,460	32,877	15,950	5,922	10,400
North Fork	359	400			900	1,840
Foster	1,778	2,790			152	262
Leaburg	1,273	3,010				
Fall Creek	849	1,630				
HATCHERIES						
Columbia River						
Klaskanine					687	2,560
Big Creek			9,512	10,330	802	3,510
Sandy					5,695	7,390
Bonneville Complex			12,358	13,670	14,241	33,160
Willamette River						
Marion Forks	947	1,720				
South Santiam	2,854	2,429				
Willamette	2,099	6,090				
FISH TRAPS						
Deschutes River						
Pelton Trap	142	450				
SPAWNING FISH COUNTS						
Snake River System	Peak Spawning Fish Counts[1]					
Imnaha	138	481				
Grande Ronde (Upper)	7	34				
Wallowa					8	48
Lostine	51	155				
Minam	24	114				
Catherine Creek	21	147				
Wenaha	17	122				
Bear Creek	12	25				
Lookingglass Creek	16	54				
John Day System						
N. Fk. John Day	72	143				
Granite Creek	64	200				
Lower Columbia Tributaries						
McKenzie (Willamette River)	4.9 [2]	7.0 [2]				
Big Creek			950	2,400		
Gnat Creek			70	370		
Plympton Creek			200	410		
Coho Tributaries					5	75

1/ Count includes both adults and jacks.
2/ Redds per mile.

origin. Runs destined for lower river tributaries are commercially harvested by non-Indian fishermen while those destined for upriver tributaries are harvested by both Indian and non-Indian fishermen. As a result of a 1968 U.S. Supreme Court decision that affirmed the authority of the states to regulate Indian fishing, an exclusive commercial Indian fishery zone was established between Bonneville and McNary dams. The area below Bonneville Dam is open to all commercial fishermen.

A 1975 federal court decision required the states of Oregon and Washington to allocate to the Indian fishery 50% of the harvest by those states of all fish runs destined for usual and accustomed Indian fishing areas. In order to comply with this court order the states must reduce the non-Indian catch in the ocean and lower Columbia River while attempting to distribute the permissible catch of these fish among the non-Indian user groups.

Catch records of the commercial fisheries on lower river and upriver stocks are summarized in Tables 4, 5, and 6. The tables show the total Columbia River commercial salmon harvest by both Oregon and Washington fishermen.

Table 4. Commercial catch (in thousands of fish) of lower Columbia River stocks of salmon below Bonneville Dam, 1965-75.

Year	Chinook		Coho	Chum
	Spring	Fall		
1965	3.2	57.1	230.3	0.5
1966	4.1	33.8	414.2	0.9
1967	6.8	36.9	365.5	0.9
1968	8.7	99.0	104.6	0.3
1969	8.6	78.3	187.4	0.3
1970	12.5	102.8	453.9	0.6
1971	13.4	122.1	232.5	0.5
1972	15.8	43.4	110.7	1.3
1973	17.2	165.3	173.4	1.4
1974	13.3	44.7	240.9	0.9
1975	9.1	77.4	150.1	0.5
Average 1965-74	10.4	78.7	251.3	0.8

Table 5. Commercial catch (in thousands of fish) of upriver Columbia River stocks of salmon below Bonneville Dam, 1965-75.

Year	Chinook			Coho 1/	Sockeye
	Spring	Summer 2/	Fall		
1965	73.4	0.0	146.2	1.2	0.1
1966	38.3	0.0	112.4	0.7	0.2
1967	33.0	0.7	121.9	1.7	21.2
1968	13.1	1.4	50.6	10.3	20.3
1969	30.7	1.6	108.0	1.4	16.2
1970	31.4	3.1	149.6	33.5	13.0
1971	22.6	4.5	93.8	15.9	54.9
1972	69.9	3.2	96.3	9.8	51.8
1973	60.5	1.2	105.4	5.1	2.3
1974	8.4	0.0	52.2	10.1	0.0
1975	0.0	0.0	95.9	3.3	0.0
Average 1965-74	38.1	1.6	103.6	9.0	18.0

1/ Based on one-half the early fall season catch.
2/ Incidental catch made during the open shad and sockeye seasons.

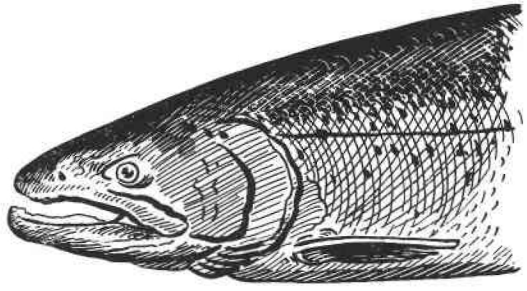
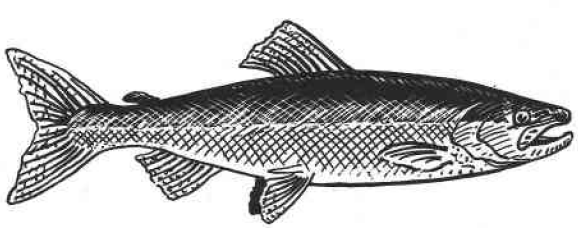


Table 6. Commercial catch (in thousands of fish) of upriver Columbia River stocks of salmon and steelhead by Indians fishing above Bonneville Dam, 1965-75.

Year	Chinook			Coho	Sockeye	Summer Steelhead
	Spring	Summer 1/	Fall			
1965	19.7	6.9	29.0	3.2	5.8	13.2
1966	2.3	1.1	9.0	8.3	4.2	3.1
1967	11.8	9.5	42.9	13.6	34.5	15.8
1968	16.0	2.1	29.1	7.6	5.0	9.4
1969	33.0	9.4	48.3	7.8	11.3	14.1
1970	14.0	4.0	39.1	15.5	4.1	13.2
1971	12.7	5.8	56.5	13.1	21.3	25.7
1972	42.8	4.4	42.9	8.7	26.1	28.8
1973	34.1	2.0	67.9	11.1	1.4	26.8
1974	17.5	0.0	54.9	6.8	0.1	12.9
1975	0.0	0.0	140.6	5.7	0.0	7.0
Average 1965-74	20.4	4.5	42.0	9.6	11.4	16.3

1/ Incidental catch made during the open shad and sockeye seasons.



Spring Chinook

Status: The 1975 upriver spring chinook run of 97,900 adult fish was the smallest run on record. Unmeasured fallback at Bonneville Dam was suspected to have occurred, making the Bonneville count and the run size even smaller. The escapement of 20,200 adults over Ice Harbor Dam and into the Snake River was approximately one-half of both the past 5-year average of 39,480 fish and the escapement goal of 40,000 fish.

Low adult returns in both 1974 and 1975 were attributed to high losses of juveniles migrating downstream from the Snake River in 1972 and 1973. In 1972, a high water flow year, fish were subjected to high levels of nitrogen supersaturation, while in 1973, a low water flow year, there was no spill at the dams and juveniles suffered high mortality passing through the turbines.

Spring chinook spawning ground surveys in Oregon tributaries of the Snake River revealed the lowest fish counts since 1950 and the lowest redd counts since 1958. The 1975 spawning fish counts and past 5-year average counts are shown in Table 3.

The Willamette River spring chinook run was also below average. The count at Willamette Falls of 17,844 adult fish was approximately one-half of the 5-year average count of 37,460 fish. The number of adults returning to Willamette River hatcheries was also about one-half of the past 5-year average (Table 3).

Recreational Harvest: The spring chinook catch in the Columbia River system dropped sharply from 43,592 fish in 1974 to 17,539 fish in 1975 (Table 7). The decline can be attributed to the low return of adult fish and the closure of the Columbia River to angling between March 31 and July 31 in order to protect adult fish destined for above Bonneville Dam. The lower Columbia River sport catch averaged over 20,000 fish from 1970-73; however, in 1975 only 1,855 fish were caught. The catch in tributary streams also declined and reflected the poor return of adult fish.

Commercial Harvest: Lower river spring chinook, primarily Willamette and Cowlitz stocks, are harvested below Bonneville Dam during the winter gill-net season. In 1975, an 8-inch minimum mesh size restriction was imposed on the fishery to minimize the steelhead catch. Also, the Columbia River above the mouth of the Willamette River was closed to protect upriver spring chinook holding below Bonneville Dam. During the 10-day season from March 1 to March 11, approximately 9,100 chinook were caught, slightly below the past 10-year average catch of 10,400 fish (Table 4).

Upriver spring chinook are predominantly harvested during the spring commercial seasons below and above Bonneville Dam. Due to the poor return of upriver fish in 1975 no spring seasons were allowed. However, a few upriver fish were caught during

Table 7. Sport catch of spring chinook salmon in the Columbia River system, 1966-75. 1/

Stream	Run Year									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Columbia River System										
Calapooya River	0	0	16	0	27	13	17	4	11	0
Catherine Creek	226	101	36	44	4	30	11	124	0	0
Clackamas River	752	567	592	525	789	995	1,322	250	963	701
Columbia River (Lower)	14,300	23,200	15,700	17,500	28,800	18,700	23,000	26,452	10,578	1,855
Columbia River (Upper)	1,200	1,600	600	500	700	174	653	1,010	199	18
Deschutes River	1,037	848	989	1,686	2,124	1,700	3,481	4,804	1,344	402
Eagle Creek (Clackamas)	-	-	-	-	-	-	-	60	115	24
Grande Ronde River	193	73	97	78	50	17	17	18	0	0
Imnaha River	43	31	116	46	48	26	45	96	0	0
John Day River	31	156	49	12	42	16	38	117	24	8
McKenzie River	1,291	1,276	970	850	521	617	1,125	1,510	1,022	461
Minam River	30	18	26	123	63	4	6	7	0	0
Molalla River	82	56	29	33	17	7	24	39	3	12
Sandy River	52	77	39	120	146	92	142	36	36	0
Santiam River	602	803	728	998	1,582	1,320	597	698	698	278
Santiam River, N. F.	-	-	-	-	-	-	-	-	-	167
Santiam River, S. F.	-	-	-	-	-	-	-	-	-	44
Snake River	67	39	49	27	19	4	0	30	0	0
Wallowa River	107	25	33	65	10	4	0	29	0	0
Wenaha River	22	11	23	53	16	36	0	8	0	0
Willamette River	12,176	16,216	16,531	22,669	21,446	25,740	20,924	16,128	28,599	13,569
Total	32,221	45,097	36,623	45,329	56,404	49,495	51,402	51,420	43,592	17,539

1/ Estimates from 1971 on are corrected for bias.

the winter gill-net season for lower river spring chinook and during the Indian winter set-net season.

Summer Chinook

Status: The summer chinook is the most threatened race of all chinook salmon present in the Columbia River system. The run size has steadily declined since 1957, and the 1975 estimated run of 44,000 fish was the second lowest on record. Blocked and inundated spawning and rearing areas, high mortality of smolts passing hydroelectric dams, and high prespawning losses of adults due to upstream passage stress have all contributed to the declining runs.

Recreational Harvest: No recreational harvest of summer chinook was allowed in 1975.

Commercial Harvest: Commercial seasons for summer chinook have not been set since 1964; however, a few fish are incidentally taken in the shad and sockeye fisheries both below and above Bonneville Dam. Since shad and sockeye seasons were not established in 1975, no summer chinook were harvested.

Fall Chinook

Status: Fall chinook destined for tributaries below Bonneville Dam enter the Columbia River from late August through October. The 1975 lower river run was estimated to be 147,900 adults, below the past 5-year average of 159,900 fish. A total of 9,512 adults returned to Big Creek Hatchery and 12,358 adults to the Bonneville Hatchery complex, both about average returns. The count at the Willamette Falls fishway of 32,877 adults was similar to the 1974 count, indicating the continued importance of this introduced run.

Upriver fall chinook enter the Columbia River during August with peak passage over Bonneville Dam occurring in early September. The 1975 Bonneville Dam count of 219,500 adults was significantly greater than the past 5-year average count of 136,020 fish. Adult escapement past all fisheries was about 97,000 fish which fell within the escapement goal of 90,000-110,000 adult upriver fish. Counts of fall chinook passing dams in the upper Columbia and Snake rivers were poor in comparison to the Bonneville count. The tremendous contribution of the USFWS Spring Creek Hatchery in Washington, as evidenced by a record return of over 30,000 chinook, was a major factor in producing the above-average 1975 upriver run.

Recreational Harvest: The fall chinook sport catch in the Columbia River system has steadily declined from about 15,000 fish in the early 1970's to 3,523 fish in 1975 (Table 8). A possible contributing factor to the drop in catch is a decline

Table 8. Sport catch of fall chinook salmon in the Columbia River system, 1966-75. 1/

Stream	Run Year									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Columbia River System										
Big Creek	516	1,175	663	997	1,540	363	34	77	230	5
Clackamas River	177	244	420	750	1,691	497	234	53	200	54
Clatskanie River	12	70	74	99	7	0	51	5	66	0
Columbia River (Lower)	9,155	11,142	8,147	6,771	9,996	9,671	6,801	4,445	1,305	1,289
Columbia River (Upper)	500	900	300	300	600	589	417	358	274	578
Deschutes River	881	1,057	2,410	2,562	2,283	1,823	697	514	605	215
Eagle Creek (Clackamas)	-	-	-	-	-	-	-	247	149	0
Gnat Creek	0	4	6	54	439	276	1,035	273	11	167
Grande Ronde River	183	77	60	68	63	16	0	0	0	0
John Day River	122	66	16	50	27	36	50	32	74	36
Klaskanine River	73	882	575	685	133	206	18	25	122	1
Lewis and Clark River	0	4	10	3	0	19	17	4	8	0
Sandy River	266	493	920	707	2,715	427	71	112	477	76
Santiam River	9	0	36	9	27	0	53	353	30	363
Santiam River, N. F.	-	-	-	-	-	-	-	-	-	198
Santiam River, S. F.	-	-	-	-	-	-	-	-	-	107
Scappoose Creek	0	0	0	27	0	10	0	7	0	0
Snake River	101	38	74	93	70	4	6	0	0	0
Willamette River	228	261	161	620	334	300	356	42	98	434
Total	12,223	16,413	13,872	13,795	19,925	14,237	9,840	6,547	3,649	3,523

1/ Estimates from 1971 on are corrected for bias.

in the abundance of bright upriver fish which have a tendency to bite better and are preferred by anglers over the darker, lower river race commonly called "tules."

Commercial Harvest: Lower river fall chinook are harvested below Bonneville Dam during the late fall gill-net fishery in September and October. The season opened in three segments in 1975 in order to reduce the catch of upriver chinook and steelhead which had not yet passed over Bonneville Dam. The season opened September 10 below Tongue Point, September 14 below the Interstate Bridge at Vancouver, and September 21 in the entire below-Bonneville area. The season closed on November 7. The 1975 harvest of 77,400 chinook was about 1,300 fish below the past 10-year catch average (Table 4).

The commercial harvest of upriver fall chinook below Bonneville Dam occurs during the August gill-net fishery. The 1975 catch of 95,900 chinook was approximately 7,700 fish below the past 10-year average catch (Table 5). The reduced catch was the result of an early season closure adopted to provide more fish to the treaty Indian fishery.

The 1975 fall season for Indians fishing above Bonneville Dam opened on August 8 and ran until October 10. The Indian fishery harvested 140,600 fall chinook which more than doubled the previous high catch of 67,900 fish made in 1973 (Table 6).

Coho

Status: The 1975 Columbia River coho run was estimated to be 423,700 fish, well below the past 10-year average of 583,850 fish. Improved fish cultural techniques are believed responsible for the increased coho runs of the 1960's; however, variable juvenile survival and increasing ocean fisheries have resulted in significant fluctuations in the run size in recent years. The Bonneville Dam count of 32,800 adult coho was below the past 5-year average count of 40,060 fish. The Willamette Falls fishway count of 5,922 adults was also below the recent average of this introduced run. Adult returns to Oregon Columbia River hatcheries were less than one-half of the average at all hatcheries except one. Spawning fish counts of wild coho in tributaries of the lower Columbia revealed extremely low numbers of fish.

Recreational Harvest: The 1975 sport catch of 3,240 coho in the Columbia River system was below average (Table 9). Coho do not contribute significantly to the freshwater sport fishery as adults do not bite well once they enter fresh water.

Commercial Harvest: The commercial harvest of coho in the Columbia River occurs from late August to early November, primarily below Bonneville Dam. The 1975 harvest of 150,000 lower river coho was well below the past 10-year average catch of

Table 9. Sport catch of coho salmon in the Columbia River system, 1966-75. 1/

Stream	Run Year 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Columbia River System										
Bear Creek	0	0	0	6	11	4	-	-	-	0
Big Creek	216	115	221	142	142	198	170	95	230	98
Calapooya River	0	0	4	0	13	0	17	0	0	0
Clackamas River	271	535	1,323	920	821	1,685	1,607	232	200	402
Clatskanie River	126	34	20	42	7	63	29	74	66	56
Columbia River (Lower)	3,014	3,234	2,017	2,016	2,926	2,662	3,287	1,491	536	447
Columbia River (Upper)	25	24	17	15	29	18	18	17	10	22
Deschutes River	16	10	22	27	30	52	61	64	55	20
Eagle Creek (Clackamas)	-	-	-	-	-	-	-	1,330	149	461
Gnat Creek	7	0	0	0	7	75	33	32	11	8
Grande Ronde River	40	7	24	26	4	3	82	53	3	0
Hood River	38	13	6	22	40	29	27	18	30	46
John Day River	81	21	0	25	44	43	0	0	0	0
Johnson Creek	14	22	7	3	10	4	0	7	3	8
Klaskanine River	562	78	102	107	74	86	144	322	122	274
Lewis and Clark River	13	3	3	0	0	4	6	19	8	16
McKenzie River	9	4	3	0	4	0	0	0	0	0
Minam River	9	10	4	3	7	3	0	7	0	0
Molalla River	3	0	6	0	4	9	0	0	0	0
Sandy River	543	387	589	739	1,099	635	818	740	477	1,115
Santiam River	4	13	21	0	13	10	15	27	30	14
Santiam River, N. F.	-	-	-	-	-	-	-	-	-	0
Santiam River, S. F.	-	-	-	-	-	-	-	-	-	0
Scappoose Creek	0	25	3	3	0	4	19	12	0	0
Snake River	0	0	0	0	0	0	0	0	0	0
Sucker Creek	34	11	19	0	0	0	0	0	0	8
Umatilla River	10	0	0	0	0	10	0	0	0	0
Wallowa River	31	20	6	3	13	16	6	11	14	8
Willamette River	185	80	96	191	176	173	115	412	98	237
Total	5,251	4,646	4,513	4,290	5,474	5,786	6,460	4,966	2,042	3,240

1/ Estimates from 1971 on are corrected for bias.

251,300 fish (Table 4). The poor catch was attributed to the low return of adults and the late season opening.

The catch of upriver coho was 3,300 fish by non-Indian gill-netters (Table 5) and 5,700 fish by Indian fishermen (Table 6). Both catches were below average, the result of mesh restrictions imposed to protect steelhead and a below-average coho run.

Sockeye

Status: The 1975 Columbia River sockeye run of 55,400 fish was about one-half of the past 10-year average run of 105,500 fish. Juvenile sockeye were thought to have experienced high mortality while passing through turbines at dams during their out-migration in 1973. Counts of spawning fish in the Okanogan River system in Washington revealed 9,700 fish compared to the 10-year average count of 16,900 fish. However, the spawning index of 13,600 fish in the Wenatchee River system in Washington was above the 10-year average of 9,000 fish and the highest recorded count since 1966. Few sockeye spawn in Oregon tributary streams.

Recreational Harvest: Sockeye are rarely caught by the sport angler.

Commercial Harvest: Commercial sockeye seasons were not established below or above Bonneville Dam in 1975 due to the low number of returning adults. However, a few fish were taken in the Indian subsistence and ceremonial fisheries above Bonneville Dam.

Chum

Status: Chum runs in the Columbia River have been at low levels since the early 1950's and they are not expected to improve. Most of the chum entering the river spawn in Washington tributary streams below Bonneville Dam.

Recreational Harvest: Chum salmon are seldom caught by the sport angler.

Commercial Harvest: The commercial catch of chum in the Columbia River is small as the remaining runs are remnant runs and the majority of the fish enter the river after the commercial seasons have closed. Only 500 chum were caught in the commercial fisheries in 1975, about 300 fish less than the past 10-year average catch (Table 4).

COASTAL STOCKS

Salmon enter most coastal rivers and tributaries and it is difficult to assess the condition of the various stocks of fish.

Table 10 summarizes the available fish counts at dams, hatcheries, and on spawning grounds and provides the only numerical index of their abundance.

The river sport catch of fall chinook and coho salmon has generally declined during the 1970's. With few exceptions this trend is shown by all of the coastal tributaries. The reduction in catch appears correlated with the increasing offshore catch which results in fewer fish returning to their stream of origin. Increased fishing pressure in fresh water as well as in the ocean sport and troll fisheries has been stimulated in part by increased hatchery production. As effort has increased to harvest hatchery fish, heavy cropping of the wild stocks has also occurred.

In the past, environmental degradation of the watersheds as well as commercial fishing in coastal streams has been blamed for low returns. However, commercial fishing in coastal streams was closed by state law in 1957 (except Tillamook Bay which was closed by regulatory action in 1962), and major efforts to improve spawning habitat has not resulted in a large increase in the number of returning adults.

Spring Chinook

Status: The number of spring chinook entering the Umpqua and Rogue rivers, the two major coastal watersheds where they occur, was below average in 1975. The adult count over Winchester Dam (Umpqua River) was 7,009 fish compared to the past 5-year average count of 10,480 fish. The count over Gold Ray Dam (Rogue River) was 18,751 chinook, also well below the past 5-year average count of 27,810 fish. Resting pool surveys conducted on the South Umpqua River revealed 89 spring chinook, well below the past 5-year average count of 140 chinook. Resting pool surveys normally conducted on the Wilson, Trask, and Nestucca rivers were not done in 1975.

Recreational Harvest: Most of the spring chinook sport catch occurs in the Rogue and Umpqua river systems. Catch levels in these streams have shown a general declining trend during the 1970's while the catch in north coast streams like the Nestucca, Trask, and Wilson rivers has increased. The increased catch is due primarily to increased stocking of hatchery smolts. The spring chinook catch from all coastal streams totaled 14,443 fish in 1975 (Table 11).

Commercial Harvest: Commercial harvest of spring chinook salmon is not permitted in coastal streams.

Fall Chinook

Status: Fall chinook occur in most coastal streams. Eight representative streams were surveyed for spawning fish in 1975

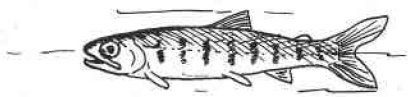
Table 10. Indices of abundance of adult salmon in coastal streams of Oregon during 1975 and past average or median values.

Index	Spring Chinook		Fall Chinook		Coho	
	1975	Average (1970-74)	1975	Average (1970-74)	1975	Average (1970-74)
DAM COUNTS						
Winchester (Umpqua)	7,009	10,480	25	112	481	325
Gold Ray (Rogue)	18,751	27,810			151	160
HATCHERIES						
North Nehalem					250	5,080
Trask	359	245	530	480	467	7,440
Siletz					407	2,300
Fall Creek (Alsea)					3,822	10,780
Elk River			1,578 1/	2,830	0	50
SPAWNING COUNTS						
Stream System			Count 2/	15-Year Median	Count 2/	14-Year Median
Nehalem			100 (28)	104	14 (6)	19
Wilson					50 (4)	51
Nestucca			31 (1)	64	9 (1)	13
Siletz			17 (3)	28		
Yaquina			4 (1)	15	8 (0)	26
Alsea			10 (1)	30	22 (0)	30
Siuslaw			166 (60)	122	13 (0)	9
Smith					20 (2)	19
Umpqua					61 (4)	145
Tenmile Lake					151 (36)	899
Coos			26 (4)	7	79 (46)	52
Coquille			27 (9)	19	30 (1)	44

1/ Includes fish returning to the trap on Jack Creek (Chetco River).
2/ Jacks, included in total, in parentheses.

Table 11. Spring chinook salmon sport catch in Oregon coastal streams, 1966-75.

Stream	Run Year 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Coastal Tributaries										
Alsea River & Bay	36	17	37	105	35	30	10	5	11	17
Kilchis River	36	26	20	4	21	45	14	26	18	34
Miami River	22	30	100	8	6	1	33	8	0	8
Nestucca River & Bay	314	231	454	493	433	379	468	417	629	938
Nestucca River, Little	-	-	-	-	47	17	5	34	7	5
Rogue River	7,599	5,886	6,210	17,957	11,970	9,395	9,577	6,589	6,836	5,223
Salmon River	90	164	105	125	103	0	28	7	0	24
Siletz River & Bay	117	190	71	129	56	89	39	15	118	100
Siuslaw River & Bay	157	70	534	346	673	10	389	25	39	0
Tillamook Bay	17	45	99	150	71	30	28	28	38	0
Tillamook River	26	160	121	832	498	35	128	95	140	117
Trask River	506	376	762	809	996	1,340	557	1,325	1,686	1,430
Umpqua River	4,730	7,720	10,688	11,254	12,059	7,854	7,236	3,193	2,854	4,092
Umpqua River, N. F.	652	700	921	5,001	2,016	1,659	3,973	2,052	2,286	1,902
Umpqua River, S. F.	-	-	1	4	19	4	11	0	5	37
Wilson River	288	71	175	245	130	311	229	316	355	516
Total	14,590	15,686	20,298	37,462	29,199	21,199	22,725	14,135	15,022	14,443



to obtain data on the relative status of the wild stocks on a coast-wide basis. Counts of chinook exceeded median numbers in only three of the eight streams surveyed (Table 10).

Recreational Harvest: The fall chinook sport catch in coastal streams has declined from the late 1960's level but has remained fairly constant the past 5 years. The catch of 20,840 fish in 1975 was only 2,175 fish below the past 5-year average catch (Table 12).

Commercial Harvest: Commercial harvest of fall chinook salmon is not permitted in coastal streams.

Coho

Status: Coho salmon occur in most coastal streams and usually spawn in the smaller tributaries. Eleven different stream systems were surveyed coast-wide in 1975 to evaluate the wild coho spawning population. Counts of spawning fish were above their median values in only 3 of the 11 streams surveyed and only the Coos River showed a large increase above its median value (Table 10). The general trend of counts appears to show a continuing decline in the stocks of wild coho.

Recreational Harvest: The river sport catch of coho has also declined in recent years and is probably correlated with the increasing offshore catch which results in fewer fish returning to spawn. Best angler success occurred on streams where hatchery smolts were released such as the Alsea, Nehalem, Siletz, and Trask rivers. The 1975 catch of 15,278 fish was slightly below the 1974 catch (Table 13).

Commercial Harvest: Commercial harvest of coho salmon is not permitted in coastal streams.

Chum

Status: Chum salmon enter north coastal streams in November and December with the largest number being found in tributary streams of Tillamook and Nestucca bays. Spawning counts are conducted on selected tributaries of these bays in order to establish trends in the wild run. The 1975 average peak count for all Tillamook Bay surveys was 559 chum per mile, slightly below the 1974 average of 583 but nearly double the past 10-year average of 300. Chum runs into these streams have increased in recent years but have not approached the magnitude of the early 1950 runs. In Nestucca Bay tributaries chum averaging 50 per mile were observed, below both the 1974 count of 127 and the past 10-year average count of 70.

Recreational Harvest: Chum salmon are not generally caught on sport gear although a few are usually taken from tributary streams of Tillamook Bay.

Table 12. Fall chinook salmon sport catch in Oregon coastal streams, 1966-75.

Stream	Run Year 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Coastal Tributaries										
Alsea River & Bay	1,034	3,037	3,489	3,256	1,664	1,188	534	706	424	652
Beaver Creek	97	25	158	48	75	68	-	67	28	24
Big Elk Creek (Yaquina System)	-	-	-	-	-	-	-	-	-	206
Chetco River & Bay	1,415	2,172	1,042	1,526	3,816	3,224	4,590	1,243	1,855	3,642
Coos River & Bay	2,582	1,932	4,863	4,900	3,757	203	85	110	141	161+
Coquille River & Bay	842	733	599	554	648	936	329	390	308	1,092
Drift Creek	318	277	439	313	287	144	67	156	95	249
Elk River	2,068	858	771	1,010	3,063	1,099	1,685	1,118	2,144	3,535
Euchre Creek	-	-	0	13	9	8	-	0	0	0
Floras Creek & New River	108	324	54	288	403	571	109	217	156	151
Hunter Creek	149	183	353	158	202	226	251	53	80	119
Illinois River	113	155	81	29	103	84	211	135	295	182
Kilchis River	371	565	384	400	371	371	241	429	331	308
Miami River	26	37	9	30	6	36	47	20	146	76
Millicoma River	10	3	1	0	3	12	2	3	22	38
Nehalem River & Bay	376	1,127	647	775	406	506	300	157	137	85
Nehalem River, N. F.	-	-	-	-	-	-	-	41	41	21
Neskowin Creek	36	14	22	43	20	22	26	6	4	24
Nestucca River & Bay	2,413	2,429	3,006	2,164	2,478	1,768	1,921	1,939	1,682	1,826
Nestucca River, Little	-	-	-	-	87	72	47	107	29	44
Pistol River	132	85	118	396	140	94	303	32	64	115
Rock Creek	2	116	14	50	87	27	49	18	0	21
Rogue River	4,338	4,090	3,765	3,896	2,595	2,402	2,524	3,144	3,660	2,044
Salmon River	270	240	363	284	329	309	170	204	76	127
Siletz River & Bay	937	1,362	1,540	1,125	596	563	446	354	268	357
Siuslaw River & Bay	394	620	1,901	1,947	2,024	237	687	198	146	121
Sixes River	629	730	472	901	676	703	350	136	376	1,305
Smith River	26	11	8	4	6	2	3	2	1	2
Tillamook Bay	2,053	3,959	3,663	3,840	1,760	1,573	1,011	1,597	1,897	640
Tillamook River	28	36	65	201	150	106	41	133	282	213
Trask River	1,592	1,660	2,001	1,711	2,161	1,734	986	1,975	2,928	1,345
Umpqua River & Bay	1,848	2,151	3,719	2,911	4,195	1,302	1,778	706	438	388
Umpqua River, N. F.	56	45	103	488	158	79	228	169	103	118
Umpqua River, S. F.	-	-	13	0	5	8	3	14	12	5
Wilson River	794	1,119	962	1,369	1,071	1,032	567	1,307	1,063	1,016
Winchuck River	486	219	1,829	221	546	160	347	248	153	449
Yachats River	21	40	84	18	8	15	2	5	1	8
Yaquina River & Bay	2,983	2,201	1,595	1,329	1,944	351	474	331	715	131
Total	28,547	32,555	38,133	36,234	35,849	21,235	20,414	17,470	20,106	20,840

Table 13. Coho salmon sport catch in Oregon coastal streams, 1966-75.

Stream	Run Year 1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Coastal Tributaries										
Alsea River & Bay	4,835	12,758	10,012	12,504	7,801	5,573	2,684	3,900	2,618	3,058+
Big Elk Creek (Yaquina System)	-	-	-	-	-	-	-	-	-	179+
Chetco River & Bay	72	112	52	70	200	166	215	64	98	166+
Coos River & Bay	648	595	501	526	400	248	165	193	99	347+
Coquille River & Bay	666	481	292	467	718	506	529	270	292	249+
Devils Lake	0	10	0	62	-	-	22	0	18	4
Elk River	18	8	8	9	30	11	17	11	21	24
Kilchis River	241	320	211	211	195	215	152	223	169	135+
Miami River	67	47	17	37	13	48	66	39	226	111
Millicoma River	42	17	8	31	42	66	27	8	69	62+
Necanicum River	201	198	198	270	325	81	110	162	70	32
Nehalem River & Bay	4,345	6,746	6,500	10,768	5,428	5,701	2,553	1,856	1,952	614
Nehalem River, N. F.	-	-	-	-	-	-	-	1,303	1,359	595
Neskowin Creek	37	11	57	51	23	14	6	9	7	12
Nestucca River & Bay	1,480	1,489	1,842	1,233	1,511	1,152	1,199	1,158	1,049	854+
Nestucca River, Little	-	-	-	-	97	77	67	69	35	27
Rock Creek	6	422	63	125	435	131	213	82	143	86
Rogue River	97	104	113	94	61	46	53	69	76	44
Salmon River	889	858	1,186	868	1,151	1,026	679	659	485	635+
Salmonberry River	12	24	32	56	69	10	33	11	26	4
Siletz River & Bay	3,794	5,099	5,294	4,145	2,457	2,219	1,894	1,388	1,184	1,425+
Siltcoos Lake	1,240	319	1,055	371	207	100	373	280	244	413
Siuslaw River & Bay	2,222	4,045	6,737	5,716	4,099	2,434	1,569	1,257	733	1,199+
Sixes River	6	7	4	8	6	7	3	1	2	8
Smith River	667	172	414	397	1,264	413	507	197	206	396
Tahkenitch Lake	13	15	108	69	23	53	19	30	8	4
Tenmile Creek	-	-	388	254	910	665	200	228	103	266
Tenmile Lakes	-	-	739	227	844	223	31	160	70	159+
Tenmile Creek & Bay	798	362	-	-	-	-	-	-	-	-
Tillamook Bay	451	1,431	1,111	1,369	443	522	212	276	400	105
Tillamook River	19	18	54	133	94	83	30	131	137	178+
Trask River	1,175	1,347	1,488	1,310	1,713	1,240	836	1,337	2,401	1,042+
Umpqua River & Bay	3,752	4,330	7,346	7,616	9,467	1,432	2,702	1,200	1,153	1,727
Umpqua River, N. F.	16	17	14	67	87	16	159	12	74	31
Umpqua River, S. F.	-	5	18	24	29	19	14	14	21	10
Wilson River	792	1,197	767	1,118	1,201	968	561	1,192	918	893+
Yachats River	335	366	349	129	105	39	50	35	28	84
Yaquina River	1,535	1,131	844	704	732	218	226	174	333	100
Total	30,471	44,061	47,822	51,039	42,180	25,722	18,176	13,048	16,877	15,278+

Commercial Harvest: Commercial harvest of chum salmon is not permitted in coastal streams.

OFFSHORE SALMON HARVEST

Recreational Harvest of Ocean Salmon: Most salmon caught by recreational anglers are caught in the ocean fishery. The 1975 season opened on May 1 and extended through December 31. The 1975 Oregon offshore salmon catch is listed by port and species in Table 14.

The number of chinook salmon landed by sport fishermen during the past 10 years has ranged from a low of 25,100 fish in 1968 to 76,000 fish in 1975 (Table 15). Coho landings for the same period have ranged from 227,900 fish in 1966 to 351,000 fish in 1967 (Table 15). Chinook landings have increased while coho landings have remained relatively stable. From 1970 to 1974 the Oregon catch accounted for about 8% of the total chinook salmon and 20% of the total coho salmon landed by the offshore sport fishery along the Pacific Coast.

Offshore sport fishing effort, indicated by the number of individual angler trips, was relatively stable from 1966 through 1974 but increased significantly in 1975. Excellent weather and ocean conditions were believed responsible for the increased effort as the total catch was less than in 1974. Angler success, expressed as fish caught per angler trip, shows no trend during the past 10-year period (Table 16).

Commercial Harvest of Ocean Salmon: Chinook, coho, and pink salmon are caught in the ocean troll fishery. The 1975 troll season opened on April 15 for chinook and June 15 for coho salmon. The closing date was October 31 for all of the coast except for an area around the mouths of the Elk and Chetco rivers which remained open through December in order to harvest returning hatchery fish. Minimum size limits of 26 inches and 15 inches were in effect during the season for chinook and coho, respectively.

During the 1975 season, 657,387 coho (Table 17) and 224,708 chinook (Table 18) were landed at Oregon ports. Coho landings were below average while chinook landings were considerably above average. Pink salmon contribute to the troll fishery principally in odd years and usually represent an insignificant portion of the total catch (Table 19).

Department samplers examined 39,676 chinook and 82,894 coho for marks and coded-wire tags during the season. Most of the chinook marks originated from Oregon coastal streams, particularly the Umpqua, Rogue, Elk, and Chetco rivers. Most coded-wire tagged chinook and marked and coded-wire tagged coho originated in the Columbia River. Marks and tags were also

Table 14. Oregon offshore salmon sport fishing effort and catch (in thousands) for 1975.

Area	Total Angler Trips	Catch			Salmon Per Angler Trip
		Coho	Chinook	Total	
Brookings	46.9	15.4	8.9	24.4 1/	0.52
Cape Kiwanda	9.4	5.5	0.2	5.8 2/	0.62
Columbia	79.9	42.5	47.7	90.2 3/	1.13
Coos Bay	31.3	31.2	2.8	34.0 4/	1.09
Depoe Bay	36.2	29.6	1.8	31.9 5/	0.88
Florence	22.9	12.1	1.0	13.1	0.57
Garibaldi	24.0	12.5	0.9	13.4 6/	0.56
Gold Beach	9.8	4.1	1.7	6.0 7/	0.61
Nehalem	12.5	6.5	0.5	7.0	0.56
Newport	59.1	32.3	3.0	35.5 8/	0.60
Winchester	72.6	58.7	6.6	65.4 9/	0.90
Minor Ports and "Pacific Ocean"	2.9	1.8	0.6	2.4	0.83
Totals	407.5	252.2	75.7	329.1	0.81

1/ Includes 98 pink salmon.
2/ Includes 93 pink salmon.
3/ Includes 13 pink salmon.
4/ Includes 16 pink salmon.
5/ Includes 471 pink salmon.
6/ Includes 83 pink salmon.
7/ Includes 184 pink salmon.
8/ Includes 190 pink salmon.
9/ Includes 70 pink salmon.

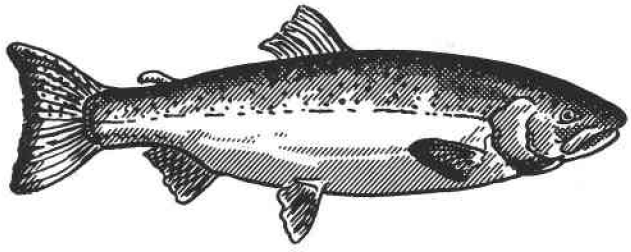


Table 15. Oregon offshore salmon sport catch (in thousands of fish) for the years 1966-75. 1/

Year	Species		
	Chinook	Coho	Total Salmon
1966	37.4	227.9	265.3
1967	42.8	351.0	393.8
1968	25.1	265.8	290.9
1969	31.8	232.9	264.7
1970	42.9	257.4	300.3
1971	29.6	311.7	341.3
1972	44.1	248.4	292.5
1973	61.0	234.1 2/	295.1
1974	40.3	311.0 3/	351.3
1975	75.7	253.4 4/	329.1
Average 1966-74	39.4	271.2	310.6

1/ Jack salmon landed at sampled ports during the creel sampling program are included in the chinook and coho catch.
2/ Includes 2,008 pink salmon.
3/ Includes 34 pink salmon.
4/ Includes 1,218 pink salmon.

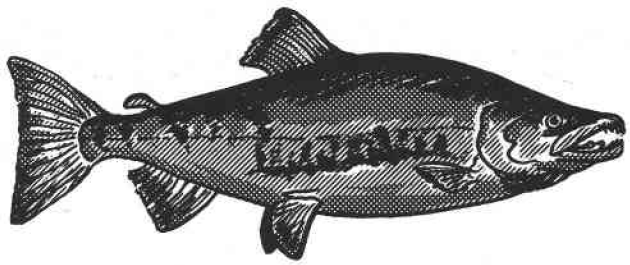


Table 16. Effort and catch-per-unit-of-effort by the Oregon offshore salmon sport fishery for the years 1966-75.

Year	Salmon/Angler Trip		Number of Angler Trips (in thousands)
	Astoria	Tillamook Head South	
1966	1.55	0.65	341.9
1967	1.89	0.97	351.5
1968	1.49	0.86	300.1
1969	1.23	0.73	326.7
1970	1.36	0.82	322.2
1971	2.09	0.97	303.7
1972	1.70	0.66	331.7
1973	0.88	0.83	350.4
1974	1.65	0.89	335.8
1975	1.13	0.73	407.5
Average 1966-74	1.54	0.82	329.3

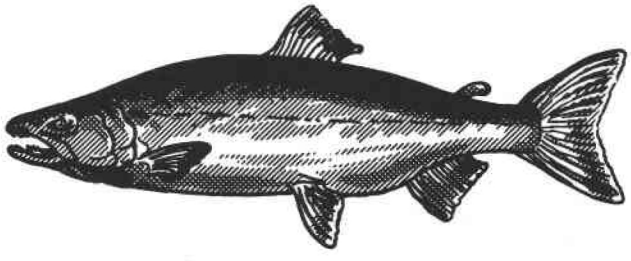


Table 17. Number of coho salmon landed, by area, in the Oregon commercial troll fishery, 1966-75.

Year	Area					Total
	Astoria to Tillamook Head	Tillamook Head To Cascade Head	Cascade Head To Heceta Head	Heceta Head To Cape Blanco	Cape Blanco To California	
1966	129,519	64,798	139,657	216,474	96,236	646,684
1967	158,375	134,252	275,174	323,297	112,978	1,004,076
1968	97,843	132,636	121,439	397,908	75,526	825,352
1969	48,372	68,902	140,102	228,777	71,184	557,337
1970	100,537	84,756	368,752	335,133	112,332	1,001,510
1971	129,135	221,423	340,392	514,726	284,446	1,490,122
1972	63,714	116,858	225,903	352,962	65,165	824,602
1973	31,720	79,869	258,001	324,000	101,887	795,477
1974	44,151	153,697	402,390	441,667	95,291	1,137,196
1975	42,808	109,815	176,653	251,427	76,684	657,387
Average 1966-74	89,263	117,466	252,423	348,327	112,783	920,222

Table 18. Number of chinook salmon landed, by area, in the Oregon commercial troll fishery, 1966-75.

Year	Area					Total
	Astoria to Tillamook Head	Tillamook Head To Cascade Head	Cascade Head To Heceta Head	Heceta Head To Cape Blanco	Cape Blanco To California	
1966	20,027	1,890	15,684	26,506	16,753	80,860
1967	19,761	3,613	17,486	35,300	23,589	99,749
1968	22,481	5,186	9,040	55,137	18,306	110,150
1969	10,639	5,096	14,510	70,721	39,319	140,285
1970	25,208	4,889	24,491	62,670	46,111	163,369
1971	16,060	3,012	8,545	17,659	57,650	102,926
1972	8,848	4,102	19,881	40,196	54,260	127,287
1973	8,613	7,702	96,683	195,549	54,720	363,267
1974	17,705	7,515	37,581	126,023	35,286	224,110
1975	10,955	5,848	24,209	113,047	70,649	224,708
Average 1966-74	16,594	4,778	27,100	69,973	38,444	156,889

Table 19. Number of pink salmon landed, by area, in the Oregon commercial troll fishery, 1966-75.

Year	Area: Astoria to Tillamook Head	Tillamook Head To Cascade Head	Cascade Head To Heceta Head	Heceta Head To Cape Blanco	Cape Blanco To California	Total
1966						1/
1967						201,239
1968	83	154	0	542	0	779
1969	2,008	8,016	22,656	17,197	7,806	57,683
1970	63	0	76	52	3	194
1971	23	5	628	855	499	2,010
1972	0	0	4	21	0	25
1973	933	1	24	1,315	888	3,161
1974	1	0	7	8	13	29
1975	88	0	67	15	22	192
Average 1968-74	444	1,168	3,342	2,856	1,316	9,126

1/ None reported.

recovered from fish originating in the Sacramento River and Washington coastal streams.

STEELHEAD

This section discusses the steelhead stocks entering the Columbia River and Oregon coastal rivers and reviews the 1975 recreational and commercial catch.

COLUMBIA RIVER STOCKS

The various steelhead stocks in the Columbia River system range from relatively healthy status to very critical status. Summer steelhead stocks destined for tributaries of the Snake River in Idaho and Oregon are in very poor condition. Winter steelhead runs into lower Columbia River tributaries fluctuate but remain basically healthy. Counts of steelhead passing over Columbia and Willamette river dams and numbers of fish returning to Oregon hatcheries in 1975 are shown in Table 20.

Legislation in 1969 designating steelhead a game fish and a successful initiative petition in 1974 banning the commercial sale of steelhead in Oregon has resulted in the near elimination of commercial landings of steelhead by non-Indian gillnetters. The 1974 initiative also required that steelhead caught by commercial fishermen be turned over to the state for use at public institutions. Compliance with this requirement has been poor, resulting in no available estimates of the number of steelhead caught by commercial gillnetters. The steelhead laws do not apply to Treaty Indian fishermen.

Summer Steelhead

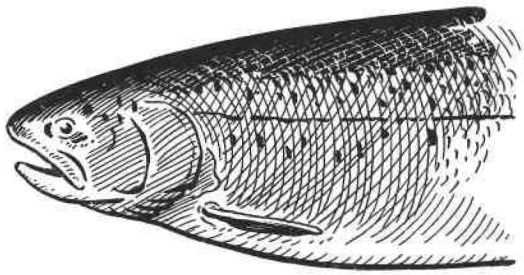
Status: Summer steelhead stocks destined for tributaries of the Snake River are in critical condition. The 1975 Bonneville Dam count of 75,514 summer steelhead was about one-half of the past 5-year average and the poorest count on record. The Ice Harbor Dam count of 15,245 steelhead was almost one-third of average and also the poorest count on record. The single largest factor contributing to the poor steelhead runs is the mortality of juveniles as they migrate downstream through eight successive main river hydroelectric projects.

Summer steelhead stocks from mid-Columbia tributaries such as the John Day, Deschutes, and Hood rivers are in a healthier condition. These fish have fewer dams to pass and there is a limited sport and commercial (Indian) fishey on returning adults in the main stem Columbia.

Table 20. Indices of abundance of adult steelhead in the Columbia River system in 1975 and past 5-year averages.

Index	Summer Steelhead 1975	Summer Steelhead Average (1970-74)	Winter Steelhead 1975	Winter Steelhead Average (1970-74)
DAM COUNTS				
Columbia River				
Bonneville	75,514	151,840		
Ice Harbor	15,245	44,200		
Willamette River				
Willamette Falls	2,910	1,900	6,130	17,360
North Fork	2,326	370 1/	1,456	2,575
Foster	1,052	2,230 2/	347	1,850
Leaburg	224	60	11	10
Fall Creek			132	460
HATCHERIES				
Columbia River				
Klaskanine			1,406	1,210
Big Creek			2,343	2,650
Willamette River				
Marion Forks			287	385
South Santiam	1,494	570 1/		
FISH TRAPS				
Deschutes River				
Pelton Trap	7,065	2,800		

1/ Three-year average.
2/ Four-year average.



The 1975 Willamette Falls fishway count of 2,910 summer steelhead was well above the 5-year average of 1,900 fish. Over 2,300 summer steelhead passed over North Fork Dam into the upper Clackamas River and provided a newly developed fishery for anglers near the Portland metropolitan area.

Recreational Harvest: The sport catch of summer steelhead in the Columbia River and its tributaries was the poorest in the past 10 years as only 12,715 fish were caught (Table 21). Best angler success occurred in the Deschutes and Hood rivers and in tributaries below Bonneville Dam. The main stem Columbia and the Snake River and its tributaries were closed to angling in order to protect the depleted Snake River run.

Commercial Harvest: The Indian fishery has traditionally harvested summer steelhead during the summer sockeye and shad seasons and during the fall salmon season. As the Indian set-net fishery rapidly expanded in the late 1960's the steelhead catch increased dramatically and reached a peak of 28,800 fish in 1972. However, poor adult returns in both 1974 and 1975 made it necessary to impose a minimum mesh restriction (7½ inches) on the Indian set-net fishery during the 1975 fall season. Consequently, the steelhead catch dropped to 6,400 fish, a result of both the mesh restriction and the worst run in history. An additional 276 summer steelhead were taken during their winter salmon fishery.

An estimate of the incidental summer steelhead catch made by lower river gillnetters is not available as none were landed at the receiving stations.

Winter Steelhead

Status: Most winter steelhead returning to the Columbia River spawn in tributary streams below Bonneville Dam. The most important Oregon tributaries are the Willamette and Sandy river systems. Tagging studies conducted during the 1950's indicated a run size of about 220,000 fish returning to the Columbia River. Recent estimates of abundance have not been made. However, based on increased hatchery production, the increasing sport catch, and a few isolated indices such as hatchery returns and dam counts, it is believed the run may now approach 400,000 fish.

The 1975 Willamette Falls fishway count of 6,130 winter steelhead was considerably below the past 5-year average count of 17,360 fish (Table 20). The North Fork Dam (Clackamas River) count of 1,600 fish was also below average while returns to Klaskanine and Big Creek hatcheries were about average.

Recreational Harvest: Angling for winter steelhead in the Columbia River system produced the second best catch in the past 10 years with 28,350 fish taken (Table 22). The Sandy River

Table 21. Sport catch of summer-run steelhead in the Columbia River system, 1966-76. 1/

Stream	Run Year 1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Columbia River System										
Catherine Creek	0	0	0	0	8	0	4	12	0	0
Clackamas River (Eagle Creek)	0	0	0	0	0	0	582	--	--	--
Clackamas River	0	0	0	0	0	0	--	359	576	1,061+
Columbia River (Lower)	15,815	10,148	12,640	8,907	6,520	10,801	6,988	5,902	3,839	0
Columbia River (Upper)	7,222	6,227	3,470	1,655	1,943	1,829	1,716	1,568	825	0
Deschutes River	5,460	5,958	10,181	9,735	9,205	13,367	14,829	8,437	10,400	7,133+
Eagle Creek (Clackamas)	0	0	0	0	0	0	--	476	51	60
Grande Ronde River	2,080	1,039	621	1,319	743	510	832	133	16	0
Hood River	1,351	1,359	1,428	1,321	1,698	899	1,045	1,395	2,307	1,766+
Imnaha River	842	615	1,105	667	473	638	609	280	16	0
John Day River	4,566	3,521	2,882	2,667	1,789	2,666	5,359	906	2,784	1,124+
McKenzie River	--	--	--	--	--	--	23	24	366	610
Minam River	44	71	93	34	65	35	4	26	0	0
Santiam River	--	--	--	--	--	452	283	204	1,745	129+
Santiam River, N. F.	--	--	--	--	--	--	--	--	--	384+
Santiam River, S. F.	--	--	--	--	--	--	--	--	--	91+
Snake River	1,330	785	1,466	1,154	715	1,207	857	332	26	0
Umatilla River	1,237	560	775	803	1,307	735	1,913	326	338	107+
Walla Walla River	199	23	58	19	76	126	73	31	40	0+
Wallowa River	343	220	80	214	97	36	52	74	0	0
Wenaha River	84	20	52	20	87	33	6	12	13	0
Willamette River	--	--	--	--	--	--	128	85	147	250
Total	40,573	30,546	34,851	28,515	24,726	33,334	35,299	20,582	23,489	12,715+

1/ Estimates from 1971 on are corrected for bias.

Table 22. Sport catch of winter-run steelhead in the Columbia River system, 1966-76. 1/

Stream	Run Year 1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Columbia River System										
Bear Creek	--	56	92	61	35	23	0	0	13	9+
Big Creek	3,364	3,371	3,948	2,068	2,973	3,946	2,333	2,080	3,705	1,454+
Calapooia River	114	104	59	104	205	169	182	51	33	0+
Clackamas River (Eagle Creek)	2,173	4,694	4,650	2,528	5,221	8,856	--	--	--	--
Clackamas River	--	--	--	--	--	--	2,612	1,628	4,753	698+
Clatskanie River	528	491	578	700	692	673	271	686	1,027	790+
Columbia River (Lower)	3,441	2,118	2,114	1,264	2,010	930	896	507	725	79+
Eagle Creek (Clackamas)	--	--	--	--	--	--	1,697	1,095	2,418	347+
Gnat Creek	328	226	167	218	240	351	250	319	668	193+
Johnson Creek	15	44	58	46	35	19	12	10	32	0+
Klaskanine River	1,273	2,707	2,327	991	1,723	1,833	1,531	2,531	2,927	1,672+
Lewis and Clark River	250	212	219	153	288	345	189	164	566	167+
McKenzie River	66	12	10	0	12	34	0	0	0	0+
Molalla River	229	260	314	189	494	323	570	419	589	32+
Sandy River	6,331	4,986	5,185	5,425	8,647	10,315	5,640	5,937	8,738	3,472+
Santiam River	1,188	417	941	580	2,035	1,224	1,528	698	679	16+
Santiam River, N. F.	--	--	--	--	--	--	--	--	321	12+
Santiam River, S. F.	--	--	--	--	--	--	--	--	64	0+
Scappoose Creek	116	50	139	50	153	56	22	59	101	9+
Sucker Creek	56	60	4	0	92	35	6	21	5	0+
Willamette River	1,252	1,232	862	651	1,447	2,256	1,415	823	986	321+
Total	20,724	21,040	21,667	15,028	26,302	31,388	19,154	17,028	28,350	9,271+

1/ Estimates from 1971 on are corrected for bias.

continued to provide the highest catch followed by the Clackamas River and Big Creek.

Commercial Harvest: A minimum 8-inch mesh restriction was imposed during the 1975 commercial winter salmon season in order to minimize the incidental catch of winter steelhead. Fifty dead steelhead were turned in by fishermen during the season.

COASTAL STOCKS

There are few reliable indices of abundance of summer and winter steelhead in Oregon's coastal streams. Spawning counts are difficult to obtain due to high water conditions and the extended spawning period which lasts throughout the entire winter and early spring. The recreational catch is not a reliable index as the catch is affected by water conditions during the peak of the run.

Summer Steelhead

Status: The Umpqua and Rogue rivers continue to produce the major wild runs of summer steelhead on the coast. The Siletz River run has been rebuilt and is now sustained by releases of hatchery smolts. Hatchery production also maintains introduced runs in the Nestucca and Wilson rivers.

The 1975 count of 9,146 summer steelhead over Winchester Dam (Umpqua River) was below the past 5-year average count of 12,600 fish. However, the count over Gold Ray Dam (Rogue River) of 8,338 steelhead was an all-time high and exceeded the past 5-year average count by almost 3,000 fish. Underwater surveys of resting holes in the Siletz River revealed 783 fish, the second highest count in the past 15 years.

Recreational Harvest: Anglers harvested 24,467 summer steelhead in coastal tributaries during 1975 (Table 23). Best catches occurred on the Nestucca, Siletz, Rogue, and Umpqua rivers.

Commercial Harvest: Commercial harvest of summer steelhead is not permitted in coastal streams.

Winter Steelhead

Status: Winter steelhead runs into most coastal streams have fluctuated from year to year but are maintained at fairly stable levels by releases of hatchery smolts. Adult returns to the Alsea Hatchery were above average in 1975, probably due to poor water conditions which limited fishing effort below the hatchery. The count of 6,109 steelhead over Winchester Dam was the poorest recorded count since 1963 and considerably less than the past 5-year average count of 9,420 fish. The Gold Ray Dam count of

Table 23. Sport catch of summer-run steelhead in Oregon coastal streams, 1966-76. 1/

Stream	Run Year 1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Coastal Tributaries										
Alsea River & Bay	690	225	153	159	154	154	128	126	129	198
Applegate River	347	646	305	543	480	291	274	124	953	0+
Drift Creek	12	0	14	21	10	19	17	8	4	23
Illinois River	80	122	71	38	189	69	41	62	150	120
Kilchis River	25	6	13	11	5	38	29	8	10	293
Miami River	4	0	0	0	10	4	0	8	8	19
Nestucca River & Bay	1,373	1,503	3,733	2,947	3,599	3,666	4,223	2,611	6,688	5,349+
Nestucca River, Little	--	--	17	8	5	22	6	0	27	21
Rock Creek	13	1	41	46	53	72	149	30	0	0
Rogue River	3,679	4,161	2,756	4,490	4,334	6,242	3,659	1,943	6,939	4,149
Salmon River	168	70	151	95	260	353	196	59	153	273
Siletz River & Bay	2,851	1,955	2,999	2,680	3,740	6,172	3,601	2,976	6,096	5,529+
Smith River	66	20	18	11	22	17	24	0	15	6
Tillamook Bay	9	15	14	12	14	0	0	4	0	0
Tillamook River	4	0	10	21	1	3	13	7	53	6
Trask River	286	241	303	306	846	893	656	423	745	691+
Umpqua River & Bay	1,496	813	1,584	1,815	3,723	3,091	3,598	1,183	3,908	1,535
Umpqua River, N. F.	1,717	1,910	2,520	4,802	7,011	6,352	8,294	3,256	4,007	3,749
Umpqua River, S. F.	--	--	0	8	42	5	6	4	0	0
Wilson River	217	60	100	148	1,163	2,345	1,819	1,016	2,404	2,506+
Total	13,037	11,748	14,802	18,161	25,661	29,808	26,733	13,848	32,389	24,467+

10,367 fish was slightly below the past 5-year average of 11,340 fish.

Recreational Harvest: The 1975 winter steelhead sport catch from coastal streams totaled 112,409 fish, the second highest catch recorded in the past 10 years (Table 24). Anglers on the Rogue River experienced exceptional success with a reported catch of 23,296 fish, almost double the annual harvest made during the past 10 years. Although the Alsea River catch was below average, other major streams like the Nestucca, Wilson, Umpqua, and Coquille had average or above-average angling success.

Commercial Harvest: Commercial harvest of winter steelhead is not permitted in coastal streams.

SHAD

COLUMBIA RIVER STOCKS

Status: American shad have flourished in the Columbia River since their introduction in the 1870's. Shad migrations were confined to the area below Celilo Falls until 1957 when The Dalles Dam was completed and submerged the falls. The dam allowed shad to extend their range upstream to over 643.6 km (400 miles) from the river mouth and the impoundments behind the dams have provided suitable spawning and rearing habitat. The highest run recorded into the Columbia River occurred in 1965 when over 617,000 shad were counted past Bonneville Dam. In 1975 many shad apparently used the navigation lock to pass Bonneville Dam instead of the fish ladders as the count at The Dalles Dam (438,000 shad) exceeded the Bonneville count (264,200 shad).

Recreational Harvest: Angling for shad primarily occurs in the Camas to Bonneville Dam area of the Columbia River and below the falls on the Willamette River. Accurate sport catch estimates are not available for most areas due to the lack of creel sampling effort. Catch estimates for the lower Columbia River have ranged between 10,000 and 15,000 shad during the past 5 years. The 1975 Columbia River sport catch was estimated to be 14,500 fish. Although catch estimates are not available for the Willamette Falls area, the catch may be as large as in the Columbia.

Commercial Harvest: Prior to 1965, shad were commercially harvested during the regular summer salmon seasons in June and July. With the last of the summer seasons in 1964, shad have since been harvested during short shad and sockeye salmon seasons. Gear restrictions have been imposed during these seasons to protect summer chinook. General shad seasons were not established in 1974 and 1975 due to the continuing decline of the summer chinook runs; however, approximately 73,000 shad were harvested by special area and permit fisheries (Table 25).

Table 24. Sport catch of winter-run steelhead in Oregon coastal streams, 1966-76. 1/

Stream	Run Year 1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Coastal Tributaries										
Alsea River & Bay	11,359	14,496	12,181	8,012	16,773	11,977	7,299	11,631	8,333	5,305
Applegate River	1,484	1,281	1,108	1,317	1,529	799	931	151	1,549	0+
Beaver Creek	185	65	89	56	62	49	30	72	120	61+
Big Elk Creek (Yaquina System)	--	--	--	--	--	--	--	--	656	336+
Chetco River & Bay	1,688	1,320	1,277	1,612	2,591	2,168	3,205	2,954	3,506	663+
Coos River & Bay	887	764	737	518	950	956	477	618	1,240	375+
Coquille River & Bay	3,651	2,193	1,926	2,621	8,023	4,189	5,577	5,543	5,927	3,033+
Devils Lake	9	10	0	39	13	31	19	8	50	0+
Drift Creek	1,369	1,946	1,961	895	1,319	718	670	1,386	1,173	517+
Elk River	1,408	1,026	1,214	1,086	1,867	1,745	1,554	1,951	1,571	369+
Euchre Creek	--	36	42	56	56	54	118	68	82	9+
Floras Creek	352	291	41	334	537	220	--	--	--	--
Floras Creek and New River	--	--	--	--	--	--	188	174	174	111+
Hunter Creek	301	336	654	244	420	164	212	207	153	69+
Illinois River	1,103	2,072	3,204	2,395	3,444	2,699	1,893	2,491	2,815	527+
Kilchis River	794	1,549	1,492	936	2,302	1,748	878	1,683	2,194	774+
Miami River	307	136	248	133	160	272	545	628	708	171+
Millicoma River (Middle Fork Coos)	504	298	435	287	610	999	1,194	1,589	1,182	434+
Necanicum River	810	619	952	1,203	2,061	1,411	1,476	1,736	1,834	397+
Nehalem River & Bay	3,064	4,257	5,255	5,241	6,317	4,502	4,692	1,193	1,349	441+
Nehalem River, N. F.	--	--	--	--	--	--	--	2,704	3,279	1,340+
Neskowin Creek	201	132	174	139	165	177	42	113	61	37+
Nestucca River & Bay	8,547	12,680	12,311	8,589	14,362	12,619	10,453	10,281	13,454	5,272+
Nestucca River, Little	--	--	--	254	360	482	505	485	517	132+
Pistol River	269	281	372	189	282	204	252	254	284	180+
Rock Creek	77	50	77	79	79	187	326	58	67	29+
Rogue River	9,409	12,968	9,963	12,883	11,201	13,939	13,200	5,674	23,296	6,991+
Salmon River	2,548	3,307	3,459	2,122	4,815	4,339	1,975	2,742	2,702	900+
Salmonberry River	258	240	195	284	474	166	111	130	100	28+
Siletz River & Bay	3,478	5,536	4,189	3,597	6,242	4,807	4,937	4,897	4,937	1,423+
Siltcoos Lake	68	10	82	39	18	27	44	24	22	23+
Siuslaw River & Bay	2,775	6,331	6,456	3,141	7,186	6,122	3,773	7,355	4,793	2,022+
Sixes River	660	448	346	226	612	457	402	287	626	379+
Smith River	716	1,194	1,435	914	1,969	2,006	989	1,547	1,236	422+
Tahkenitch Lake	5	14	0	13	5	--	0	4	4	9+
Tenmile Creek & Lakes	829	867	--	--	--	--	--	--	--	--
Tenmile Lakes	--	--	356	122	131	120	136	85	46	10+
Tenmile Creek	--	--	507	609	691	1,071	652	515	448	135+
Tillamook Bay	129	194	270	109	112	146	30	58	12	0+
Tillamook River	87	63	114	178	502	413	302	857	1,197	386+
Trask River	3,385	3,362	4,219	4,226	6,859	4,133	3,186	1,739	3,000	653+
Umpqua River & Bay	5,205	5,556	6,690	5,627	7,083	6,128	4,471	3,167	6,795	2,415+
Umpqua River, N. F.	976	1,897	1,814	1,972	1,953	2,359	1,389	793	1,419	373+
Umpqua River, S. F.	--	629	656	385	533	122	611	240	584	152+
Wilson River	10,440	13,034	7,238	6,441	13,363	10,881	6,261	6,846	8,221	2,565+
Winchuck River	200	237	414	440	848	303	384	380	387	120+
Yachats River	474	249	439	242	172	176	106	142	147	24+
Yaquina River & Bay	216	136	95	53	89	87	36	16	159	28+
Total	80,227	102,110	94,687	79,858	129,140	106,172	85,531	85,476	112,409	39,640

1/ Estimates from 1971 on are corrected for bias.

Table 25. Commercial landings (in thousands of fish) of sturgeon, shad, and smelt from the Columbia River by non-Indian and Indian fisheries, 1965-75.

Year	Sturgeon [1]			Shad		Smelt [2]
	White					
	Non-Indian	Indian	Green	Non-Indian	Indian	(Pounds)
1965	3.8	0.2	0.9	87.2	7.4	910.8
1966	4.9	0.1	2.0	205.5	4.2	1,028.3
1967	3.8	0.2	1.3	221.8	5.7	1,000.8
1968	3.5	0.3	0.7	81.5	1.4	948.5
1969	7.3	0.4	2.0	45.5	2.1	1,090.1
1970	6.3	0.4	1.5	59.1	6.4	1,198.9
1971	7.0	0.8	1.5	40.3	6.7	1,761.7
1972	7.4	0.8	1.3	55.3	4.9	1,643.5
1973	9.7	1.0	1.0	49.1	4.8	2,434.4
1974	8.6	0.7	3.5	45.9	3.6	2,361.2
1975	11.4	0.7	1.2	64.5	8.5	2,071.7
Average (1965-74)	6.2	0.5	1.6	89.1	4.7	1,437.8

1/ Numbers of white sturgeon based on 40 lb./fish average weight; green sturgeon 35 lb./fish average weight.

2/ Total landings from Columbia River and tributaries.

COASTAL STOCKS

Status: Shad probably occur in most of Oregon's coastal streams with large populations being found in the Umpqua, Smith, Coos, Coquille, and Siuslaw rivers. The only index available to evaluate the populations is the magnitude of the sport and commercial catch. This information is not wholly reliable as the catch can be influenced by many factors. In recent years the commercial fishery has experienced a reduction in the areas open to fishing, gear restrictions, and variable effort. Sport effort also varies from year to year and an accurate estimate of the sport catch is usually not obtained.

Recreational Harvest: The coastal sport fishery for shad occurs primarily on the Coos and Umpqua rivers. Limited creel sampling conducted on the Coos River in 1975 revealed an average catch rate of 1.4 shad per angler and 2.8 hours per fish. Data from the 1975 Angler Survey indicated 4,045 angler days were expended on south coastal streams to catch 5,267 shad.

Commercial Harvest: A commercial shad fishery exists on the Siuslaw, Smith, Umpqua, Coos, and Coquille rivers. Set nets are used in all streams except the Umpqua where drift nets are used. The 1973 Legislature removed the commercial fish classification from striped bass and instructed the Department to reduce the incidental catch of bass in the shad fishery. As a result area, season, and net breaking strength restrictions were instituted in the shad fishery to protect striped bass. These restrictions have contributed to the reduction in shad landings during the past few years.

The combined landings from all streams averaged 226,800 kg (500,000 lb.) per year from 1950-72 but declined during the early 1970's to an average of 158,760 kg (350,000 lb.). The 1975 catch was below average as only 105,008 kg (231,000 lb.) were landed.

STURGEON

Sturgeon are found primarily in the Columbia River and its larger tributaries. They have also been reported in some of the coastal bays and rivers but little is known of these stocks.

COLUMBIA RIVER STOCKS

Status: White and green sturgeon are found in the Columbia River but the white sturgeon is the predominant species taken by both the commercial and recreational fishermen. White sturgeon stocks were in a healthy condition in the Columbia River until the early 1900's when overfishing depleted the number of larger spawning fish. The decline was rapid as sturgeon grow slowly,

mature at an advanced age, and do not spawn every year. Size limits imposed to protect the large spawners, as well as season restrictions on the commercial fisheries for other species, have reversed the declining trend and a relatively healthy population once again occurs in the river.

Recreational Harvest: The sturgeon sport fishery, concentrated mainly in the area below Bonneville Dam, has experienced increasingly good catches of white sturgeon over the past 3 years. In the spring and fall of 1975, an estimated 10,800 sturgeon were taken by sport anglers during the various sampling periods. This is not a total catch estimate but indications are that anglers took more sturgeon in 1975 than ever before.

Commercial Harvest: Prior to 1975, most sturgeon caught in the Columbia River were taken incidentally while fishing for other species. Landings from the below-Bonneville Dam fisheries have averaged about 6,200 sturgeon during the past 10 years (Table 25). Commercial fishermen, faced with severely curtailed salmon seasons, turned to setlining to harvest sturgeon for the first time in 1975. A special season was held from May 1 to May 31 and a catch of 547 sturgeon was reported. This catch, when combined with landings made during other open seasons, gave a total 1975 catch of 11,400 fish. The large catch, made despite reductions in fishing time, indicates the general good health of the sturgeon population. Approximately 700 sturgeon were landed in the Indian fisheries above Bonneville Dam during 1975.

STRIPED BASS

COASTAL STOCKS

Status: Striped bass occur in many of Oregon's central and south coastal estuaries with the major populations found in the Siuslaw, Smith, Umpqua, Coos, and Coquille rivers. They are subjected to an intensive recreational fishery and, until 1975, a commercial fishery. Two independent Department studies conducted in 1972 estimated the number of bass in the catchable population to be between 50,000 and 70,000 fish. A 1973 study showed a drop in the population to about 35,000 fish. The decrease was not unexpected as fish from the dominant 1966 brood year were being removed from the population by both natural and fishing mortality. Population estimates have not been made since 1973, but the absence of any real dominant brood years has probably resulted in recruitment to the fisheries each year of about 35,000 or less.

Recreational Harvest: Angling for striped bass is open the entire year although most fish are caught in the spring and summer months. The 1975 Angler Survey showed an estimated catch of 5,413 striped bass from coastal streams. Approximately 80% of the total catch occurred in the Umpqua-Smith River estuary.

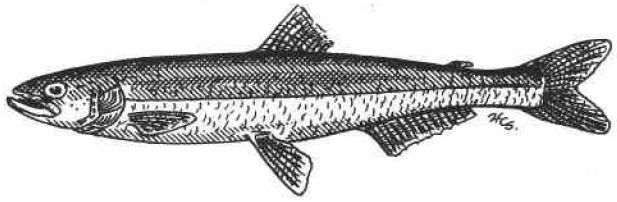
SMELT

COLUMBIA RIVER STOCKS

Status: The annual upstream migration of Columbia River smelt or euchalon begins in late November and usually peaks in February. Millions of fish ascend the river to spawn in the main stem or glacier-fed tributaries and ultimately die. Smelt runs have increased in the past few years and the outlook is for continued good runs.

Recreational Harvest: Sport dipping for smelt is enjoyed by many people in the Sandy River and main stem Columbia below Bonneville Dam. All time and area restrictions regulating dipping were removed in Oregon in 1975; however, dippers are limited to 11.3 kg (25 lb.) of smelt per day. No estimate of the sport catch is available.

Commercial Harvest: Smelt are commercially caught by gill net, trawl, and dip net in the main stem Columbia River and by dip nets in the Cowlitz River in Washington. In 1975, more than 907,200 kg (2 million lb.) of smelt were commercially landed from the Columbia River and its tributaries (Table 25). Virtually the entire harvest was from the Cowlitz River.



RESIDENT FISH

Resident game fish provide more angling recreation than any other category of fish in the state. The 1975 Oregon Angler Survey revealed that resident species were the object of over 64% of the total angling effort. Trout or warm-water game fish reside in over 6,000 streams and 1,700 lakes and reservoirs in the state.

TROUT

Trout angling accounted for over 55% of the total angling experience in 1975. Trout occur in a variety of waters throughout the state and populations are generally capable of supporting the intensive recreational fisheries that occur. Where wild stocks are not able to sustain the fishery, artificial production is used to maintain or enhance existing stocks or to develop new populations. This section describes the resident trout program in the 17 drainage basins of the state by presenting catch and effort data for selected streams and impoundments.

NORTH COAST BASIN

Resident trout management in the North Coast basin consists of stocking yearling trout into standing water bodies to primarily accommodate an opening weekend fishery.

During 1975, 15 lakes and reservoirs were stocked with approximately 57,000 yearling trout. Limited creel data revealed an overall angler success of 1.9 fish per angler and 0.5 fish per hour.

MID-COAST BASIN

Resident trout management in mid-coastal lakes consists of stocking yearling trout to totally maintain the fishery or to supplement an existing fishery, such as warm-water game fish. Approximately 96,000 yearling trout were stocked into lakes of the Mid-Coast basin in 1975.

WILLAMETTE BASIN

Resident trout management in the Willamette basin consists of managing the existing trout populations and stocking hatchery fish into selected stream sections or impoundments to provide a satisfactory recreational trout program. The Department's Research Section conducted a number of creel sampling programs

in 1975 to evaluate the hatchery release of catchable sized trout in the basin.

Little Luckiamute River

A catchable trout evaluation study was conducted on a 6.4 km (4-mile) section of the river for a 10-week period. The river was stocked with 6,500 rainbow trout and angler catch and effort were subsequently measured. An estimated 6,400 anglers fished in the survey area and harvested 82% of the stocked fish. Angler success averaged 0.8 fish per angler and 0.6 fish per hour. Thirty-two percent of the anglers failed to catch a fish.

McKenzie River

Statistical creel sampling was not conducted on the river in 1975. However, licensed guides provided the following information:

	1975	1974	10-year Average
Guided trips	375	290	
Anglers	535	572	
Hours	3,836	4,043	
Trout creeled	3,336	4,113	
Trout over 14 inches released	208	146	
Fish per angler	6.2	7.2	6.8
Fish per hour	0.9	1.0	1.0

Mill Creek (Yamhill System)

A catchable trout evaluation study was conducted by the Research Section on a 16.1 km (10-mile) section of the stream. During a 10-week period 4,200 anglers caught 64% of the 58,000 rainbow trout previously stocked. The catch rate was 0.9 fish per angler and 0.5 fish per hour. Twenty-five percent of the anglers failed to catch a fish.

Quartsville Creek (Middle Santiam River)

A catchable trout evaluation program was conducted on a 19.3 km (12-mile) section of the stream. The stream was stocked with 13,000 rainbow trout and, during a 10-week period, 9,800 anglers harvested 83% of the fish. The overall catch rate was 1.0 fish per hour and 1.1 fish per angler. Twenty-five percent of the anglers failed to catch a fish.

South Santiam River

A catchable trout evaluation program was conducted on three sections of the river. The study covered a 10-week period and the following information was collected:

Section 1 (above Foster Reservoir): Thirty-two kilometers (20 miles) of river were stocked with 18,500 catchable sized rainbow trout. Anglers harvested 83% of the stocked fish for an average catch rate of 1.0 fish per hour and 0.4 fish per angler.

Section 2 (Foster Reservoir): The reservoir was stocked with 24,000 catchable sized rainbow trout. Sixty-eight percent of the fish were harvested during the study with most being caught the first week after stocking. None of the stocked fish were recovered after the eighth week of sampling. Boat anglers experienced a higher catch rate than did bank anglers. Overall angler success averaged 0.3 fish per hour. Fifty-five percent of the anglers failed to catch a fish.

Section 3 (below Foster Dam): This section of stream was not stocked and a creel census was conducted from Foster Dam downstream 6.4 km (4 miles). Angler success was low as only 23% of the anglers interviewed caught 1 or more fish.

Willamette River - Middle Fork

The Research Section conducted an intensive evaluation of the catchable trout fishery on a 16.1 km (10-mile) section of the river. During the 10-week study period, 40,500 catchable sized trout were released into the study area. An estimated 22,500 anglers fished the area and caught 75% of the stocked fish. Boat anglers experienced the highest catch per angler while bank anglers had the highest catch per hour. Average catch rate for all anglers was 1.3 fish per angler and 1.0 fish per hour. Twelve percent of the anglers caught their limit of fish while 23% failed to catch a single fish.

Willamette River - North Fork

The stream is presently being managed for a wild trout fishery and has not been stocked with hatchery fish since 1973. An Oregon State University student is currently conducting a study to evaluate this wild trout management program. Biological, physical, and angler use data are being gathered as part of this study. Stocking and catch rates for the past several years follow:

Year	Yearling Trout Stocked per Year	Catch Rate	
		Fish per Angler	Fish per Hour
1963-72	14,700	1.9	0.6
1973	4,000	1.1	0.5
1974 & 1975	none	0.8	0.4
1975 only	none	1.5	0.8

Blue Star Pond

This small pond located near Eugene was stocked with 2,000 legal sized rainbow trout the night before trout season opened. A total creel sample was carried out for the first 8 days of the season. During this period 1,611 anglers fished a total of 3,500 hours. By the end of the eighth day, 76% of the trout stocked had been harvested. The overall catch rate was 0.4 fish per hour and 1.0 fish per angler. Four percent of the anglers caught their limit of trout while 61% failed to catch a fish.

Gold Lake

An attempt was made to balance the rainbow and brook trout populations at Gold Lake by curtailing brook trout recruitment. Spawning tributaries were blocked off and all brook trout less than 25 cm (10 inches) in length were removed and transported to Waldo Lake. Approximately 1,900 small fish were transported and an additional 866 large fish were returned to Gold Lake.

Henry Hagg Lake

Angler use was heavy on this new impoundment located in Washington County. The lake was stocked with fingerling rainbow trout and supplemented with yearling trout to provide a fishery through early July.

The angler success rate of 0.4 fish per hour and 1.2 fish per angler was not considered good; however, a number of carry-over trout contributed to the fishery and most anglers were pleased.

High Lakes

In the Willamette basin 242 high mountain lakes were aerially stocked with 280,000 fingerling trout. Water samples were collected from a number of the lakes and analyzed for conductivity, total dissolved solids, and alkalinity - all parameters related to fish productivity.

Smith Reservoir

Smith Reservoir is managed by stocking fingerling and yearling rainbow trout. During 1974 a return of 4.8 fish per angler and 1.0 fish per hour was realized from a stocking of 14,500 yearling rainbow. In 1975, the stocking rate was increased to 19,000 yearling trout. Limited creel sampling revealed the catch rate to be 0.8 fish per angler and 0.3 fish per hour.

Timothy Reservoir

Angler catch continued to be poor at Timothy Reservoir although the brook trout population appears to be healthy. Kokanee remained small in size, maturing at 18 to 20 cm (6 to 8 inches) in length.

Catchable Trout Fisheries

Approximately 581,000 yearling trout were stocked into an additional 43 streams or stream segments to provide a put-and-take fishery. The combined average catch rate on these streams was 1.9 fish per angler and 0.6 fish per hour.

Twenty-six standing water bodies were stocked with 275,000 legal sized trout. Creel sampling of 1,380 anglers revealed an average catch rate of 1.9 fish per angler and 0.6 fish per hour.

UMPQUA BASIN

The resident trout management program in the Umpqua basin consists of managing the existing trout populations and stocking hatchery fish into streams or impoundments to provide a satisfactory trout program.

Umpqua Basin Streams

Approximately 82,000 yearling rainbow trout were stocked into Calapooya Creek, Cow Creek, Little River, and the North and South Umpqua rivers to provide a put-and-take fishery. Creel sampling of 542 anglers revealed an average catch rate of 1.5 fish per angler and 0.9 fish per hour.

Diamond Lake

Creel sampling at Diamond Lake revealed a 4% increase in the number of anglers (107,000) and a 21% decrease in the trout catch (231,000 trout) compared to the previous 5-year average. Anglers averaged 2.2 fish per angler trip and 0.5 fish per hour.

In 1975, the lake was stocked with 300,000 rainbow fingerlings. An additional 100,000 fingerlings will be stocked in 1976 in order to compensate for the heavy harvest of stocked fish during their first year in the lake. Bottom food production remains stable and should support the additional fish.

Lemolo Reservoir

Angler acceptance of new regulations designed to enhance a wild brown trout fishery appeared to be quite good. The regulations established a daily bag limit for brown trout of 3 fish with a minimum length of 30.5 cm (12 inches). A statistical creel sampling program revealed anglers harvested 1,545 brown trout (over 30.5 cm in length) in 13,291 hours of angling. The catch rate for fish kept by the anglers was 0.4 fish per angler and 0.1 fish per hour. An additional 2,735 trout less than 30.5 cm in length were caught and released.

Tokatee Reservoir

This new reservoir located east of Roseburg on the North Umpqua River was stocked with fingerling and yearling trout. Wild brown trout are also present in the reservoir. Eighty anglers checked during April and May experienced an average catch rate of 1.3 fish per angler and 0.6 fish per hour.

SOUTH COAST BASIN

Eel Lake

A resident trout population is maintained at Eel Lake by stocking fingerling and yearling cutthroat trout. Approximately 30% of all trout caught during the season are stocked fingerlings. A small population of kokanee is also found in the lake but few are caught. The overall average catch rate was 3.5 fish per angler and 1.1 fish per hour.

Powers Pond and Upper Empire Lake

These waters are managed primarily for warm-water game fish However, a few yearling trout are released to provide an early season trout fishery.

Tenmile Lakes

The 1975 trout catch was the poorest observed since the lakes were chemically treated in 1968. Angling pressure was subsequently low. The lakes management program is currently being changed from providing a trout fishery to providing a warm-water game fish fishery.

Other Waters

Approximately 30,000 yearling trout were stocked into five additional south coast lakes to provide a recreational fishery.

ROGUE BASIN

Approximately 76,000 yearling rainbow trout were stocked into streams in the Rogue system to provide a put-and-take fishery. Streams stocked included the Rogue, Applegate, and Illinois rivers and Big Butte and Sucker creeks.

Two-year-old precocial male summer steelhead, a by-product of a 2-year rearing program at Cole Rivers Hatchery (Rogue River) and yearling rainbow trout were stocked into one section of the Rogue River. Angler acceptance of the steelhead was favorable and creel sampling revealed they tended to bite as well as the rainbow.

Howard Prairie Reservoir

The reservoir is managed by releasing fingerling trout into the impoundment where they rear to catchable size. Angler success and population sampling data indicate a general decline in the trout population and an increase in the number of roach and warm-water game fish. The 1975 angler catch rate of 1.8 trout per angler and 0.7 trout per hour was below the success experienced in 1974. Although fewer anglers were checked in the creel census program than in previous years, the estimate of total angler use made by the Jackson County Parks Department was similar to last year (251,000 angler-days).

Hyatt Lake

Angler success (1.8 fish per angler) and catch rate (0.7 fish per hour) at Hyatt Lake were below those recorded in 1974. Finglerling brook and rainbow trout are stocked into the lake but few brook trout are caught. The brown bullhead population increased considerably from the previous year and comprised 26% of the total sport catch.

HOOD BASIN

Trout management in the Hood basin consists of stocking yearling trout during the early portion of the angling season. Three streams (East Fork Hood River, Neal Creek, and Odell Creek) were stocked with approximately 1,500 rainbow and 28,000 cutthroat trout. Kingsley Reservoir and Lost Lake were stocked with 13,000 and 19,400 yearling trout, respectively. Creel sampling of the basin lakes and reservoirs revealed an average catch of 0.6 fish per hour and 2.0 fish per angler. Stream angling was a little better as anglers averaged 1.2 fish per hour and 2.1 fish per angler.

DESCHUTES BASIN

Crooked River

The trout population in the Crooked River below Prineville Dam appears to be maintaining itself through natural reproduction. The 1975 angler catch rate of 0.3 fish per hour was below the previous 5-year average catch of 0.5 fish per hour. However, the lower catch rate can be explained by an increase in the number of anglers that reported releasing trout under 25 cm (10 inches) in length. The overall catch success was felt to be comparable to previous years although a decrease in average trout size was noted.

Deschutes River

Sections 1 and 2 - below Pelton Dam. The Research Section continued their electrofishing and tagging program in various sections of the river and found virtually no movement of tagged rainbow trout. They also found trout growth was slower in the upstream Pelton and Warm Springs area than in the downstream North Junction and Nena Creek study sections. The population estimate of trout, 2 years of age or older, was similar to previous years in all three sample sections.

The Nena Creek Section (RM 55.5-58.5) has good access, a daily bag limit of 6 trout, no terminal tackle restrictions, and is stocked with catchable sized trout. The 1975 population estimate for wild trout over 2 years of age was 1,500 trout per mile, compared to 1,160 trout per mile in 1974.

The North Junction (RM 67.5-72.5) and Warm Springs (RM 92.0-97.0) sections have limited access, a daily bag limit of 2 trout, terminal tackle restricted to lures and flies, and no stocking of catchable trout. These sections contained an estimated 2,451 and 1,852 trout per mile, respectively, in 1975. The 1974 estimates were 1,604 and 1,754 trout per mile.

Section 3 - Head of Lake Billy Chinook to Bend. The river is open to angling the entire year and has the potential of providing a major whitefish fishery during the winter months; however, angler use is light. Irrigation withdrawals during the summer months curtails the streamflow and angler activity.

Section 4 - Bend to Benham Falls. This stream section is managed primarily for a brown trout fishery although 4,000 yearling rainbow are stocked annually.

Section 5 - Top of Benham Falls to Wickiup Dam. Rainbow, brown and brook trout, kokanee, and whitefish are found in this section of the river. The management program consists largely of a put-and-take rainbow trout fishery.

Fall River

Electrofishing continued on Fall River to determine if the resident trout population has reestablished below the hatchery since the stream was chemically rehabilitated in 1973. Brown trout carry-over from 1973 yearling releases was good as was the carry-over of yearling rainbow trout. A few carry-overs from fingerling brook trout releases were also recovered. Yearling brook trout will be stocked into the river in 1976.

Metolius River

A statistical creel sampling program was conducted to determine total catch, effort, catch of hatchery yearling rainbow, and movement of hatchery fish. Unexpanded, preliminary data revealed: (1) 461 (3.8%) of the 12,000 tagged rainbow were recovered, (2) fish tend to either stay in the area of release or move quickly out of the system, and (3) there was little difference in rate of return between fly anglers and anglers fishing with unrestricted gear except during the month of August when a greater number of fish were taken in the area of unrestricted gear.

Big Lava Lake

Big Lava Lake is stocked annually with fingerling brook trout. Both spring and fall net population samples indicated the number of mature-age brook trout has declined. Fingerlings stocked in 1974 showed good growth; however, only 45% of the fish inventoried in the fall exceeded 30.5 cm (12 inches) in length.

Lake Billy Chinook

Limnological data collected from the reservoir in 1975 revealed about average nutrient values.

In 1968, the protozoan Ceratomyxa shasta was identified in rainbow collected from the reservoir and the infestation still appears to be seriously affecting the trout population.

Most rainbow caught in the lake were legal sized trout which had been released in the Metolius River above the reservoir and subsequently moved downstream and entered the lake. Kokanee salmon comprised 39% of the angler catch.

Crane Prairie Reservoir

The 218 anglers sampled in 1975 caught 219 fish (rainbow and brook trout, kokanee, and coho) at a rate of 0.3 fish per hour.

The reservoir management objective is to produce a catch rate of 1.0 fish per hour.

Inventory net sampling showed little change in the overall composition of the salmonid population from the 1974 level. Roach and whitefish comprised 86% of the net samples and these populations are prohibiting us from reaching the management goal.

Davis Lake

Angler use was down on Davis Lake as a result of motors being banned for trolling. The regulation was initiated in 1974 in an attempt to reduce angler use in order to maintain a quality lake fishery in the face of an increasing roach population. The objective has been accomplished to some extent as 53% of the trout creeled were rainbow over 38 cm (15 inches) in length. In 1974 only 19% of the trout exceeded 38 cm.

Creel boxes have been used for several years at Davis Lake to obtain voluntary creel information from anglers. The 1975 sampling program confirmed that catch results obtained from creel boxes are slightly inflated as successful anglers tend to provide information more than unsuccessful anglers.

East Lake

The management objectives at East Lake are to provide an average angler catch of 0.75 fish per hour and 2.5 fish per angler and to have 90% of the yearling fish be in excess of 25.4 cm (10 inches) in length by July 4. In 1975 anglers were unable to fish the lake until after Memorial Day weekend due to ice cover. Consequently, the season catch and effort was down from previous years. Creel sampling revealed a catch rate of 0.4 fish per hour and 1.5 fish per angler. Both were well below the management objective and apparently resulted from the delay in fishing access. Approximately 87% of the rainbow creeled were in excess of 25.4 cm (10 inches).

Elk Lake

Limited creel sampling was conducted at Elk Lake in 1975. Net sampling revealed brook trout growth to be the best since 1971. The increased growth is probably due to brook trout not being stocked in the lake during the past 2 years. Although the total number of brook trout recovered was less than in 1974, natural reproduction is maintaining the population.

One hundred and sixty-four kokanee were captured during the fall trap net sample, the most ever recorded. Females averaged 23.1 cm (9.1 inches) in length, a slight size increase from the 1974 average.

Hosmer Lake

Atlantic salmon survival at Hosmer Lake continued to be poor. Four trap nights of fishing in the spring recovered only 29 salmon compared to a catch of 56 salmon in one trap night in 1974. Salmon stocked prior to 1973 were not recovered. Yearlings stocked in the spring of 1973 continued to show good survival but none of the other age classes were present in large enough numbers to support a good fishery. The sport catch of large fish has declined noticeably. In 1971 fish greater than 40.5 cm (16 inches) in length made up 98% of the sport catch while in 1975 only 11% of the catch was large fish.

Yearling salmon will continue to be stocked into the lake in an attempt to increase the population.

North Twin Lake

Angling was fair at the lake although few anglers were checked. Net sampling revealed a large number of kokanee available with most of these fish maturing at 24.1 cm (9.5 inches). Only 15% of the rainbow trout creeled exceeded 30.5 cm (12 inches) in length. Cutthroat trout are also present in the lake but they do not contribute significantly to the total catch.

Ochoco Reservoir

Angling pressure at Ochoco Reservoir was well above average in 1975. Random creel sampling of 240 anglers revealed 758 hours were expended to catch 469 rainbow trout for an average catch rate of 0.6 fish per hour. Sixty-three percent of the trout checked exceeded 30.5 cm (12 inches) in length.

Odell Lake

The Research Section continued the statistical creel sampling program on the lake. The study showed: (1) angler trips were down from 1974 by 5,000 visits, (2) angler hours were down by 22,000 hours, (3) the kokanee catch was down by 34,000 fish, (4) the lake trout catch remained stable with an estimated catch of 500 fish, and (5) about 72% of the season catch occurred between mid-May and mid-July.

Paulina Lake

Growth of rainbow trout hatchery fingerlings released into the lake in 1974 was fair as only 22% of the trout creeled through the July 4 (1975) weekend exceeded 25.4 cm (10 inches) in length. The management objective is to have 75% of the trout exceed this length by the holiday weekend.

Pinehollow Reservoir

Angling success was low as there was a poor carry-over of fingerling trout released in 1974. Fish from the 1975 spring fingerling plant began to enter the creel in late summer and older age-class fish gradually disappeared from the catch.

Prineville Reservoir

Creel data collected at the reservoir showed an angler catch rate of 0.2 fish per hour, the lowest ever recorded. However, the estimate may not be accurate as sampling was not evenly distributed throughout the season.

Population inventories were conducted three times during the year. Rainbow were recovered at an average rate of 7.8 fish per net set compared to the previous 10-year average of 14.4 fish per net. Rough fish comprised 56.9% of the net sample and were taken at a rate of 21.7 fish per net set. The past 10-year average catch of rough fish was 11.8 fish per net.

Lake Simtustus

Angling pressure was low at Lake Simtustus as both the main road and camping area were closed due to a slide on the hillside above the road and park. Limited creel sampling revealed anglers averaged 1.0 fish per hour with rainbow trout comprising 94% of the catch.

South Twin Lake

The lake is managed by releasing fingerling and yearling rainbow trout with the objective of providing an average catch rate of 1.0 fish per hour and 3.0 fish per angler. Creel sampling conducted from April through August revealed a catch rate of 0.3 fish per hour and 0.7 fish per angler, well below the management objective. Creel and net data indicate there is insufficient carry-over of fingerling fish to the following spring to meet angler demand.

Sparks Lake

Several severe winters, coupled with a reduction in the stocking level of brook trout, resulted in a poor trout catch at the lake in 1975. Anglers averaged 2.7 fish per angler and 0.9 fish per hour, well below the 5-year average of 3.5 fish per angler and 1.2 fish per hour. Growth has been poor as only 29% of the brook trout creeled were greater than 25.4 cm (10 inches) in length, the lowest average in the past 10 years.

Although the number of brook trout stocked has been reduced, there has not been an increase in the average size of the remaining fish as experienced at other reservoirs. Maturing females averaged only 20.9 cm (8.2 inches) in length in 1975, the lowest recorded average since 1963. The average length for the past 5 years was 23.6 cm (9.3 inches). Apparently the severe winter conditions, combined with the shallow depth of the lake, have resulted in poor fish growth.

Suttle Lake

Kokanee eggs were again collected from spawning fish in order to reduce the natural spawning potential. This program, combined with the elimination of stocking in 1973, has resulted in kokanee maturing at a larger size. The average length of spawning fish increased from 20.8 cm (8.2 inches) in 1973 to 28.2 cm (11.1 inches) in 1975.

High Lakes

The 1975 high lakes program consisted of aerial stocking, net inventories, limited creel sampling, obtaining new aerial photographs of the lakes, and collecting water quality information.

Net inventories revealed: (1) the discontinuance of brook trout stocking in 1973 and 1974 has resulted in excellent growth of resident fish in most lakes, (2) lakes managed with rainbow trout or brook and rainbow trout in combination have shown little adverse effects, and (3) the Long Tom inland cutthroat trout currently being stocked have shown poor survival but excellent growth.

Collection of water quality data (temperature, pH, conductivity, TDS, alkalinity, and hardness) continued. These parameters will be correlated with lake depth and elevation to further refine management techniques.

Wickiup Reservoir

Fish populations at Wickiup Reservoir are showing good recovery from 1973 when the low water level caused many fish to leave the reservoir through the outlet.

Angler success, although not as good as in 1973, improved as both kokanee and coho contributed 30% more to the total catch than in 1974. Anglers experienced a catch rate of 1.1 fish per angler and 0.4 fish per hour.

Catchable Trout Fisheries

Approximately 125,000 yearling trout were stocked into 13 other streams or stream sections in the Deschutes basin to provide a

put-and-take fishery. Overall angler success in these waters was 0.8 fish per angler and 0.4 fish per hour.

Approximately 80,000 yearling trout were released into 12 standing water bodies in the basin. Creel sampling revealed an average catch rate of 1.9 fish per angler and 0.6 fish per hour.

KLAMATH BASIN

Lake of the Woods

Angler success at Lake of the Woods was similar to 1974 in that anglers averaged 0.6 fish per angler and 0.3 fish per hour. The catch consisted of rainbow trout (53%), kokanee (30%), and brown bullheads (17%). The kokanee catch was surprisingly high since kokanee are not stocked into the lake. Size of maturing kokanee was up slightly from 1974 with fish maturing at 23.3 cm (9.2 inches). Brown bullheads appeared in the catch for the first time and the 17% contribution of this species indicates a rapidly expanding population.

Miller Lake

Kokanee have not been stocked into Miller Lake since 1971 but they continue to reproduce and provide the bulk of the catch. However, the fish are small, maturing at 20.8 cm (8.2 inches) in length. Zooplankton samples taken from the lake during July and August revealed less than 1% Cyclops (by volume), a usable food item, while Bosmina, an unusable food item, constituted 94% of the sample.

Lost River

Several Sacramento perch were caught in the river in 1975. The perch were originally stocked in Clear Lake, California, the source of Lost River, and may eventually infiltrate the entire Klamath River system.

Spring Creek

A trout spawning area was developed near the mouth of Spring Creek by placing 300 cubic yards of stream gravel behind a gabion structure. The area had been a traditional spawning site for trout but much of the spawning gravel had eroded away. About 1 month after the project was completed fall spawning rainbow and brook trout were observed using the area. Spring Creek is stocked annually with yearling rainbow trout.

Williamson River (including lower Sprague River)

The 1975 management program included creel sampling, tagging of trout, population trend counts, sampling the trout population in the Upper Williamson with electrofishing equipment, and monitoring the "mullet" run.

Trout anglers on the lower Sprague River (mouth to the dam) and Williamson River (mouth to the Chiloquin Bridge) were statistically sampled from May 24 through September 1. These areas were under a lure or fly-only terminal tackle restriction with a daily bag limit of two trout 30.5 cm (12 inches) or over in length. The following compares 1975 creel data with that of 1974:

	1975	1974
Anglers	4,180	4,493
Hours	11,539	19,724
Trout caught or released	1,948	2,050
Percent released	36	50
Fish per angler	0.5	0.5
Fish per hour	0.2	0.1

Since 1972, 484 rainbow trout have been tagged in the river as part of a migration and growth study. Data collected to date indicates that some fish migrate into Klamath Lake although few tags have been returned. Growth data shows trout average 15.2 cm (6.0 inches) in length at age 2, 25.6 cm (10.1 inches) at age 3, and 44.4 cm (17.5 inches) at age 4.

Underwater trend counts, made with the aid of scuba equipment, are conducted each August on a 5.6 km (3.5-mile) section of the Williamson River below the mouth of Spring Creek. In 1974, 250 rainbow trout and 43 redds were observed while, in 1975, 992 rainbow and 99 redds were observed.

The "mullet" run began on April 15 and ended in mid-May. Three separate species of suckers comprise this run as they migrate into tributary streams of Klamath Lake where they are harvested in the snag fishery. The 1975 catch consisted of 33% coarsescale suckers, 63% Lost River suckers, and 4% shortnose suckers. Coarsescale suckers enter the river first and are followed by the Lost River and shortnose suckers. Average size and weight of the fish taken were coarsescale, 46 cm (18 inches) and 1.4 kg (3 pounds); Lost River, 64 cm (25 inches) and 3.2 kg (7 pounds); and shortnose, 43 cm (17 inches) and 1.4 kg (3 pounds). Anglers averaged 1.6 fish per angler and 0.9 fish per hour. Twenty-five fish were tagged and released at the Sprague River Dam fish ladder trap to provide future information on movement and growth.

Catchable Trout Fisheries

Approximately 49,000 yearling rainbow trout were stocked into streams of the Klamath basin. These included the Klamath River, Sevenmile Creek, Spencer Creek, Sprague River, South Fork Sprague River, Spring Creek, Williamson River, and Wood River. Limited creel sampling revealed an average catch rate of 0.7 fish per hour and 1.8 fish per angler.

JOHN DAY BASIN

John Day River, South Fork John Day River, North Fork John Day River, Middle Fork John Day River, Rock Creek, Desolation Creek, Canyon Creek, and Camas Creek

These streams were all stocked with yearling trout. The combined average catch rate from all streams was 0.9 fish per hour and 1.8 fish per angler, slightly below that of 1974.

A 135.2 km (84-mile) section of the Middle Fork John Day was chemically treated in 1974 to remove squawfish and other nongame species. The section was subsequently restocked with fingerling rainbow trout. Posttreatment sampling at five locations in 1975 revealed the squawfish population has not increased since treatment. Rainbow and juvenile chinook have responded well as 53 rainbow and 14 juvenile chinook were taken at three sample locations compared to 2 rainbow and 0 chinook taken in 1974.

Bates Pond, Canyon Meadows Reservoir, Carpenter Pond, Dollarhide Pond, Long Creek Pond, and Rowe Creek Reservoir

These waters are stocked with yearling trout to provide a sport fishery. The combined average catch rate from all waters was 1.0 fish per hour and 2.4 fish per angler. Returns were comparable to those realized in 1974.

Bull Prairie Reservoir

Sampling of the trout population at Bull Prairie Reservoir revealed that stocks were in a healthy condition. Rainbow averaged 20.3 cm (8.0 inches) in length and brook trout 31 cm (12.2 inches). Average rainbow length was about 2.5 cm (1 inch) smaller than recorded in 1974 while brook trout were 3.3 cm (1.3 inches) larger.

All fish taken were in excellent condition and there appears to be a good harvestable population available for the angler. The average catch rate in 1975 was 0.4 fish per hour compared to 0.6 fish per hour in 1974.

Magone Lake

Fingerling rainbow trout are stocked into the lake as part of the management program. The average catch rate of 0.6 fish per hour and 1.2 fish per angler was down slightly from the 1974 average. Virtually no brook trout were creeled.

Olive Lake

Olive Lake is presently managed with annual releases of California rainbow trout fingerling into the lake. Lahontan cutthroat fingerlings have also been released in the past. Although Kokanee are present in the lake, few are caught. Limited creel sampling during the year revealed anglers averaged 0.6 fish per hour and 0.8 fish per angler.

Penland Lake

Virtually the entire trout population died during the 1974-75 winter. Partial winterkills have occurred in the past but none to the extent realized in the spring of 1975. Yearling trout, diverted from other scheduled waters, were planted to provide a fishery.

Fingerling trout were also stocked early in the year and the fall net inventory revealed good growth and survival of these fish.

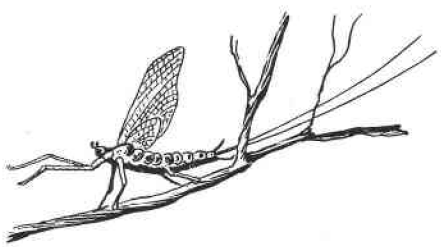
UMATILLA BASIN

Umatilla River System and Willow Creek

Anglers experienced an overall catch rate of 0.7 fish per hour and 1.4 fish per angler in the Umatilla system and Willow Creek during 1975, an increase from the 1974 average. These waters are stocked annually with hatchery trout.

Cutsforth Pond, Hatrock Pond, Tatone Pond, and Weston Pond

These waters are all stocked with yearling trout. The 1975 average catch rate of 1.0 fish per angler and 0.5 fish per hour was comparable to the 1974 catch rate.



GRANDE RONDE BASIN

Grande Ronde River, and Wallowa River

Electrofishing equipment was used during July to remove approximately 3,600 pounds of rough fish from the lower Wallowa and Grande Ronde rivers. The project involved the section of the Wallowa River from Minam to Rondowa and the Grande Ronde River from Rondowa to Wildcat Creek. The rivers were restocked with fingerling rainbow trout in August.

Whitefish angling on the Wallowa River was good during the early part of the year and an increasing number of anglers are participating in this fishery.

Snake River

The Snake River rainbow trout fishery was below average in 1975 due to the high spill from Hells Canyon Dam and the fact that gradeout summer steelhead have not been available for stocking for the past 2 years. A strong correlation exists between the success of the rainbow fishery and spill patterns. Residual gradeout steelhead have, in the past, made a significant contribution to the fishery in this area.

Hells Canyon Reservoir

The trout fishery was poor as indicated by the average catch of 0.1 fish per hour and 0.3 fish per angler.

Jubilee Lake

A heavy snowpack delayed angler access into the lake. Limited creel check data revealed an average catch of 0.6 fish per hour and 1.1 fish per angler. The lake is managed by stocking fingerling rainbow trout. Bottom food production increased from 21.3 kg (47 pounds) per acre in 1974 to 23.1 kg (51 pounds) per acre in 1975.

Morgan Lake

Anglers at Morgan Lake experienced an average catch of 0.8 fish per angler and 0.3 fish per hour. The lake is managed by making annual releases of fingerling rainbow trout.

Wallowa Lake

As in past years, a creel sampling program was conducted from May 1 through July 1 to estimate kokanee catch and angler use.

Approximately 22,000 angler hours were expended to catch 17,000 kokanee. This catch was far below the 1974 catch of 31,000 fish. The low catch was attributed primarily to poor weather conditions which resulted in reduced angler effort. Kokanee averaged 20.1 cm (7.9 inches) in length in 1975, down from the 23.4 cm (9.2 inches) noted in 1974. Kokanee have not been stocked since 1970.

The lake was stocked with 4,300 legal sized Dolly Varden in 1975. Continued annual stocking of this species should produce some large fish for future anglers.

High Lakes

Angler reports indicated a poor season, apparently due to a cold, late spring.

Catchable Trout Fisheries

Seven streams or stream sections in the Grande Ronde basin were stocked with 43,000 yearling trout, Creel sampling revealed an average catch of 1.2 fish per angler and 0.9 fish per hour.

Eight standing water bodies in the basin were stocked with 21,000 yearling trout. Creel sampling revealed an overall average catch of 2.3 fish per angler and 1.2 fish per hour.

POWDER BASIN

Burnt River

Yearling trout stocked in Burnt River early in the trout season provided an average return of 3.6 fish per angler.

High Lakes

Eight high lakes were aerially stocked in 1975 and reports from anglers during July and August indicated fair catches.

Balm Creek Reservoir

The reservoir is managed by stocking hatchery fingerling trout. Anglers experienced a catch rate of 0.5 fish per hour and 1.0 fish per angler.

Phillips Reservoir

Over 90% of the angler-caught rainbow and coho were in excess of 30.5 cm (12 inches) in length. The overall catch rate was 0.3 fish per hour and 0.7 fish per angler with boat anglers experiencing the best success.

Gill-net sampling revealed the salmonid population increased by approximately 7% from last year. Rainbow averaged 26.7 cm (10.5 inches) in length, similar to 1974. Coho increased from 22.6 cm (8.9 inches) in 1974 to 28.2 cm (11.1 inches) in 1975. The squawfish population decreased from 34% of the net inventory sample to 21% during the same period.

The reservoir is stocked annually with fingerling coho salmon and rainbow and cutthroat trout.

Pondosa Pond

The Department terminated the use agreement with the pond owner due to the high cost of needed repairs to the outlet structure and dam. The pond had been managed as a public trout fishery since 1963.

Thief Valley Reservoir

Anglers caught rainbow trout throughout the season with best catches occurring in October. However, overall success was low as they averaged only 0.5 fish per angler. The low success rate, combined with the fall net inventory which revealed only 9% of the fish population to be game fish, indicates that rough fish have increased to the point that trout production is being adversely affected.

Unity Reservoir

Unity Reservoir provided good catches of rainbow trout throughout the season for both bank and boat anglers (0.7 fish per hour and 2.1 fish per angler). The reservoir is stocked with fingerling trout.

Wolf Creek Reservoir

This new water body (maximum pool 1,225 acres; minimum pool 50 acres) was filled during the spring and rainbow trout fingerlings were stocked in late April. These fish grew well and averaged 19.8 cm (7.8 inches) in length by fall.

Catchable Trout Fisheries

Five streams or stream sections in the Powder basin were stocked with 28,000 yearling trout during 1975. Anglers averaged 1.7 fish per angler and 1.0 fish per hour from these releases.

Approximately 28,000 yearling trout were stocked into eight lakes and reservoirs in the basin and provided a return of 1.6 fish per angler and 0.8 fish per hour.

MALHEUR BASIN

Beulah Reservoir

The fall net inventory revealed a low survival of 1975 spring-released fingerlings. Since the reservoir water temperature was very warm at time of release, the fish were released into the river above the reservoir with the anticipation that they would be flushed downstream into the impoundment. This stocking method may have contributed to the poor fingerling survival. Angler success reflected the poor survival as they averaged only 0.81 fish per angler. Rough fish, primarily suckers, comprised 70% of the fall net sample even though the reservoir was chemically treated in 1973.

Malheur Reservoir

Angling pressure was light during the first half of the year but increased in the fall. Overall angler success of 1.9 fish per angler and 0.4 fish per hour was similar to the 1974 catch rate.

The fall net inventory catch was similar to 1974 in that 35% of the catch was trout. The 1975 stocking level was only one-half of the 1974 level. Growth was less than expected and reflected the increasing competition for food with rough fish.

Malheur River, North Fork

The river was stocked with yearling trout in late June and provided good angling during the July 4 holiday weekend. Good catches of large rainbow trout (40.6 to 50.8 cm; 16 to 20 inches) were also made in the river below Beulah Reservoir. The overall angler catch rate of 3.9 fish per angler and 1.0 fish per hour was excellent.

Miscellaneous Streams

Approximately 13,000 yearling trout were stocked into three stream segments in the Malheur basin. Creel sampling revealed an average return of 4.2 fish per angler and 1.0 fish per hour.

OWYHEE BASIN

Owyhee River

Electrofishing was conducted on a 16.1 km (10-mile) section of the river below Owyhee Dam and 15 species of fish, including 7 species of game fish, were collected. Cool water in this section of river allows a management program of annual releases of fingerling and yearling rainbow trout.

Limited creel sampling revealed an average catch rate of 1.7 fish per angler and 0.9 fish per hour compared to 0.9 fish per angler and 0.4 fish per hour in 1974. The catch was predominately trout although a few smallmouth bass and crappie were also taken.

Antelope Reservoir

Angling pressure was light at the reservoir, with most angling occurring in the spring and fall. Little ice fishing occurred during the winter due to mild weather. Anglers averaged 0.8 fish per angler and 0.3 fish per hour during the year.

Trout comprised 74% of the November net catch compared to only 33% in 1974. All trout showed excellent growth and averaged 27.4 cm (10.8 inches) in length.

MALHEUR LAKE BASIN

Blitzen River

River flow and angling conditions were ideal in the Blitzen River during most of 1975. Anglers fishing in remote areas of the canyon reported catching more and larger trout than in the last several years. Creel data showed an average success of 2.8 fish per angler and 1.0 fish per hour.

Emigrant Creek

A portion of Emigrant Creek was stocked with 3,000 yearling hatchery trout and provided a return of 3.9 fish per angler and 0.9 fish per hour.

Chickahominy Reservoir

Water storage was poor at Chickahominy Reservoir for the third straight year. Angling pressure was comparable to 1974 when an estimated 6,000 angler days were spent at the reservoir. The catch rate was good as anglers averaged 2.5 fish per angler and 0.6 fish per hour.

The fall gill-net inventory catch was similar to last year in both numbers and size of fish recovered. Trout averaged 23.9 cm (9.4 inches) in length.

Delintment Lake

The lake experienced a complete winterkill in 1974 and a partial kill occurred in 1975. Approximately 6,000 yearling trout were stocked into the reservoir early in the year and these fish provided an excellent fishery throughout the year. Angler success was 3.8 fish per angler and 0.6 fish per hour.

Krumbo Reservoir

Legal sized rainbow trout liberated into the reservoir by the USFW Service were prevalent in the creel. Angler success of 0.8 fish per angler and 0.3 fish per hour was below that experienced in 1974.

The spring gill-net inventory revealed roach had increased in number to 92% of the fish population compared to only 32% in 1974. The rapid increase in the roach population probably contributed to the reduced angler success.

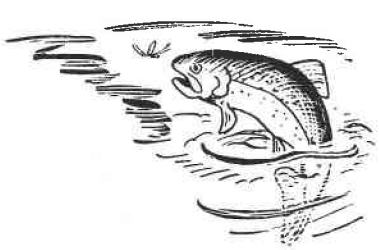
Mann Lake

Angler use increased in 1975 with an estimated 3,000 angler trips expended on the lake. The lake was heavily used during the late winter and spring. The average catch rate was 2.1 fish per angler and 0.6 fish per hour.

Lahontan cutthroat trout eggs were collected from spawning trout and used for statewide production.

Miscellaneous

Two standing water bodies in the basin, Fish Lake and Burns Gravel Pond, were stocked with yearling hatchery trout. Approximately 12,000 fish were released into these waters and provided an average catch of 1.1 fish per angler trip.



GOOSE AND SUMMER LAKE BASIN

Thompson Reservoir

Thompson Reservoir is stocked with California rainbow trout. This race of rainbow, even when quite small, has exhibited a tendency to feed heavily on roach. Roach are abundant in the reservoir and several chemical rehabilitation attempts have failed to remove these fish.

Management programs under way or anticipated are as follows:

1. Two releases of marked fish are being monitored for growth.
2. Stomach contents of fish are being examined to verify feeding habits.
3. A statistical creel sampling program is scheduled for 1976 to provide angler use and catch estimates.

Limited creel sampling conducted during 1975 revealed an average angler catch of 0.2 fish per hour and 1.3 fish per angler.

WARM-WATER GAME FISH

Angler demand for warm-water game fish continues to increase. In 1975, warm-water species provided nearly 500,000 angler-days of recreation, or over 9% of the total angler use.

NORTH COAST BASIN

Cullaby Lake

The population inventory indicated a significant increase in the yellow perch population and a decrease in the brown bullhead population. The number of other species remained relatively unchanged.

Approximately 2,800 largemouth bass fingerlings, averaging 8.4 cm (3.3 inches) fork length, were stocked into the lake in early December. These fish will supplement the existing bass population in view of the increasing number of perch.

MID-COAST BASIN

Devils Lake

Gill-net sampling in Devils Lake took four species of warm-water game fish: brown bullhead, yellow perch, black crappie, and largemouth bass. No white crappie were captured this year and fewer black crappie were recovered. Brown bullheads, averaging

28.7 cm (11.3 inches) fork length, comprised 26% of the total catch.

Siltcoos Lake

Largemouth bass catch information for the period February through April showed an average catch rate of 0.6 fish per angler which was below the 1967-74 average of about 1.0 fish per angler.

Gill-net sampling in August captured more suckers than in any prior year and more squawfish than in any previous year except 1962.

WILLAMETTE BASIN

Wilsonville Pond

Fingerling largemouth bass were stocked into the pond in 1974. These fish have shown good growth with some maturing and spawning in 1975. The pond was seined in September and many bass fingerlings, averaging 4.1 cm (1.6 inches) fork length, were recovered.

Barnick Pond

An initial stocking of largemouth bass fry, channel catfish, and black crappie was made to establish a fishery. In order to maintain the water level at a depth of 6.1 m (20 ft), periodic pumping from the well will be required.

Bond Butte Pond

Fingerling channel catfish were recovered while seining and indicate that natural reproduction has occurred. A new fish species, fathead minnow, was also collected from the pond. The fathead minnow was not known to be present in the Willamette River drainage and their origin is unknown.

UMPQUA BASIN

Cooper Creek Reservoir

Bluegill were observed for the first time in population samples. No creel sampling was done in 1975.

SOUTH COAST BASIN

Tenmile Lakes

These lakes provided the major warm-water fishery in the area. The intensity of the largemouth bass fishery increased rapidly due to increased pressure from local and out-of-area anglers and, in particular, organized bass clubs.

Largemouth bass growth and reproduction has been excellent in the past. However, in 1975 the number of juvenile bass observed was considerably less than in 1974 and may indicate that some problems in reproduction are occurring.

Bluegill continue to dominate the population and show no sign of stunting. The Lakeside-sponsored bluegill derby, designed to encourage removal of this species from the lake by angling, succeeded in removing over 5,000 bluegill in one day.

ROGUE BASIN

Selmac Lake

A spring die-off of bluegill, crappie, and bullheads again occurred in the lake. Gill-net sampling in June indicated poor populations of warm-water game fish were present. The catch was composed of largemouth bass (0.2%), black crappie (6.3%), bluegill sunfish (5.0%), brown bullhead (9.7%), and rainbow trout (78.8%).

DESCHUTES BASIN

Hansen Pond

Thirty-seven largemouth bass were recovered from Hansen Pond by seining. Ten of the fish had been marked in 1974 and had increased from an average length of 15.2 cm (6.0 inches) to 18.8 cm (7.4 inches). Two other marked bass of a larger size class grew from an average length of 24.1 cm (9.5 inches) to 26.1 cm (10.1 inches). Larger age classes of bass were absent from the catch. Growth data indicate that the pond, less than one-half acre in size, is probably overstocked.

Prineville Reservoir

Interest in bass angling continued to increase at the reservoir as three angling tournaments were held by Oregon bass clubs. More tournaments are scheduled for the future. The largest bass caught in the reservoir in 1975 were a 3.3 kg (7 lb. 6 oz) largemouth bass and 2.2 kg (4 lb. 15 oz) smallmouth bass.

KLAMATH BASIN

Gerber Reservoir

Trap-net population sampling at Gerber Reservoir recovered brown bullhead (59.1%), white crappie (24.0%), yellow perch (10.7%), black crappie (3.5%), pumpkinseed (1.5%), and rainbow, coho, and suckers (each 0.4%). In 1974 white crappie comprised 76% of the catch with most fish in the 10.2 and 12.7 cm (4- and 5-inch) size group. These small fish were absent from the 1975 population sample.

JOHN DAY BASIN

John Day River

Reports of anglers catching channel catfish from the John Day River below Kimberly were confirmed and indicate earlier fingerling plants were successful in establishing a catfish population in the river.

Smallmouth bass were introduced into the river at Service Creek 5 years ago and they are continuing to extend their distribution in the drainage. Bass are now found from Dayville to Rock Creek, a distance of 307.5 km (191 miles). Smallmouth bass have also extended their distribution up the North Fork John Day River for a distance of 32.3 km (20 miles).

McKay Reservoir

Angling was extremely poor at the reservoir and consequently angler effort was low. The poor fishery is due to the extreme drawdown of the reservoir in the fall of 1973 which forced a number of different year-classes of fish to leave the reservoir. In 1975 good numbers of crappie were available to the angler but they were small and averaged less than 22.9 cm (9 inches) in length.

Umatilla River

Two hundred and eight smallmouth bass were stocked into the Umatilla River in an attempt to establish a bass population downstream below the City of Pendleton.

POWDER BASIN

Powder and Burnt Rivers

Ninety smallmouth bass were released into the Powder River near Haines and 92 bass were released into the Burnt River near Durkee in an attempt to establish a smallmouth bass fishery.

MALHEUR BASIN

Bully Creek Reservoir

Bass and crappie have been stocked into the reservoir but trout still comprised the bulk of the angler catch. By fall the body condition of trout had declined noticeably indicating an increased competition for food from both warm-water game fish and rough fish.

Two gill nets and a trap net were fished during the fall to inventory the fish populations. Adult white crappie had successfully spawned as 92% of the trap-net catch was this year's fry. Although no largemouth bass fry were recovered, they were observed swimming in the shallows during the summer and indicated successful spawning.

OWYHEE BASIN

Owyhee Reservoir

Angler success improved from the 2.7 fish per angler and 0.6 fish per hour recorded in 1974 to 5.7 fish per angler and 1.5 fish per hour in 1975. An increase in the crappie population was primarily responsible for the improved catch.

Population sampling indicated an increase in crappie recruitment, a noticeable decrease in the number of large channel catfish, and a high percentage of yellow perch in the 7.6 to 10.2 cm (3- to 4-inch) size range. All species of fish exhibited poor body condition as a result of a cool spring, turbid water conditions, and extended high flows which adversely affected food production. Carry-over storage in Owyhee Reservoir was the highest since the dam was constructed in 1932.

Owyhee River

Channel catfish have become well established in the Owyhee river below Rome. Increased angler success was also noted for smallmouth bass in the farming area around Rome.

MAIN STEM COLUMBIA RIVER

Angling for warm-water species improved considerably over 1974 with the improved catch rates being attributed primarily to low river levels during the spring and summer months.

A trap net was used to sample warm-water fish populations in Rooster Rock Slough. Ninety-five percent more fish were recovered using the trap net than had been previously recovered with

gill nets. The increased catch indicates the trap net is more efficient in sampling warm-water fish populations. Site selection for setting the net is also an important factor. Black crappie comprised 78% of the catch and white crappie 22%.

Walleye have extended their distribution in the Columbia River. They are now well established below John Day Dam and have also been picked up in the Willow Creek area and in the John Day pool. A minor Walleye fishery has developed below the town of Rufus.

MARINE FISH

Marine fish include all marine and estuarine fish and shellfish. These saltwater/bay animals are also known as nongame marine food fish. Most of the groundfish, ocean pink shrimp, and ocean stocks of Dungeness crab are utilized only by the commercial fisheries as they occur too deep to be harvested by the recreational fishermen. Species harvested almost entirely by the recreational fisheries include some of the bay or inshore groundfishes (perch, greenling, cabezon), abalone, bay clams, razor clams, crawfish, and mud shrimp. Some support both commercial and sport fisheries (lingcod, some species of rockfish, Dungeness crab, albacore tuna, starry flounder, and baitfish).

In 1975, Oregon's marine fisheries were worth over 15 million dollars to commercial fishermen in the albacore, crab, groundfish, and shrimp fisheries. The value of a growing recreational fishery along the ocean beaches, jetties, bays, and near offshore areas is unknown but probably substantial.

An angling license is not required for recreational users of these resources. About the only restrictions on recreational users are bag limits and special restrictions on some popular intertidal invertebrates along the open coast. Commercial fishermen are required to purchase a commercial fishing license. Restrictions include seasonal closures on the Dungeness crab and shrimp fisheries and gear limitations on groundfish trawlers.

ALBACORE TUNA

Albacore tuna are highly migratory and found in all temperate oceans of the world. Albacore caught off the Oregon coast belong to the North Pacific stock which is separate from other stocks in the world.

Status of the Stocks: In recent years the total annual harvest of North Pacific albacore has risen to about 100,000 t (metric tons). The catch has increased primarily due to the expansion of the Japanese pole-and-line fishery which, in 1974, landed about 64% of the total catch. The other major fisheries are the Japanese longline fishery (15% of catch) and the United States troll and live-bait fisheries (21%).

Cooperative analysis of the U.S. and Japanese landing data was presented at the "Workshop on the Population Dynamics of North Pacific Albacore" held in Honolulu, Hawaii, in December 1975. The maximum sustainable annual yield for North Pacific albacore was tentatively judged to be about 115,000 to 125,000 t. Thus,

the present annual catch is less than, but approaching, the average biological limits of the stock.

Recreational Fishery: During the last 10 years the bulk of the albacore catch on the U.S. West Coast has been centered off the Pacific Northwest. During this period, charter boat fleets have increased in both number and size of vessels. The use of larger boats now make it possible to take a relatively large party of anglers from 64 to 161 km (40 to 100 miles) offshore to reach areas where albacore are found. Although an accurate estimate of the recreational catch is not available, the annual harvest off Oregon is about 3,000 to 5,000 fish. The fishery has grown significantly in recent years and will continue to grow as sportsmen learn of the sporting qualities of albacore.

Commercial Fishery: The first commercial landings of albacore in Oregon occurred in 1936. Annual landings have ranged from a low of 12.5 t (27,600 lb.) in 1936 to a high of 17,121 t (37,751,816 lb.) in 1968 (Table 26). The 1975 landings totaled 7,784.8 t (17,165,537 lb.) about 394.6 t (870,000 lb.) less than the past 5-year average.

BAITFISH

The principal baitfish species taken in Oregon are the Pacific herring and northern anchovy.

Status of the Stocks: No estimate of the stock size of either herring or anchovy is available. The existing bait fisheries have been allowed to develop and continue without stock size data because landings have been small and the resource seems to be unharmed by the current level of fishing activity.

Recreational Fishery: Recreational fisheries for herring normally occur in several estuaries including Tillamook, Yaquina, Siuslaw, and Umpqua. The Tillamook Bay fishery generally occurs during the month of February while the other estuaries support fisheries during the summer months. In 1975, a sport fishery occurred in all estuaries except Tillamook Bay, where the normal run of fish did not appear.

The recreational fishery for northern anchovy is confined to the Chetco estuary as large numbers of anchovy do not normally enter other estuaries.

Commercial Fishery: During the 10-year period 1966-75, Oregon's commercial landings of herring ranged from 12.4 to 42.5 t (27,285 to 93,646 lb.) and averaged 25.4 t (56,000 lb.). All commercial fishing occurs inside estuaries. For the past several years the Tillamook, Yaquina, and Umpqua estuaries have provided nearly all of Oregon's landings with the Umpqua accounting for over 50%

Table 26. Oregon albacore tuna landings, in pounds, by month of landing, 1936-75.

Year	July	August	September	October	November	December	Total
1936							27,600
1937	-	65,818	944,137	288,077	49,154	6,336	1,353,522
1938	-	-	-	-	-	-	8,000,000
1939	6,346	2,835,941	2,912,702	729,806	-	-	6,484,795
1940	2,589,505	5,232,822	1,319,707	144,227	-	-	9,286,261
1941	778,890	5,652,549	1,063,971	44,437	5,284	-	7,545,131
1942	2,061,574	5,047,732	2,876,280	957,370	-	-	10,942,956
1943	1,752,612	4,083,183	3,446,139	1,214,022	-	-	10,495,956
1944	1,587,917	8,978,984	8,778,448	3,142,838	3,838	-	22,492,025
1945	1,454,131	7,902,500	2,589,762	231,978	-	-	12,178,371
1946	393,890	2,371,039	1,185,875	-	-	-	3,950,804
1947	1,028,515	2,650,556	4,815,158	1,063,433	-	-	9,557,662
1948	2,620,140	3,707,332	1,372,126	175,372	129,357	-	8,004,327
1949	631,604	2,180,496	2,188,800	1,425,920	30,337	225	6,457,382
1950	1,534,713	1,902,085	495,972	1,242,483	210,851	-	5,386,104
1951	41,183	216,786	1,302,648	1,254,324	101,604	-	2,916,545
1952	13,994	123,099	1,299,165	840,039	256,469	52,591	2,585,357
1953	-	21,378	566,188	187,201	1,000	-	775,767
1954	-	-	98,952	360,251	10,237	-	469,440
1955	-	-	26,881	318,211	158,212	-	503,304
1956	-	447,482	2,615,237	424,692	156,962	8,727	3,653,100
1957	82,659	896,063	626,374	1,064,218	32,193	-	2,701,507
1958	393,361	5,372,518	3,042,537	944,507	1,066	-	9,753,989
1959	1,444,097	4,081,597	4,362,101	573,578	111,597	1,060	10,574,030
1960	19,126	899,974	2,605,238	932,842	105,415	-	4,562,595
1961	23,050	1,188,391	1,496,130	538,566	3,626	-	3,249,763
1962	28,101	4,662,613	2,727,483	1,414,345	103,577	13,369	8,949,488
1963	76,097	5,445,516	3,990,480	1,835,435	44,917	7,084	11,399,529
1964	39,155	1,066,575	2,096,195	1,229,179	20,896	-	4,452,000
1965	5,641	3,059,139	6,550,461	2,261,195	243,805	2,193	12,122,434
1966	635,276	11,362,964	3,375,579	2,630,157	36,638	-	18,040,614
1967	432,402	15,296,637	10,465,139	3,045,594	2,924	-	29,242,696
1968	8,082,701	18,018,089	8,649,553	2,986,855	13,921	697	37,751,816
1969 1/	2,913,115	18,265,216	6,906,048	1,525,507	151,120	66,049	29,827,549
1970	7,589,773	7,169,072	5,749,076	961,575	296,257	15,821	21,781,574
1971	2,799,145	4,886,922	165,325	530,390	37,803	-	8,419,585
1972	4,815,644	13,633,518	4,463,855	122,481	20,506	-	23,056,004
1973 2/	96,179	10,083,885	5,500,339	656,225	4,456	-	16,349,895
1974	2,759,245	12,433,103	8,881,669	1,126,150	24,553	-	25,224,720
1975	1,325,988	12,256,369	2,745,129	761,515	76,536	-	17,165,537

1/ June - 494 lb.
2/ June - 8,811 lb.

of the total. However, the 1975 catch of 32.0 t (70,621 lb.) was taken entirely from the Umpqua and Yaquina estuaries since herring failed to enter Tillamook Bay in large numbers.

Complete commercial landing records for anchovy are available only from 1969 to present. During this period, landings ranged from 1.2 to 17.7 t (2,600 to 39,127 lb.) and averaged 6.3 t (13,800 lb.). The only dependable anchovy fishery occurs in the Chetco estuary; however, in 1975, Yaquina Bay contributed 30% of the state's total landings of 17.7 t (39,127 lb.).

GROUNDFISH

Status of the Stocks: Flatfish stocks are in healthy condition. Recent analysis, based on 1971-74 (Oregon) and 1975 (Washington) biomass surveys, indicates the exploitation rate is between 7% and 10% annually. Of the seven species of flounder landed by the trawl fleet only the petrale sole appears to be fully exploited.

Status of the various rockfish stocks, in general, is fair except for Pacific ocean perch stocks which are in critical condition. This species was the subject of an intense foreign fishery in 1966-67 and it was estimated that marketable biomass of ocean perch off the Oregon-Washington coasts was reduced by 85% during the period. Perch stocks have still not recovered from this overfishing although there are indications that an above-average 1970 year class is entering the fishery.

Recreational Fishery: Recreational fisheries use a number of Oregon's marine food fish. Except for data collected during a 1971 estuarine use survey, little is known about these fisheries except that they are growing in importance. Geographically the sport fishery can be divided into three areas: estuarine, open coast, and offshore.

> The principal recreational species harvested in each of these areas are:
>
> Estuarine - surfperch (striped, redtail, pile), starry flounder, kelp greenling, Pacific herring, rockfish, lingcod, cabezon, and northern anchovy.
> Open coast - surfperch (primarily redtail), kelp greenling, rockfish, cabezon, lingcod, and Pacific tomcod.
> Offshore - rockfish (yelloweye, canary, black), lingcod, and kelp greenling.

Stock status of these species is believed to be healthy with possible highly localized (and probably temporary) depletion of rockfish and/or lingcod in some heavily used reef areas. Increasing use of these species and fishing areas could necessitate more stringent regulations in the future.

The recreational fishery is important to both personal use (e.g., fishermen not using charter services) and the charter boat industry along Oregon's coast. Charter boats mainly fish for these resources in winter or slack time summer-fall periods when salmon are not available. The use of nonsalmon resources is becoming increasingly important.

Commercial Fishery: The Oregon groundfish trawl fleet (74 vessels in 1975) landed 8,798.1 t (19.4 million lb.) of fish during the year (Table 27). The 1975 catch was slightly below the 1974 catch and 13% less than the 10-year average.

Catch-per-unit effort, at 0.3 t (679 lb.) per hour, dropped to the lowest level in the past 10 years. The decline in catch rate may be partially attributed to the rather severe market limits, especially on flatfish, that prevailed during most of the 1975 fishery. This resulted in a reduction of effort in areas where certain species of flatfish are found in high abundance in favor of short trips to areas where a variety of fish species are found in order to fill trip limits imposed on fishermen by buyers.

Groundfish landings by five other fisheries totaled over 453.5 t (1 million lb.) (Table 28). The shrimp trawl and the troll salmon fisheries accounted for nearly 90% of this total with rockfish being the major species group landed. The pot fishery is a specialized fishery most effective for catching sablefish; however, a small number of lingcod and rockfish are also taken.

ABALONE

Status of the Stocks: Four species of abalone (the red, black, flat, and pinto) have been reported from Oregon. Only the flat and red abalone are found with any frequency and only the red abalone attains the 8-inch minimum size limit required for recreational harvest. It is unlawful to take abalone for commercial purposes.

The exact status of red abalone stocks is unknown but various surveys have determined the Curry County coast to be the focus of red abalone in Oregon. The Sunset Bay area near Coos Bay is the northernmost point where natural populations of red abalone have been noted. In 1967 an experimental plant of red abalone was made in Whale Cove on the central coast. Subsequent checks indicate that the species will survive and grow north of its range but there is no evidence of spawning occurring. Mark-recovery data collected in 1975 indicated that 241 (4.4%) of the original 5,500 juveniles planted still survived. The planted abalone were growing at a comparable rate to abalone found in California.

Table 27. Landings (in thousands of pounds) and effort (in hours) of the Oregon trawl fishery, 1965-75.

Species	Year										
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
English sole	1,678	3,537	2,304	2,360	1,716	1,884	1,799	2,196	2,371	1,747	2,166
Rock sole	4	18	8	51	25	5	122	2	tr.	4	31
Petrale sole	1,838	1,838	1,771	1,653	1,835	2,141	2,284	2,185	2,191	2,692	2,649
Dover sole	3,631	3,492	3,565	4,325	5,553	5,538	5,538	5,942	4,416	5,604	4,780
Rex sole	985	1,498	1,219	1,075	1,215	1,074	839	1,314	1,256	1,300	1,024
Starry flounder	410	477	277	454	251	426	485	439	339	408	820
Other flatfish	62	205	245	215	506	646	521	600	657	581	1,014
Pacific cod	194	628	430	385	47	78	483	1,069	453	685	584
Lingcod	852	993	1,067	1,526	1,084	945	1,281	1,349	1,999	1,937	1,534
Sablefish	130	68	67	56	135	111	240	403	838	547	672
Pacific ocean perch	13,647	4,518	1,706	1,649	940	1,595	1,649	602	540	831	960
Other rockfish	4,121	5,069	4,061	4,253	5,101	3,515	3,404	4,057	3,558	2,545	2,498
Misc. species	23	12	8	31	4	17	28	36	63	59	36
Dogfish	1	0	0	2	tr.	17	4	tr.	tr.	12	4
Animal food 1/	4,152	3,357	3,999	2,815	2,599	2,052	1,786	730	603	708	580
Reduction use	1,498	79	18	49	45	0	0	0	0	0	0
Total	33,226	25,789	20,745	20,899	21,057	20,044	20,463	20,924	19,284	19,660	19,352
Total hours	29,254	23,676	20,183	24,456	25,692	27,587	28,644	29,206	28,243	27,258	28,468
Pounds/hour	1,136	1,089	1,028	855	818	727	714	716	683	721	679
Ocean Shrimp	1,751	4,751	10,373	10,977	10,505	13,734	9,291	20,581	24,517	19,968	23,893

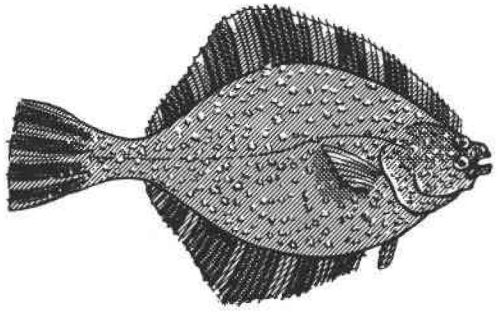
1/ Scrap species used primarily by the mink food industry; increasing use since 1973 by salmon mariculturists.

tr. = trace or less than 500 lb.

Table 28. Groundfish landings (in thousands of pounds) by other ocean fisheries in Oregon, 1975.

Species	Fishery				
	Shrimp Trawl	Troll Salmon	Pot	Jig	Longline
English Sole	2		1		
Rock Sole			tr.		
Petrale Sole	11	tr.			
Dover Sole	38				
Rex Sole	1				
Starry Flounder		tr.	tr.		
Other Flatfish	2	tr.	tr.		
Pacific True Cod	4				
Lingcod	45	45	16	1	tr.
Sablefish	29		108		
Pacific Ocean Perch	31				
Other Rockfish	393	300	4		2
Misc. Species			1		
Total Landings	556	345	130	1	2

tr. = trace or less than 500 lb.



Recreational Fishery: Abalone are taken by Scuba divers and a few shore pickers. To obtain information on recreational interest in abalone, the Department initiated a permit system in 1973 where all persons wishing to take abalone must report their trips and success to the Department. Table 29 summarizes these reports for 1973 through 1975. Results for 1975 are preliminary but indicate a greatly reduced catch.

Table 29. Summary of abalone permits issued in Oregon, 1973-75.

	1973	1974	1975
Number of permits issued	108	100	99
Number of usable permits returned	96	79	63
Number of permits used	21	28	17
Number of trips	65 1/	57 1/	94 1/
Number of abalone taken	55 2/	50	5
Abalone per trip	0.8	0.8	0.05

1/ Trip data are probably underestimated as some pickers only listed their successful trips. In 1975 one permit holder listed 45 trips while the other pickers reported a mean of 3 trips per person.

2/ One permit holder reported taking a total of 18 abalone while the other pickers reported a mean of 1.8 abalone per person.

BAY CLAMS

Status of the Stocks: Stocks of bay clams in each Oregon estuary appear to be in a healthy condition although some popular tide-flat areas are experiencing some problems. Littleneck clams from Garibaldi flat in Tillamook Bay showed a reduced average size from previous years and there was a noticeable change in species taken from the area. The number of large gaper clams taken from the Happy Camp flat in Netarts Bay has been greatly reduced and small clams are now entering the fishery in greater

numbers. Cockle clams are also being taken at a reduced size from several areas.

Intertidal and subtidal clam distribution surveys have been completed in Siletz, Yaquina, and Alsea bays. Surveys are currently being conducted on Nehalem, Tillamook, Netarts, Nestucca, Salmon, Siuslaw, and Coos bays. Population estimates of subtidal clam populations in Tillamook, Yaquina, and Coos bays in 1974-75 were 20.7, 148.5, and 26.4 million clams, respectively.

The 1975 year class of gaper clams in Yaquina and Coos bays was very abundant, reflecting good set-survival. In Tillamook Bay, gaper clams of the 1970 and 1971 year classes were dominant, while cockle and littleneck clams exhibited strong 1969 through 1973 year classes.

Recreational Fishery: Five species of bay clams are utilized by recreational diggers. These are the cockle, softshell, gaper, native littleneck, and butter clams in order of importance. One or more of these species are harvested in sizable numbers from Tillamook, Netarts, Nestucca, Yaquina, Alsea, Siuslaw, Umpqua, and Coos estuaries. Other estuaries are utilized to a lesser degree.

An estuary use study conducted in 1971 provides the only comprehensive information on the recreational use of bay clams, except for a few isolated studies. The 1971 estuary use survey showed an estimated 1.8 million bay clams were taken in 103,000 digger-trips that year. There appears to be a general trend toward an increasing number of diggers.

Commercial Fishery: The commercial harvest of bay clams ranged from 7.2 t (16,000 lb.) to 139 t (306,000 lb.) between 1941 and 1975 (Table 30). Only 7.2 t to 28 t (62,000 lb.) have been taken annually since 1965.

The increased harvest in 1972 and 1975 reflects the subtidal harvest by one operator in one area and indicates a fishery on subtidal clam stocks has great potential. Subtidal clam stocks in Tillamook, Yaquina, and Coos bays have the greatest potential for harvest with gaper clams being the target species.

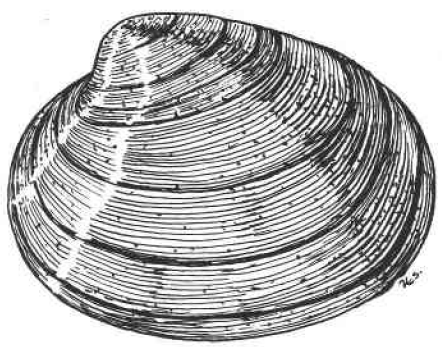


Table 30. Commercial bay clam landings in Oregon from 1941-75.

Year	Pounds (1,000's)	Year	Pounds (1,000's)
1941	214	1959	65
1942	121	1960	76
1943	178	1961	68
1944	204	1962	109
1945	306	1963	71
1946	265	1964	61
1947	178	1965	48
1948	122	1966	40
1949	135	1967	28
1950	149	1968	28
1951	155	1969	21
1952	149	1970	26
1953	135	1971	29
1954	134	1972	62
1955	113	1973	17
1956	124	1974	16
1957	96	1975	27
1958	77		

RAZOR CLAMS

Status of the Stocks: Razor clams are found intermittently along the entire Oregon coast. However, approximately 90% of the annual Oregon harvest is taken from the 29 km (18-mile) long Clatsop beach which extends from the Columbia River south to Tillamook Head near Seaside. Beaches south of Seaside tend to be sporadic in razor clam production.

Razor clam production has shown marked fluctuations and generally reflects the relative abundance and survival of individual age groups. Most clams in the population are less than 2 years of age and in years of poor set or survival of small clams the resource abundance can be substantially affected the following year or two.

The subtidal razor clam population exists beyond the beaches to about the minus 6.1 m (20 ft) water depth. Spawning by the subtidal portion of the stocks probably provides much of the set for the intertidal beaches.

Recreational Fishery: The number of recreational digger days and the razor clam harvest from 1955 to 1975 is shown in Table 31. The recreational harvest totaled an estimated 900,000 clams taken in 75,000 digger-trips in 1975. The harvest level fluctuates and is usually proportional to the clam population size. However, the general state of the economy may also affect the

Table 31. Recreational and commercial harvest of razor clams from Clatsop beaches and number of digger days expended, 1941-75.

Year	Harvest (Millions)			Effort (Thousands)		
	Rec.	Comm.	Total	Rec. Trips	Comm. Trips	Total
1941	-	0.5	0.5	-	-	-
1942	-	0.05	0.05	-	-	-
1943	-	0.06	0.06	-	-	-
1944	-	0.2	0.2	-	-	-
1945	-	0.3	0.3	-	-	-
1946	-	0.6	0.6	-	-	-
1947	-	0.7	0.7	-	2.7	2.7
1948	-	0.8	0.8	-	6.8	6.8
1949	-	0.8	0.8	-	6.7	6.7
1950	-	1.3	1.3	-	12.4	12.4
1951	-	1.5	1.5	-	8.3	8.3
1952	-	1.9	1.9	-	11.1	11.1
1953	-	1.3	1.3	-	8.5	8.5
1954	-	0.8	0.8	-	7.6	7.6
1955	1.5	0.9	2.4	49.0	5.5	54.5
1956	1.4	0.5	1.9	52.0	3.2	55.2
1957	2.1	0.3	2.4	77.0	2.5	79.5
1958	1.9	0.4	2.3	86.0	2.8	88.8
1959	0.8	0.2	1.0	54.0	1.5	55.5
1960	0.6	0.2	0.8	49.0	1.3	50.3
1961	0.7	0.08	0.78	51.0	0.7	51.7
1962	1.0	0.1	1.1	52.0	0.9	52.9
1963	0.8	0.1	0.9	56.0	0.9	56.9
1964	1.4	0.1	1.5	70.0	1.2	71.2
1965	1.3	0.4	1.7	76.0	2.3	78.3
1966	1.5	0.3	1.8	78.0	2.2	80.2
1967	1.7	0.5	2.2	74.0	4.1	78.1
1968	1.0	0.4	1.4	64.0	3.1	67.1
1969	1.0	0.1	1.1	59.0	1.0	60.0
1970	0.8	0.06	0.86	56.0	0.6	56.6
1971	1.2	0.1	1.3	78.0	1.5	79.5
1972	0.8	0.05	0.85	69.0	0.7	69.7
1973	0.9	0.09	0.99	76.0	0.7	76.7
1974	0.4	0.03	0.43	44.0	0.5	44.5
1975	0.9	0.2	1.1	75.0	1.5	76.5

fishery as, for example, when the energy crisis in 1974 limited travel and greatly reduced the number of diggers.

A major problem occurring in the recreational fishery is clam wastage. Previous studies conducted by the Department have shown that up to 20% of the clams dug are willfully discarded because they are too small or broken. Consequently, current regulations require all clams to be retained, regardless of size or condition. In order to obtain additional growth from small clams and to reduce wastage, a 6-week (July 16 to August 31) digging closure was initiated on Clatsop beaches in 1967. The closure appeared to ease the problem; however, an increase in the number of diggers has caused the problem to reoccur.

Commercial Fishery: The commercial harvest of razor clams and the number of digger days from 1941 to 1975 is shown in Table 31. The commercial harvest totaled 200,000 clams, taken in 1,500 digger-trips during 1975. The fishery has generally declined since 1952 to a low level of production. Competition with recreational diggers and fewer commercial diggers are the major causes for the decline. A 4-1/4 inch minimum size limit imposed in 1954 also helped to suppress the harvest. The present 3-3/4 inch minimum size limit, initiated in October 1972, has had little, if any, impact on the resource and no measurable impact on the harvest level.

CRABS

Status of the Stocks: Status of the crab stocks is best shown by examining the commercial fishery on Dungeness crab, the best measure available. Pacific Coast biologists believe that up to 90% of the available legal crabs are harvested annually and the yearly harvest effectively reflects the actual population size of legal male crabs. A single age group dominates annual catches.

The crab population, coast-wide, fluctuates widely and is believed to do so in response to natural fluctuations in survival of larvae and/or juveniles long before they are available to fishing. Two hypotheses offered for the fluctuations are coastal upwelling phenomena resulting in offshore transport of larvae and coastal rainfall affecting (presumably) salinity and primary productivity in the nearshore ocean where crabs are normally found.

Recreational Fishery: Recreational crabbing is a popular pastime and occurs in almost all of Oregon's estuaries. The 1971 recreational use survey data indicated that about 200,000 crabs were taken by recreational users during the survey period. Coos, Yaquina, Tillamook, Netarts, and Alsea estuaries experienced the highest recreational use. Although Dungeness are the primary crab species sought, a small number of the related red rock crab are also taken. It appears that the number of recreational crabbers will continue to increase. A very limited recreational fishery exists in the open ocean.

Commercial Fishery: Regulations governing minimum size (6-1/4 inches), sex (males only), and season (December 1 to August 15) effectively prevent overharvest of the crab population. The season closure is designed to prevent or minimize handling mortality of soft-shelled crabs. Because at least one age group of males and all females are allowed to mate and spawn prior to harvest, adequate recruitment is believed to occur each year.

The 1975 crab harvest was one of the lowest on record (1,496.6 t; 3.3 million lb.), continuing a low-harvest era starting in 1973 (Table 32).

Table 32. Oregon Dungeness crab commercial landings, 1951-75.

Year	Pounds (Millions)	Year	Pounds (Millions)
1951	7.5	1964	3.6
1952	5.4	1965	6.4
1953	6.4	1966	8.7
1954	10.1	1967	9.6
1955	6.4	1968	10.2
1956	8.9	1969	12.0
1957	11.7	1970	14.0
1958	10.1	1971	15.0
1959	7.1	1972	6.9
1960	8.3	1973	3.1
1961	11.4	1974	3.5
1962	5.7	1975	3.3
1963	3.6		

Most of the catch (93%) was taken during the period December to July 1. The July through August harvest totaled only 5% of the total catch while the September through November harvest, all taken in estuaries, was only 2.8% of the harvest. The estuary fishery normally amounts to less than 10% of the total harvest. Many crab fishermen ceased fishing by the end of March due to poor catches and their conversion to the shrimp fishery.

SHRIMP

Status of the Stocks: Shrimp stocks are assessed by an annual survey cruise and routine sampling of commercial landings during the season. The 1975 shrimp survey was conducted in the spring and only the Coos Bay area (Siuslaw River to Coos Bay) was surveyed. Midpoint biomass estimates for the 1975 spring survey and prior surveys are:

Year	Area Coos Bay	95% C.I.	Area Northern Oregon	95% C.I.
1971 (Fall)	9,029,000 lb	±45%	12,877,000 lb	±46%
1972 (Fall)	13,184,000 lb	±50%	13,027,000 lb	±46%
1973 (Fall)	13,426,000 lb	±28%	13,272,000 lb	±30%
1974 (Spring)	18,467,000 lb	±42%	-	
1974 (Fall)	11,813,000 lb	±43%	13,981,000 lb	±40%
1975 (Spring)	16,789,000 lb	±63%		

The larger estimate for Coos Bay in the spring of 1974 and 1975 compared with surveys made 6 months earlier in the fall of 1973 and 1974, respectively, reflects the recruitment of age 1 shrimp to the sampling gear. Despite the decrease in biomass estimates between the spring surveys off Coos Bay the shrimp stock status remained in a healthy condition.

Although no survey was made of the northern Oregon stocks it appears from commercial landing data that their status continued to be stable. Sampling of commercial landings at northern Oregon ports indicated an even distribution among the three major age groups until midseason when age 1 shrimp composed a major portion of the shrimp caught. Sampling of commercial landings at Coos Bay showed a strong incoming year class that dominated the landings during the course of the season.

Commercial Fishery: Shrimp landings for 1975 totaled 10,839 t (23.9 million lb.), the second highest season total in the history of the fishery (Table 27). Price negotiations at the start of the season kept the majority of the fleet in port for 1-1/2 months. Despite the poor start, good catches in May and excellent catches in July and September resulted in a near-record season. The July catch of 2,630.4 t (5.8 million lb.) was a 1-month record and was nearly surpassed by a surprising 2,494.3 t (5.5 million lb.) landed in September.

The major producing areas were off Coos Bay (4,716.6 t; 10.4 million lb.) and off north-central Oregon (3,492.1 t; 7.7 million lb.). The combined landings from both areas exceeded the 1974 landings for these areas by 3,220 t (7.1 million lb.). The catch by Oregon vessels off the Washington coast totaled 1,904.8 t (1.9 million lb.) in 1975. Only 0.9 t (1,900 lb.) of shrimp reportedly caught off British Columbia and 0.3 t (585 lb.) caught off California were landed in Oregon.

MISCELLANEOUS ANIMALS

Crawfish

Crawfish are found in nearly every stream, lake, and river in the state; however, no population assessments have been

made. The few studies that have been made dealt with the animals directly and not their use. An inquiry was sent to all district biologists in 1974 requesting information on crawfish use and problems. The stocks seem to be in good condition and, although minor problems were reported, investigation revealed no specific or major problems.

The recreational use of crawfish is unknown except that many people fish for them for bait and for food. Commercial crawfish catch records date from 1893 and are shown in Table 33. Environmental changes have probably played an important role in the general decline of the fishery. The commercial fishery is located mainly in the lower Columbia and Willamette rivers.

Mussels

The California or sea mussel is abundant in nearly all rocky areas along the coast. Mussels, while little used, are more commonly taken for bait than for food by the recreational user. The only commercial harvest recorded since 1970 was 0.4 t (949 lb.) in 1973 and 0.2 t (394 lb.) in 1975; all of the mussels were used for bait.

Bait Shrimp

Mud and ghost shrimp are abundant in most of our estuaries. The 1971 recreational use survey showed an estimated 347,000 shrimp were harvested for bait in 1971. The commercial harvest from 1970 to 1975 is shown in Table 34. The intertidal and subtidal bay clam surveys have revealed that ghost shrimp populations are barely being touched by the bait fishery.

Intertidal Animals

Regulations governing the harvest of nonfood intertidal animals were enacted in 1962. Recreational users, including teachers and students, were restricted to 10 animals in the aggregate per day. Seven areas were set aside for collecting by permit only and the Marine Gardens area at Otter Rock was closed to all collecting.

Table 35 shows the harvest reported by permit holders and the commercial harvest from areas open for collection. The bulk of the commercial harvest is composed of starfish and shore crabs and, in some years, tube worms.

Table 33. Commercial crawfish landings in Oregon, 1893-1975.

Year	Pounds Landed	Number of Licenses	Year	Pounds Landed	Number of Licenses
1893	66,288		1935	79,300	39
1894	72,000		1936	86,900	37
1895	76,055		1937	84,200	34
1896	96,000		1938	93,700	25
1897	120,000		1939	98,900	31
1898	140,000		1940	100,400	24
1899	138,248		1941	51,900	23
1900	111,321		1942	23,600	16
1901	62,445		1943	26,128	11
1902	21,673		1944	28,625	12
1903	8,650		1945	26,568	21
1904	8,800		1946	35,035	28
1905	9,100		1947	52,722	24
1906	13,500		1948	42,285	18
1907	5,800		1949	53,750	14
1908	42,360		1950	44,813	19
1909	45,720		1951	44,453	19
1910	9,490		1952	60,408	14
1911	10,640		1953	52,918	18
1912	132,843		1954	46,596	15
1913	137,000		1955	32,711	24
1914	141,000		1956	30,503	25
1915	146,610	52	1957		
1916	128,643	46	1958		
1917	101,693	37	1959		
1918	50,787	20	1960		
1919	62,000		1961		
1920	74,000		1962		
1921	86,500	32	1963	7,000	
1922	89,500	33	1964	15,800	
1923	80,500	30	1965	8,700	
1924	143,200	51	1966	2,000	
1925	125,500	45	1967	5,400	
1926	116,500	42	1968	2,200	
1927	134,500	48	1969	5,200	
1928	158,200	44	1970	39,019	30
1929	146,000	44	1971	39,537	43
1930	176,800	54	1972	8,730	7
1931	123,000	43	1973	9,942	16
1932	80,000	22	1974	12,094	12
1933	99,000		1975	26,279	10
1934	143,600				

Table 34. Bait shrimp landings in Oregon, 1970-75.

Year	Landings	Pounds	Number of Licenses
1970	290	6,349	9
1971	432	8,002	18
1972	651	10,082	25
1973	852	12,756	37
1974	830	14,628	30
1975	1,003	19,916	27

Table 35. Number of nonfood intertidal animals taken by recreational and commercial collectors in Oregon, 1962-75.

Year	Recreational	Commercial
1962	52,000	88,000
1963	35,000	18,000
1964	24,000	36,000
1965	38,000	68,000
1966	123,000	33,000
1967	35,000	105,000
1968	13,000	204,000
1969	13,000	118,000
1970	40,000	110,000
1971	39,000	92,000
1972	101,000	60,000
1973	17,000	67,000
1974	20,000	43,000
1975	18,000	43,000

Oysters

About 1,134 hectares (2,800 acres) of land are held as oyster claims in Tillamook, Netarts, Yaquina, and Coos estuaries. Because these oysters (mostly varieties of the Japanese or Pacific oyster) do not reproduce in Oregon estuaries, seed oysters are bought and planted by the grower. Most of the seed comes from Japan with lesser amounts from Washington, California, and Canada. Spat failures in recent years in Washington and Canada and high prices for Japanese seed have posed problems to the Oregon industry. The annual harvest has ranged from 22,000 to 71,265 gallons (Table 36).

Table 36. Oregon oyster harvest (in gallons), 1966-75.

Year	Gallons	Year	Gallons
1966	29,412	1971	34,875
1967	47,716	1972	22,000
1968	71,625	1973	24,750
1969	60,146	1974	29,250
1970	38,375	1975	23,756

The native oyster supports a small commercial harvest, but populations are so small and so distributed that no sport or personal use fishery exists. A recreational fishery (on any species) would have to be supported by a hatchery put-and-take program.

HABITAT

District fishery biologists spent a considerable amount of time and effort investigating removal and fill permits, Corps of Engineers permits, Forest Practices Act activities, road construction, stream channel work, barriers and fishways, water rights, pollution and siltation, and other miscellaneous activities. Table 37 summarizes the environmental investigations in 1975.

This section briefly describes some of the habitat protection and rehabilitation and development projects worked on during 1975. The information is presented by regions.

NORTHWEST REGION

Protection

Highway reconstruction along Gellatly Creek (Marys River) necessitated a major channel change; however, the new channel was formed to simulate a natural stream and little habitat will be lost once cover is reestablished.

Stream bank erosion control was undertaken on Tillamook County streams by the Soil Conservation Service. Most of the work involved the placement of heavy riprap rock.

The Corps of Engineers dredged two areas in Siuslaw Bay and filled the last approved upland disposal sites. Future dredging within the estuary is dependent upon additional disposal sites being found.

Log storage in Siuslaw Bay continued to hinder boating anglers. A report describing the impacts of log rafting on the fishery was sent to the Department of Environmental Quality and the Division of State Lands.

Flood control proposals for Clark and Pringle creeks in Salem were reviewed and recommendations made to maintain some type of open stream rather than using culverts or concrete channels.

The first attempt at coordinated watershed planning in western Oregon was undertaken for the Fall Creek watershed in the Alsea system. The Soil Conservation Service acted as the lead agency and coordinator.

The Cascade Head Scenic Research Area management program was reviewed and comments submitted. The goals and management of the area will have some effect on the operation of the new Salmon River Hatchery.

Table 37. Summary of environmental investigations by district biologists, 1975.

Investigations	Number Examined					
	Region					
	Northwest	Southwest	Central	Northeast	Southeast	Total
Removal and Fill Permits	252	322	54	155	32	815
Corps of Engineers Permits	82	34	0	28	0	144
Channel Changes	26	26	6	19	6	83
Forest Practices Act	99	72	9	110	2	292
Road Construction	64	49	19	16	16	164
Barriers 1/	34	47	2	9	0	92
Fishways	32	46	12	53	0	143
Pollution and Siltation	50	36	11	91	1	189
Water Rights	108	39	0	41	10	198
External Planning Projects 2/	86	36	32	18	13	185
Miscellaneous	102	104	6	0	7	219
Totals	935	811	151	540	87	2,524

1/ Includes culverts, logjams, beaver dams, etc.
2/ Includes planning requests for County, City, Port, OCDC, etc.

Rehabilitation and Development

An old, nonfunctional fishway on Hennings Dam on the South Fork of the Alsea River was made operational. Fish passage was improved at the new City of Silverton water supply dam (Silver Creek) by modifying the present fishway. Fishway repairs were undertaken on North Fork of the Nehalem (Hamlet Falls) and Mill Creek (tributary of the Siletz River). Rock-cut fishways were blasted at the falls on Crabtree Creek (Tualatin River) and Butte Creek (Pudding River). An additional entrance was added to the fishway at Willamette Falls.

Plans were made and permits obtained for the placement of an artificial reef in Tillamook Bay. The reef, constructed of old auto tires, should provide additional fish habitat and angling opportunity.

Old tires and concrete tile were placed in one of the St. Louis ponds to provide habitat for warm-water fish. The Oregon Bass and Panfish Club made plans to place tires in six additional ponds.

Construction of brush shelters at Whistler's Bend Pond (Douglas County) was concluded. The shelters were constructed in an attempt to reduce predation on fingerling bass by mergansers and adult bass. Ten brush-covered forms totaling 69.6 m^2 (748 ft^2) were sunk at depths of 1.2 to 1.8 m (4 to 6 ft). Thirty-one brush piles consisting of two to four large tree limbs were sited along the pond perimeter at depths of 0.6 to 1.2 m (2 to 4 ft).

Construction work on the St. Louis Ponds was terminated by the Oregon State Highway Division. Seven ponds were completed and two were left uncompleted.

The Northwest Steelheaders assisted in the placement of a gabion across Buck Creek (Siletz River) to create additional steelhead spawning and rearing habitat. The area was being used by spawning steelhead in December.

Log jams were removed from 17 streams to open 32.2 km (20 miles) of spawning area.

SOUTHWEST REGION

Protection

A cooperative study of the proposed Days Creek Dam project (Umpqua River) was undertaken by the Corps of Engineers, National Marine Fisheries Service, U. S. Fish and Wildlife Service, and the Umpqua Research Company. Of primary concern was turbidity and concentrations of arsenic and mercury in the proposed reservoir.

Construction of Elk Creek Dam on the upper Rogue River was removed from the Corps of Engineers plans for the upper Rogue development. The withdrawal of support by the Oregon Water Resources Board was the deciding factor although public controversy also had some bearing on the issue.

Siltation in Bear and Ashland creeks continued to be a problem. The City of Ashland made plans to purchase a dredge to remove the material that has flushed down Ashland Creek from their reservoir.

Fish kills were investigated on Canyon Creek (South Umpqua) and Williams Creek (Applegate River). A gasoline spill into Canyon Creek killed aquatic organisms and at least 12 cutthroat trout in a 3.2 km (2-mile) section of the stream. An aquatic herbicide which had been applied to an irrigation ditch killed approximately 75 juvenile steelhead in Williams Creek.

Mining activities continued to be a problem in the Southwest Region but communications with miners are improving. Several meetings were held with miners and our concerns explained.

Rehabilitation and Development

The Soil Conservation Service and the County Extension Service cooperated in a grass and shrub seeding program on road construction projects in Curry County. The U.S. Forest Service conducted similar work on its roads and initial results were promising. Stream banks along the North Fork Coquille River were planted with 250 hybird poplar trees and 200 trees were planted along the South Fork Coquille and Elk Creek. Both plantings were experimental.

The "Tru-mix" ponds at Central Point have been acquired by Jackson County to be included in the County Exposition Park. The ponds will be developed for public angling.

Improvements to the fishway were made at Middle Creek (Coquille River), North Fork Butte Creek, Antelope Creek (Little Butte Creek), and Foots Creek (Rogue River).

Log jams were removed from 16 streams to open 48.3 km (30 miles) of spawning area.

Ninety-seven fish protective screens were operated in the region during 1975.

CENTRAL REGION

Protection

The Tumalo irrigation flume (Bend District) was replaced with 4.8 km (3 miles) of pipe. The contractor began work without obtaining a fill and removal permit and the work, as engineered and accomplished, was not in conformance with the original environmental assessment. In the process of building the roadbed and then digging to install the pipe, fill material was pushed into the Deschutes River in a number of places, riparian vegetation was cut, and shoreline habitat destroyed. Compliance with legal requirements was finally achieved and the work completed.

Cooperative planning with the Soil Conservation Service resulted in stream channel work being done on six streams to ODFW specifications. Riprap, fencing, and plantings were placed on 38.1 km (23.7 miles) of stream in the Columbia District.

The Deschutes National Forest was requested to protect fish habitat and provide fish passage on the Cascade Lakes Highway improvement project between Bachelor and Butte and Elk lakes.

Rehabilitation and Development

A falls developed in an unstable area on the West Fork Hood River and a temporary fishway was installed to provide passage. Equipment was later brought in to lower the falls. Fish passage was improved on Shitike Creek (on the Warm Springs Indian Reservation) by blasting several large boulders in a constricted area of the stream. Culverts on Jack and Canyon creeks (Metolius River) were replaced with bridges by the U.S. Forest Service.

A cooperative habitat improvement project on the Williamson River was undertaken by the Winema National Forest, ODFW, the Klamath County Flycasters, and students from Mazama Midhigh School. Fences were built and trees planted along 1.6 km (1 mile) of stream. The project was initiated in 1974 and continued in 1975.

A rainbow trout spawning area was created in Spring Creek (Williamson River) by installing gabions and approximately 230 m^3 (300 yds^3) of gravel. Rainbow used the area for spawning in the fall.

Partial removal of rough fish was undertaken at East, Paulina, Big Lava, and Simtustus lakes. Rotenone was used at East Lake and approximately 200,000 yearlings and 50,000 adult roach were killed. Treatment of selected areas in Paulina Lake killed approximately 100,000 yearling and 1,000 adult roach. Over 150,000 yearling roach were removed at Big Lava Lake. Two small

areas along the shoreline of Lake Simtustus were treated with rotenone and nearly 5,000 rough fish, primarily suckers and squawfish, were killed.

Antimycin was used to treat a 3.5 hectare (8.6 acre) bay on Lake Simtustus. The treatment was effective to a depth of 1.5 m (5 ft). Dead fish were observed along a 0.4 km (0.25-mile) stretch of shoreline the following day and indicated a considerable amount of the chemical drifted out of the treatment area.

NORTHEAST REGION

Protection

Flooding in northeast Oregon streams resulted in emergency bank repair and channelization work being done on a number of streams. Interagency and landowner cooperation was virtually nonexistent at the onset of the program. However, several meetings were held before the work was done and the projects were completed in a manner that would cause the least damage to the fishery resource.

The Grande Ronde planning unit proposal of the U.S. Forest Service was reviewed. Recommendations were made to maintain the present grazing level which would provide for an increase in the late season streamflows. Other alternatives would increase use and reduce riparian vegetation.

An interagency inspection team found about one-half of the large irrigation pumping stations on the Columbia River were inadequately screened. The new Maxwell Ditch screen operated satisfactorily except during periods of high water. The Stanfield screen was scheduled for replacement before the 1976 irrigation season.

Two hundred and eighty-one fish screens were operated in the John Day system in 1975. Bypass traps were operated at 33 of the screens and 14,092 summer steelhead and 193 spring chinook downstream migrants were captured. The number of chinook recovered was 117% higher than in 1974 while the steelhead count was 24% higher.

Eighty-eight rotary fish screens were operated in Wallowa County in 1975. Twenty-two of the screens had live-boxes attached to obtain information on trends in numbers of downstream migrant salmon and steelhead passing through the bypass pipes. A partial sample revealed 11,000 downstream migrants were trapped at these screens in 1975 compared to a catch of 14,045 fish in 1974.

Rehabilitation and Development

Approximately 1,633 kg (3,600 lb.) of rough fish were removed by electrofishing from the Grande Ronde River between the Wallowa

River and Wildcat Creek. After removing the rough fish, the section was stocked with 20,000 rainbow fingerlings.

Over 30 potential impoundment sites on the Powder River were inventoried in the dredge tailing area at Sumpter. Two sites were investigated to determine if the water was suitable for trout and if satisfactory water levels could be maintained through the summer.

Two reservoir sites, one on Swale Creek and the other at John Young Meadow on upper Murderer's Creek, were core drilled to determine if the geology would allow for dam construction. The Swale Creek site was marginal but the John Young Meadow site would be suitable for construction.

Fish attractors, in the form of bunched auto tires, were placed in Thief Valley Reservoir to improve warm-water fish habitat.

SOUTHEAST REGION

Protection

Plans for construction of Coffeepot and Cox Creek reservoirs were reviewed. Studies conducted by the U.S. Forest Service indicated that Coffeepot Reservoir is likely to be turbid; however, fish have survived in other reservoirs with higher levels of turbidity than are predicted. Recommendations were made for minimum pool level and fish passage at the Thomas-Cox Creek reservoir project.

Rehabilitation and Development

Attempts were made to establish riparian vegetation in several areas. Trees and shrubs were planted around Beckers Pond in Ontario; however, less than 10% survived. A portion of the Whitehorse Creek burn was seeded with yellow sweet clover and wheat grass. A bank cover of yellow sweet clover and reed canary grass was established on the Middle Fork of the Malheur River. Four tree species and two different kinds of shrubs were planted along Ana River but survival appears to be low.

Lofton Reservoir was treated with Diquat to remove a dense weed growth prior to treating the reservoir with rotenone to remove catfish. However, high water temperature and time factors necessitated the postponement of the rotenone treatment.

FISH PROPAGATION

HATCHERY OPERATIONS

Production

Prior to merger, all fish production and distribution records of the former Wildlife Commission were kept on a calendar year basis and those of the former Fish Commission on a brood year basis. Thus, there were some differences between the two reporting systems. The tables in this section represent a blend of the two systems.

Salmonid Production

Total egg take in 1975 was 108,254,300 eggs collected from a variety of salmonid brood stocks. Egg collection by species and hatchery is shown in Table 38.

Fish feed utilized in 1975 totaled 5,656,149 lb. of which 5,453,344 lb. was fed to production stocks and 202,805 lb. to brood stocks. A total of 76,033,771 fish (3,292,650 lb.) were produced for release. A summary of fish food fed (in pounds) and production releases by hatchery appears in Table 39.

Warm-water Production

Warm-water game fish produced in the St. Paul Rearing Ponds were used to fulfill district requests and to maintain an adequate stock for the new St. Louis Ponds. Year-end production and inventory data for the St. Paul Ponds is presented in Table 40.

Problems were encountered at the St. Paul Ponds in holding yearling and adult bass since an adequate supply of forage fish of the proper size was not readily available.

A major die-off of older adult bluegill occurred during the peak of the hot weather. The problem was particularly severe in ponds which had not been drained in the past 12 months.

The 1975 bass production from Whistler's Bend Brood Pond totaled 13,580 fingerlings. It is believed that production is being held down by predation by newts, mergansers, and larger bass.

Distribution

Salmonid Distribution

The number and pounds of salmonids, by species, stocked into each of the 18 watersheds within the state in 1975 is shown in Table 41.

Table 38. Eggs collected at Oregon Department of Fish and Wildlife hatcheries, calendar year 1975.

Hatchery	Chinook		Coho	Steelhead		Trout [1/]	Total
	Fall	Spring		Winter	Summer		
**Alsea Salmon			4,059,200				4,059,200
*Alsea Trout				2,086,400		707,200	2,793,600
*Bandon						824,600	824,600
**Big Creek	11,704,200		1,093,000	1,414,900			14,212,100
**Bonneville	17,796,000		1,115,000				18,911,000
*Butte Falls		301,100					301,100
**Cascade	11,355,000		1,177,900				12,532,900
*Cedar Creek							-0-
*Cole River		1,150,100	78,900	359,900	365,100		1,954,000
**Elk River	2,123,000						2,123,000
*Fall River						1,490,500	1,490,500
*Gnat Creek							-0-
*Klamath						961,800	961,800
**Klaskanine			1,002,500				1,002,500
*Leaburg						839,400	839,400
**Marion Forks		1,854,800		146,100			2,000,900
**McKenzie		147,700					147,700
**Nehalem			218,800	74,500			293,300
*Oak Springs						8,728,000	8,728,000
**OxBow							-0-
*Roaring River					365,900	8,738,600	9,104,500
*Rock Creek				83,800	278,100		361,900
*Round Butte		248,700			1,775,000		2,023,700
**Sandy			5,012,000				5,012,000
**Siletz			577,200				577,200
**S. Santiam		2,087,000			1,471,000		3,558,000
**Trask	1,365,100	1,159,100	733,500				3,257,700
**Willamette Salmon		1,874,700					1,874,700
*Willamette Trout						5,284,800	5,284,800
*Wizard Falls						4,024,200	4,024,200
TOTAL	44,343,300	8,823,200	15,068,000	4,165,600	4,255,100	31,599,100	108,254,300

1/ Includes seven species of trout

* Former Wildlife Commission hatcheries.
** Former Fish Commission hatcheries.

Table 39. Pounds of food fed and number and pounds of fish released from Oregon Department of Fish and Wildlife hatcheries, 1975.

Hatchery	Pounds of Food Fed: Brood Fish	Pounds of Food Fed: Fry, Fingerling Yearlings	Pounds of Food Fed: Total Pounds	Fish Releases: Number Released	Fish Releases: Pounds Released
** Alsea Salmon		123,678	123,678	3,416,965	83,333
* Alsea Trout	13,090	206,330	219,420	1,296,409	137,060
* Bandon	5,032	113,344	118,376	546,731	55,111
** Big Creek		200,764	200,764	7,047,843	141,317
** Bonneville		314,120	314,120	10,793,786	134,228
* Butte Falls		108,207	108,207	132,008	35,954
** Cascade		191,416	191,416	2,420,907	153,325
* Cedar Creek		242,643	242,643	1,093,650	163,813
* Cole Rivers	1,090	218,182	219,272	441,599	83,698
** Elk River		126,192	126,192	2,032,102	106,341
* Fall River		85,280	85,280	1,389,516	55,320
* Gnat Creek		104,155	104,155	597,353	82,703
* Klamath	10,376	155,567	165,943	3,849,955	118,300
** Klaskanine		165,230	165,230	1,564,384	123,640
* Leaburg	8,600	469,230	477,830	1,055,990	301,817
** Marion Forks		191,822	191,822	1,356,898	62,971
** McKenzie 1/		0	0	0	0
** Nehalem		170,715	170,715	1,280,490	87,838
* Oak Springs	95,600	362,040	457,640	3,203,056	204,503
** OxBow		196,618	196,618	3,288,585	59,055
* Roaring River	44,450	177,081	221,531	608,148	104,875
* Rock Creek		35,953	35,953	874,654	86,597
* Round Butte	590	80,990	81,580	658,904	59,327
** Sandy		122,045	122,045	1,575,185	68,869
** Siletz		59,248	59,248	554,285	34,089
** S. Santiam		82,450	82,450	3,939,587	38,751
** Trask		66,750	66,750	1,604,411	71,294
* Wallowa		78,780	78,780	366,478	52,644
** Willamette Salmon		430,069	430,069	2,541,642	187,032
* Willamette Trout	18,150	139,340	157,490	1,174,097	86,972
* Wizard Falls	5,827	111,355	117,182	246,305	64,936
Ponds					
** Aumsville Ponds		191,550	191,550	14,081,695	169,406
** Trask Pond		132,200	132,200	1,000,153	77,531
TOTAL	202,805	5,453,344	5,656,149	76,033,771 2/	3,292,650

* Former Wildlife Commission hatcheries.
** Former Fish Commission hatcheries.

1/ McKenzie under construction.
2/ Does not include releases from St. Paul Ponds (25,744 at 577 lb.) and from Hagerman and Winthrop federal fish hatcheries (246,335 at 7,541 lb.).

Table 40. Summary of pond production at the St. Paul Rearing Ponds, 1975.

Pond No.	Species 1/	Number	Weight	Size (inches)	Remarks
1	LB	1,985	34 lb.	FL 4.4	Reared from fry.
2	BC	2,986	109 lb.	FL 4.0	
	BC	15	2.7 lb.	Adult	
	CC	1,382	173 lb.	FL 7.3	
	Misc.	134	6 lb.	--	
3	LB	250	10.8 lb.	FL 4.9	
	BG	501	56 lb.	FL 5.2	
	Misc.	2	--	--	
4	CC	1,269	134 lb.	FL 6.8	
	BG	668	87 lb.	FL 6.1	
	LB	42	3.8 lb.	FL 5.4	
	Misc.	24	2 lb.	--	
5	LB	18,914	211 lb.	FL 2.9	Transfer from Whistler's Bend Pond To S.E. Region.
	WC	382	73.5	Adult	
	Misc.	16	5 lb.	--	
6	CC	1,031	245.8 lb.	FL 8.9 & 13.1	Heavy loss of adult BG and LB.
	BG	582	37.8 lb.	FL 3.8	Not drained in 1974.
	LB	10	2.6 lb.	FL 7.8	
7	LB	3	5 lb.	Adult	Natural reproduction
	LB	2,867	42 lb.	FL 3.3	
	SB	1	1 lb.	--	
8	CC	1,103	214 lb.	FL 8.4	Heavy loss of LB and adult BG.
	BG	321	29.5 lb.	FL 3.3 & 6.3	
	LB	19	1.8 lb.	FL 6.3	Not drained in 1974.
	GS	50	5.8 lb.	FL 5.4	
9	BG	5,346	4 lb.	Fingerling	To Wineland Lake.
	BG	200	30.8 lb.	FL 5.5	Poor survival on adult SB.
	CC	923	148.6 lb.	FL 7.9	Midsummer die-off of older BG.
	LB	31	17.5 lb.	FL 9.8	
	SB	1	1.6 lb.	FL 13.0	
10	BG	1,794	161.5 lb.	FL 5.0	Not drained in 1974.
	LB	25	22.6 lb.	FL 12.0	Some die-off of LB and BG.
	LB	36	6 lb.	FL 6.9	
	BC	54	10 lb.	FL 7.0	
	CC	186	48.9 lb.	FL 8.5	
	CC	18	19.9 lb.	FL 14.5	
	Misc.	15	2 lb.	--	
Holding Pond	Not inventoried in 1975				

1/ LB=largemouth bass; SB=smallmouth bass; BC=black crappie; WC=white crappie; CC=channel catfish; BG=bluegill sunfish.

Table 41. Number and pounds of trout, steelhead, and salmon stocked by watershed (drainage basin), 1975. 1/

Watershed	Drainage Basin	Trout						Steelhead		Salmon				
										Chinook				
		Rainbow	Cutthroat	Brook	Brown	Dolly Varden	Atlantic Salmon	Summer	Winter	Spring	Summer	Fall	Coho	Total
1	North Coast	42,626 14,953	92,357 24,468					270,637 24,195	833,886 104,229	801,316 43,353		6,632,884 103,348	5,088,371 364,044	13,762,076 678,590
2	Willamette	2,351,592 347,466	29,096 3,137	367,082 2,090				493,016 68,360	211,405 27,231	7,498,797 285,106		14,393,672 172,119	448,112 11,798	25,792,772 917,307
3	Clackamas/ Sandy	405,071 99,046	6,260 19	26,036 134				189,645 26,188	301,767 44,112	51,200 4,000		12,754,813 111,571	4,824,338 288,108	18,559,130 573,178
4	Hood	36,401 12,696	28,170 7,609	11,000 55				296,330 18,151						371,901 38,511
5	Deschutes	2,516,438 152,907	17,966 53	538,310 3,638	39,060 666		4,310 2,972	414,669 33,747		143,998 21,324	59,320 1,319		115,111 1,318	3,849,182 217,944
6	John Day	190,117 25,896		26,206 202										216,323 26,098
7	Umatilla	119,742 15,449						11.094 1,199						130,836 16,648
8	Grande Ronde	188,948 37,364		2,125 12		17,401 1,631		49,650 3,310						258,124 42,317
9	Powder	773,382 25,227	61,180 255	7,905 46									100,700 479	943,167 26,007
10	Malheur	272,965 6,033												272,965 6,033
11	Owyhee	69,586 1,824												69,586 1,824
12	Malheur Lake	149,241 13,912												149,241 13,912
13	Goose and Summer Lks	318,244 29,791	978 279											319,222 30,070
14	Klamath	1,204,299 41,974	6,552 19	36,610 239									19,250 275	1,266,711 42,507
15	Rogue	822,782 41,577	4,484 954	75,590 240				118,312 29,201	113,124 17,761	290,253 42,242		339,696 34,096		1,764,241 166,071
16	Umpqua	483,966 47,247	30,358 7,560	34,528 203				117,725 16,411	75,194 10,863	145,946 22,906			225,759 17,934	1,113,476 123,124
17	South Coast	291,429 17,993	161,489 9,667	500 6				77,927 1,571	263,399 28,912			1,631,617 63,435		2,426,361 121,584
18	Mid Coast	95,982 33,938	82,431 23,139					79,504 13,668	785,625 70,299	196,715 903		205,083 19,147	3,569,452 97,372	5,014,792 258,466
TOTAL		10,332,811 965,293	521,321 77,159	1,125,892 6,865	39,060 666	17,401 1,631	4,310 2,972	2,118,508 236,001	2,584,400 303,407	9,128,225 419,834	59,320 1,319	35,957,765 503,716	14,391,093 781,328	76,280,106 3,300,191

NOTE: Lower figures denote pounds of fish stocked.
Former Wildlife Commission hatcheries listed releases by calendar year 1975 while former Fish Commission hatcheries listed releases by brood year.

1/ Includes fish from Hagerman and Washington federal hatcheries and brood fish stock.

Large liberation tankers tallied 302,672 miles in 1975 while portable units traveled an additional 14,468 miles. A reduction of 30,496 miles was made from 1974 total mileage.

Warm-water Distribution

Statewide distribution of warm-water game fish in 1975 totaled 28,693 fish weighing 504 kg (1,111.7 lb.). A record of waters stocked is presented in Table 42.

TECHNICAL SERVICES

Hatchery Practices

Marine recoveries of marked 1970- and 1971-brood Trask fall chinook indicate that 62%, 27%, 1%, and 0% are landed in British Columbia, Alaska, Washington, and Oregon marine fisheries, respectively. Approximately 34% of the total Big Creek recovery was landed in the Columbia River gill-net fishery, while 28% of the total Trask recovery occurred in the Tillamook Bay sport fishery.

Pilot studies to assess techniques for determining pond loading levels at hatcheries were completed using 1973-brood Sandy Hatchery coho. An experiment was conducted to test the inter-relationships of three loading levels in terms of pounds per gallon per minute and three hatchery constants in terms of feeding rates.

Marked coho were released from Alsea and Klaskanine hatcheries to determine the influence of various release dates on survival.

Infectious Diseases

Fish health was monitored and disease outbreaks investigated at Department hatcheries, rearing ponds, and spawning sites.

An injectable vaccine against Aeromonas salmonicida was effective in preventing furunculosis in coho salmon whereas three oral vaccine preparations were ineffective.

An attenuated strain of IHN virus has shown good potential for use as a live vaccine against IHN disease. Further studies on this vaccine are required.

Stocks of fall chinook salmon from drainage systems known to contain the infectious stage of Ceratomyxa shasta show a greatly increased resistance to the parasite. This geographical correlation of resistance to C. shasta appears to be true for steelhead but not as clearly demonstrated with spring chinook.

Table 42. Warm-water game fish stocking, by region, in 1975.

Region	Waters Stocked	Date	Species Stocked 1/	Number Stocked	Pounds Stocked	Size Stocked (inches)
Northwest	Barnick Pond	7-8	LB	1,000	--	Fry
	Barnick Pond	10-9	BC	846	31.0	4.0
		10-9	CC	772	91.5	6.9
	Bond Butte Pond	3-14	CC	475	43.0	5-8
	Cullaby Lake	12-3	LB	2,843	67.7	3.3
	Huddleston Park Pond	8-22	LB	316	10.0	Fing.
	O.C.I. Pond	5-13	BG	325	2.0	1-5
	Wilsonville Pond	10-2	LB	56	3.0	3-4
Southwest	Empire Lake - Lower	10-10	BC	430	16.0	4.0
	Empire Lake - Upper	10-10	BC	890	33.0	4.0
Central	Klamath G.M.A. Pond	6-1	WC	29	10.0	7.0
Northeast	Burnt River	7-10	SB	92	45.0	6-16
	Powder River	7-10	SB	90	45.0	6-16
	Umatilla River	7-10	SB	208	104.0	6-16
Southeast	Arritola Reservoir	4-23	LB	1,800	20.0	2-5
	Arritola Reservoir	6-11	LB	97	219.0	Adult
	Bigfoot Reservoir	4-22	LB	4,500	49.0	2-5
	Bigfoot Reservoir	5-6	LB	149	50.0	2-18
	Bully Creek Reservoir	4-11	LB	11,185	123.0	2-5
	Campbell Pond	9-17	SB	250	2.5	Fing.
	Chewaucan River	9-11	LB	1,611	34.0	4.4
	Drews Reservoir	10-16	WC	381	73.5	4-10
	Owyhee Springs Reservoir	4-23	LB	181	2.0	2-5
	Rogers Pond	4-8	LB	92	30.0	5-12
	Willow Creek Reservoir	4-24	BrB	75	7.5	3-10
TOTAL				28,693	1,111.7	

1/ LB=largemouth bass; SB=smallmouth bass; BC=black crappie; WC=white crappie; CC=channel catfish; BG=bluegill sunfish; BrB=brown bullhead.

Nutrition - Physiology

Manipulating the feeding frequency of relatively high-protein diets appears to be a better technique for controlling fish growth rates than the use of low-protein feeds.

"Salty" herring meals containing more than 5.4% sodium chloride produced significantly reduced feed efficiencies and weight gains when incorporated in Oregon Pellets fed to spring chinook.

Addition of a readily digestible carbohydrate (glucose) to a moist pellet containing 52% dry weight protein and 24% fat did not spare protein, improve feed efficiency, or affect weight gains of juvenile chinook. The excess carbohydrate was not stored as fat.

Field trials completed to date show that coho salmon fed Abernathy Dry Diet may survive to adulthood at rates comparable to those experienced by fish fed Oregon Pellets.

Supplementation of Oregon Pellets with a "high-potency" vitamin pack did not significantly affect fish fitness or the ability of coho salmon to survive following release.

Coho salmon fed restricted quantities of food on an every-other-day basis converted their food as efficiently and grew at the same rate as fish fed the same amounts of feed apportioned daily. There were no significant differences in fish size variation or total feeding time required between the two techniques.

Fish fed "high-fat" diets (approximately 6% supplemental oil) have survived to adulthood at significantly higher rates than those fed "low-fat" rations (less than 2% added oil) in two of three field trials for which data on hatchery recoveries of marked fish are complete.

Results of three field studies have shown that raising coho salmon in "Burrows" rectangular, circulating ponds at North Nehalem Hatchery does not produce "higher quality" populations with increased potential for survival in the wild.

Mark Processing

The Mark Processing Section published two reports in 1975. The first was a tag-use report that documented the use of fin marks in conjunction with coded-wire tags in studies of Pacific salmon and steelhead trout. Personnel of the section contacted appropriate state, federal, and Canadian fishery agencies to ensure accuracy and completeness of the information.

The second report documented recoveries of fin-marked and coded-wire tagged fish made during sampling of Pacific Coast fisheries. It included information on estimated catches of marked fish made in the various fisheries.

FISH PLANNING

The purpose of long-range planning by the Department is to manage Oregon's fish and wildlife resources for optimum benefits to all of its citizens. Implementation of a planning system will:

1. Challenge ongoing and proposed actions to assure that they contribute fully to accepted long-range goals and strategies.

2. Provide decision-makers with a well-ordered series of alternatives.

3. Strengthen the Department's position in resource conflicts with other interests.

4. Provide the agency an advanced budgeting and performance control system.

5. Present a mixture of projects and activities that will meet specified objectives at a minimum cost.

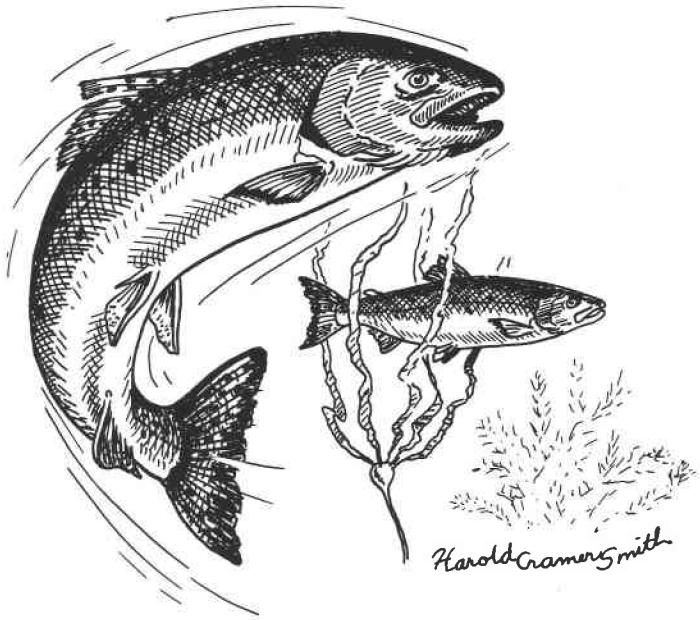
Long-range planning for fish and wildlife began in 1970 when the Oregon Game Commission entered into a cooperative program with the U.S. Fish and Wildlife Service to develop a comprehensive Sportfish and Wildlife Plan. A three-man planning team was created to spearhead this effort. The major effort during the first few years was to develop a large data base upon which the plan would be developed. A data storage and retrieval system was set up to permit storage and rapid retrieval of large quantities of data.

The fish and wildlife plan evolved to its present draft status following a 2-year period of interviews, draft reviews, and further input from field and staff biologists. The plan recommends goals and objectives to pursue over the next 15 years, identifies problems in meeting these goals and objectives in the face of increasing numbers of hunters and anglers and, finally, recommends strategies for overcoming the problems cited. Sixty copies of the draft were distributed to the staff and Commission for final review.

The present plan was developed by the Oregon Wildlife Commission prior to merger of that agency with the Fish Commission. The highest priority is now being given to the development of additional plans to cover shellfish management, commercial fisheries, and other functions of the former Fish Commission which are missing from the present plan. As these plans are developed and approved, they will be included in an updated revision to include all fisheries.

Planning Procedures, a companion document prepared in 1975, presents in detail the forms and formulas used, the assumptions made, and other details of development of the Sportfish and Wildlife Plan.

A third document, Fisheries Data Catalog, was developed in 1975. The Data Catalog is a compilation of fish distribution and population data, sport harvest, lake and stream habitat statistics, and related information summarized by county.



FISH RESEARCH

The Research Section primarily provides management with new information or techniques to improve existing programs or give direction to new ones.

Following is a summary of the projects worked on in 1975.

Catchable Rainbow Trout Evaluation

In order to measure the contribution of hatchery-reared rainbow trout to the Oregon sport fishery, and recommend techniques for better utilization of catchable trout, five representative streams in the Willamette Valley were studied in 1975. Using creel census assessment, catch rates for the five streams (Middle Fork of Willamette River, Little Luckiamute River, Quartzville Creek, Mill Creek, and South Santiam River) ranged from 0.5 to 1.0 rainbow per angler hour, and 0.8 to 1.3 rainbow per angler. From 64% to 83% of the fish planted in the streams were caught by anglers. The study period was from the opening day of trout season through Independence Day weekend, a period of 10 weeks.

Studies of two genetic strains of rainbow trout and their hybrids planted in Mill Creek (middle Willamette District) revealed statistically significant (95% C.I.) differences in the movement of groups out of the stream and catches of various groups by anglers. Roaring River strain rainbow trout had the tendency to move out of the stream, while Cape Cod strain rainbow tended to remain in the stream and were found in angler creels in the greatest numbers.

A report was prepared and issued on stocking statistics for the State of Oregon, 1952-75. Background information was gathered for another report on the status of rainbow trout brood stocks in Oregon hatcheries.

Genetic Studies of Anadromous Salmonids

A survey of gene frequencies in steelhead trout from many of Oregon's coastal streams was completed. Gene frequencies were estimated from the electrophoretic phenotypes of enzymes. These data will serve as a basis for examination of the breeding structure of these steelhead and for comparisons of hatchery and wild fish.

The relative growth and survival of offspring from hatchery and wild summer steelhead was determined in streams.

A detailed study of gene frequencies for Rogue River steelhead trout was completed. The results showed a diversity of biochemical variants. These data provide a description of the

Rogue River steelhead prior to the completion of several water development projects in the river.

Brood stock selection to evaluate the heritability of time-of-return, age-at-maturity, and body size were continued with the 1976 brood steelhead trout at the Alsea Trout Hatchery.

Studies were continued to describe the characteristics of Umpqua River and Alsea River steelhead trout as they existed earlier (from existing records) and as they are today.

Willamette River Steelhead Study

Over 600,000 Skamania stock summer steelhead smolts were released into the Willamette system in the spring of 1975. Adult returns have fluctuated between a high of 4% of smolt releases on the South Santiam River to less than 1.0% on the North Santiam and McKenzie rivers. Although Skamania stock is resistant to Ceratomyxa shasta it may not be the best stock for some tributaries of the Willamette system. Live-box studies have shown that Deschutes and Rogue stocks of summer steelhead are more resistant than Skamania fish to combined effects of bacterial disease and increasing temperatures found in the lower Willamette River. Any delay in out-migration could be critical to smolt survival.

Due to low returns of adult summer steelhead to the North Santiam and McKenzie rivers, and since the native winter steelhead in the South Santiam are declining, additional research is necessary before steelhead populations can be maintained in the Willamette River system. Out-migration timing of summer and winter steelhead smolts will be monitored by seining and electrofishing in the spring of 1976.

Kokanee Population Dynamics

The population dynamics of kokanee salmon was studied at Odell Lake from 1972 to 1975. The standing crop of kokanee salmon varied from 31 to 76 fish per acre with an estimated biomass of 5.4 to 7.3 kg (12 to 16 lb.) per acre.

Escapement of 7,000 to 14,000 adults produced an average of 2.2 million eggs. Egg survival from deposition to emergence was estimated between 26% and 46% providing year classes of approximately 500,000 to 1,700,000 fry. First-year fry survival was estimated at 2% to 3%. Year-class abundance appeared to be determined during the first year of life and was primarily a function of zooplankton density. Essentially all losses after the second year were attributed to angling mortality which was 30% for age 2+ and 71% to 75% for mature kokanee of age 3+ and older. Year-class production from 1972 to 1975 was below normal and was attributed to an apparent decline in lake productivity. Plans for nutrient budget research were initiated to assess the cause for the decline in lake productivity.

Deschutes Salmonid Studies

Rainbow trout were tagged in three study sections of the Deschutes River. The estimated number of rainbow trout 2 years of age and older in the Warm Springs (RM 97.0-92.0), North Junction (RM 72.5-67.5), and Nena Creek (RM 58.5-55.5) areas was 1,852, 2,451, and 1,500 fish per mile, respectively. Estimated number of rainbow trout per river mile in 1975 was not detectably different from estimates in previous years. Trout growth was slower in the Warm Springs area as compared to North Junction and Nena Creek areas.

An estimated 4,110 anglers spent 26,062 hours to catch 136 wild steelhead, 79 hatchery steelhead, 517 adult chinook, and 1,434 chinook jacks in the Sherars Falls area from July 16 to October 31, 1975. During the same period, Indian dip-net fishermen spent 3,361 hours to catch 346 wild steelhead, 552 hatchery steelhead, 1,632 adult chinook, and 1,725 chinook jacks. In the lower 69.2 km (43 miles) of the Deschutes River, an estimated 20,840 steelhead anglers spent 128,800 hours to catch 4,130 wild steelhead and 1,270 hatchery steelhead.

An evaluation of electrofishing gear was continued throughout the winter months. Approximately 25 experiments utilizing different types of direct current with a combination of pulse frequencies, duty cycles, and voltages were conducted. Unpulsed direct current seems to be the most promising capture technique for adult steelhead and chinook. Injuries ranged from 0% to 10% and the gear was effective in the main Deschutes River.

Streamflow Requirements of Salmonids

The study is designed to determine interrelationships between streamflow level and salmonid production.

Data collected at Elk Creek (Clatsop County) in 1975 have been used to develop a habitat rating system for coho salmon which explained 72% of the variation in coho biomass in six study sections at three different flow levels. If after further refinement this rating system is found to be valid, it has the potential of becoming an integral part of a technique which would estimate the carrying capacity of a stream section for coho salmon under a variety of flow conditions.

Research emphasis will be twofold:

1. To test the validity of the habitat rating system for coho and further refine the relationship between the rating system and coho biomass (carrying capacity).

2. To test the adaptability of the rating system to cutthroat trout.

Streamflow methodologies developed at Elk Creek will have limited application beyond Elk Creek unless tested on other streams with different characteristics in other parts of the state. Adapting the methodologies to salmonid species other than coho and cutthroat will be necessary in the future.

Effects of Copper on Migration ATPase Activity and Seawater Adaptation of Yearling Coho Salmon

The 96-h LC50 values for yearling coho salmon exposed to copper ($CuCl_2$) ranged from 75-60 ug/liter depending on degree of smolting. Tests were conducted at 10 C in water with alkalinity and hardness ranging from 68-78 and 89-99 mg/liter as $CaCO_3$, respectively.

Exposure of yearling coho to sublethal concentrations of copper (5 to 30 ug/liter) in fresh water (maximum of 172 days) had deleterious effects on downstream migration in a natural stream, lowered the gill ATPase activity, and reduced subsequent survival in seawater tests. Longer term exposures had more severe effects than did 144-h exposures on downstream migration and survival in seawater but not on gill ATPase activity. Fish immediately ceased feeding after initiation of exposure to 20 and 30 ug/liter Cu and should a loss of appetite for several weeks to 4 months. The mean lengths and mean condition factors of the groups receiving the higher copper concentrations were significantly lower than the controls at the end of the test. Exposure of yearling coho to copper (20 and 30 ug/liter) in fresh water affected their ability to maintain normal osmotic pressure and chloride concentrations in blood plasma. Similarly when these copper-intoxicated fish were transferred to seawater the plasma osmolality and chloride concentrations increased significantly compared with control fish.

Coho yearlings given a "rest" following exposure to toxicant showed higher survival when transferred to seawater than their counterparts which were transferred immediately.

Rogue Basin Evaluation Program

The purposes of the study are to determine the effect of Lost Creek Dam on the wild salmonid fishery of the Rogue River, to determine operational guidelines for the dam which will maximize projected fishery benefits, and to develop procedures for the operation of Cole Rivers Fish Hatchery to insure meeting mitigation goals.

Juvenile salmonids were captured at 31 stations throughout the Rogue Basin. They were subsampled for length, weight, and scale samples; and at selected stations they were marked by cold brand. The data collected were presented in one annual and four quarterly reports. Twenty specific kinds of analyses of the

juvenile data were identified as important to the evaluation of Lost Creek Dam. The data collected in 1974 and 1975 were evaluated to determine the sensitivity of each of the 20 analyses to detect significant changes in the life-history and biology of juvenile salmonids after completion of Lost Creek Dam.

Adult salmonids were captured by electrofishing, beach seining, and trapping in the upper and lower river. Thirty-three specific kinds of analyses of the adult data were identified as important to the evaluation of Lost Creek Dam. An analysis of the sensitivity of the adult salmonid data collected in 1974 and 1975 was completed.

Several kinds of historical fisheries data, extending in some cases back to 1880, were collected along with environmental, logging, gold mining, and irrigation data. This information was analyzed to determine optimal environmental conditions for the production of Rogue salmonids.

(Na+K)-stimulated ATPase was monitored in wild, hatchery, and laboratory-reared spring chinook. There was a relationship between the peak activity of ATPase and the time of entrance to sea of juvenile chinook. The relationship between ATPase and migration was not clearly defined. Laboratory studies showed that smolting in spring chinook was governed by size and photoperiod.

Elk River Fall Chinook Project

The purpose of this study is to obtain life-history information on south coast fall chinook salmon for use in developing rearing and release schedules at Elk River Hatchery. The information will be used to optimize survival and contribution to the fisheries of wild and hatchery fish. The long-term impact of the hatchery operation on wild fall chinook salmon will be determined and alternative plans for their management will be evaluated.

In 1975 data was gathered on the distribution, abundance, growth, and size at entrance into the ocean of juvenile salmon in Elk River. Temperature, turbidity, and flow regimes of the Elk River system were also monitored.

The number of adult fall chinook returning to Elk River during 1975 was estimated at 13,150 fish of which 9,610 were of hatchery origin and 3,540 were wild. A statistical creel census revealed an estimated 52,365 angler-hours of fishing effort were expended to harvest 3,600 fall chinook from Elk River during 1975. Of this number, 840 (23%) were caught during the extended sport fishing season in December. Sixty-six percent of the river sport catch was of hatchery origin. The ocean troll fishery harvested an additional 5.4 t (12,000 lb.) of chinook during the extended commercial season (November and December) off the mouths of the Elk and Chetco rivers.

Adult fish returning to the hatchery were examined for marks and tags and were sampled for selected biological information as

part of the ongoing concern for potential biological impacts of the hatchery program.

Distribution and density of naturally spawning fish exhibited no unusual patterns during the 1975-76 spawning season. However, production from early spawners may be greatly reduced as a result of a severe flood during mid-December.

Salmon River Project

This study is designed to optimize the contribution of fish produced at Salmon River Hatchery to Oregon's sport and commercial fisheries, minimize adverse impacts of hatchery fish on wild species, and develop management alternatives that complement the goals of the Cascade Head Scenic Research Area in which the Salmon River estuary is located.

Field studies were initiated in 1975 to determine the occurrence and basic life-histories of wild salmonids in the Salmon River watershed. Utilization of main stem and tributary streams by juvenile salmonids was monitored by seining in late spring and early summer. Estuarine seining showed a moderate use by juvenile chum salmon and yearling coho salmon in the spring and by juvenile chinook salmon from June through November.

Estuarine tagging of adult salmonids from August through January resulted in 89 chinook salmon, 15 coho salmon, and 7 steelhead trout being tagged with Petersen disk tags. These numbers were too low to permit accurate population estimates. Peak entrance time of adults was determined to be late August and September for chinook salmon and October through December for coho.

Coastal Fall Chinook Stock Assessment Project

The study is designed to determine if the offshore distribution of selected coastal fall chinook salmon stocks can be manipulated by altering release sites within a broad geographical range, thereby enhancing Oregon's coastal fisheries.

Fall chinook smolts implanted with coded-wire tags were released at Klaskanine Hatchery (to test Trask vs. Chetco stock), Alsea Salmon Hatchery (to test Trask vs. Elk stock), and in the Coos Bay estuary (to test Elk vs. Chetco stock). Appropriate controls of tagged smolts were released from each donor stock in their native rivers. Although plans called for about 38,000 tagged fish to be released in each group, the actual number liberated ranged from 23,616 to 39,150 due to poor tag retention among certain groups. Percentage tag retention ranged from 68% to 97% with an overall average of 85%. The total number of tagged fish released was 286,417.

Tenmile Lakes Project

Trend-through-time data on changes in the Tenmile Lakes populations of coho salmon and warm-water fish species have been obtained following chemical treatment of the lake. Additionally, annual estimates have been made of the coho salmon spawning escapement in tributaries to the lakes.

A trap was fished at a fixed site in South Tenmile Lake to provide an index of population changes since the lakes were treated with rotenone in 1968. In 1975 the trap was fished 2 weeks each month from July through December. The catch of juvenile coho salmon has declined from a high of 21.7 fish per net day in 1971 to a low of only 0.5 fish per net day in 1975. The largemouth bass catch per net day declined dramatically in 1975, down to 0.4 from 8.8 in 1974. The decrease in bass catch reflected the loss of age 2 and younger fish since these were the only age groups taken in the trap in previous years. The bluegill sunfish populations also continued to decline (46.3 fish per net day in 1975) after reaching a peak of 205.3 fish per net day in 1972.

An estimated 2,500 adult coho (age 3) and 3,500 coho jacks (age 2) spawned in the Tenmile Lakes system in 1975. The total return from the 1972 brood was 5,500 coho which was only about one-half the previous record low of 10,000 coho produced by the 1957 brood. Scale samples were collected from spawned-out coho to compare with scales taken from juveniles in previous years. Analyses of the scale samples may confirm current hypotheses on reasons for the collapse of the coho salmon population in recent years.

Tillamook Bay Project

An inventory of fish and shellfish and their related habitats is being conducted in Tillamook Bay to provide information for protecting these irreplaceable resources from human encroachment.

To date, 58 species of fish have been recorded in the bay. Fish and Dungeness crab sampled have been cataloged by area within the bay and by month recovered. Food habits of several species of fish have been examined. Other inventories include eel grass beds, clams, ghost shrimp, birds, and marine mammals.

Fall Chinook and Coho Salmon Enhancement in the Willamette River

The purpose of this project is to establish the maximum runs of fall chinook and coho salmon in suitable areas of the Willamette River system.

The return of 33,772 fall chinook adults to the Willamette River in 1975, nearly equaled the record return of 34,189 adults observed in 1974. However, in 1974 the percentage of returning

3- and 4-year-old fish was apptoximately 49% for both species. In the total 1975 return, only 16% of the observed fish were 3 years old while 82% were 4-year-old adults. Low, warm flows in 1973 caused delays in migration, aggravated problems with fish diseases, and required essentially all downstream migrants to pass through the industry generating plants at Willamette Falls. These problems contributed to the low return of 3-year-old fish in 1975. Work continued with Cowlitz River late spawning fall chinook and an estimated 400-500 adults returned to Row River in 1974 and over 1,000 in 1975.

The return of 6,000 coho adults to the Willamette River in 1975 was low. A return of 9,000 to 12,000 adults was expected from a release of 1.3 million 1972-brood smolts. Additionally, it was anticipated there would be a 1:1 return from the 10,000 adult coho which spawned above Willamette Falls in 1972. The low return may be partly related to a recent general decline in coho runs entering Pacific Coast rivers. However, it is also possible that the early spawning stock being worked with in the Willamette system is not the best suited stock for the available habitat.

Rearing Spring Chinook Salmon in Willamette Reservoirs

This study is designed to enhance production of adult spring chinook salmon in the Willamette River by rearing juveniles to smolt size in reservoirs.

In 1975 spring chinook fingerlings were released into Fall Creek Reservoir (1.1 million), Cottage Grove Reservoir (1.1 million), Green Peter Reservoir (1 million), and Walterville Pond (100,000). The estimated number of smolts migrating from Fall Creek and Cottage Grove reservoirs was 130,000 and 179,000 fish, respectively. Smolt migration from Green Peter Reservoir and Walterville Pond will not be completed until May 1976.

All juveniles released into Fall Creek and Cottage Grove reservoirs and Walterville Pond were started at Aumsville Ponds near Stayton. Pathological examination of these fish in the reservoirs during the summer and at migration showed heavy infections of Myxobolus insidiosus which may have substantially reduced in-reservoir survival.

A poor return to Cottage Grove Dam of 300 adult chinook was observed in 1975 from a migration of 400,000 juveniles in the fall of 1972. The adult return to Fall Creek Dam was 906 fish which is below the previous 5-year average of 1,660 fish.

A Comparison of Carson and Willamette Spring Chinook Stocks

This study is designed to determine the capability of the Carson Hatchery stock of spring chinook to increase production of salmon in the Willamette River.

In 1975, 200,000 juvenile fish each of Carson and Willamette stock spring chinook were reared at Willamette Hatchery. The Carson lot averaged 13.8 fish/lb. and the Willamette fish 12.4 fish/lb. when released below Fall Creek Dam in November. Carson fish spawn approximately 1 month earlier than the Willamette stock and consequently should have developed faster. However, the earlier spawning time for the Carson stock did not prove an advantage during the rearing period in the hatchery. Similar groups of Carson and Willamette stocks were released below Fall Creek Dam in November 1973. Only 4 Carson jacks and 0 Willamette jacks returned to Fall Creek in 1975 from this release.

Effects of Logging on the Environment of Salmonids: Laboratory Studies of Temperature

Constant temperature bioassays and critical thermal maximum determinations were conducted on 0-age cutthroat trout obtained from the Alsea Hatchery. Fish used for the tests were acclimated to 23 C constant and 13-25 C fluctuating temperature regimes. Fish exposed to a fluctuating temperature regime had a higher incipient lethal level and higher median survival times than constant temperature acclimated fish at all test temperatures.

Stress physiology studies were conducted on hatchery cutthroat trout exposed to constant and fluctuating temperatures.

Because temperatures in logged-over streams fluctuate dramatically after the loss of streamside vegetation and/or slash fires, new knowledge of temperature effects on resident species is needed. Current research is designed to provide basic knowledge of the effects of fluctuating temperatures on cutthroat trout.

An electronic thermometer sensing and recording system is being developed to assist in experimentation during the summer of 1976.

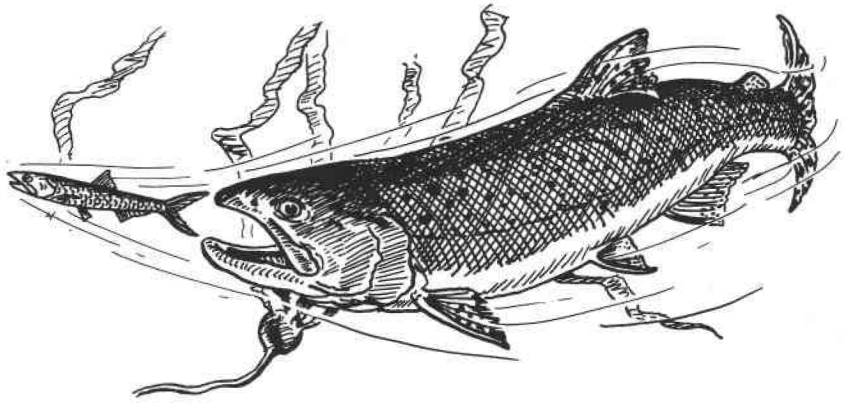
Wild and hatchery cutthroat trout will be acclimated to 23 C constant and 13-23 C fluctuating temperature regimes. Comparisons of median survival times for constant and fluctuating acclimated wild and hatchery cutthroat trout will be made. Constant and fluctuating lethal temperatures will be employed to determine median survival times. Critical thermal maximums will be determined for all groups at various stages of their acclimation.

Immunization Studies

Laboratory testing for oral *Vibrio* vaccine was completed in October 1975. Maximum protection was provided from feeding 5 milligrams of *Vibrio* vaccine per gram of diet for a period of 15 days. Feeding beyond 15 days did not significantly increase protection.

Field tests of feeding Vibrio vaccine were conducted on coho salmon at Fall Creek, Sandy, and Rock Creek hatcheries; spring chinook at Butte Falls Hatchery; fall chinook at Spring Creek Hatchery; summer steelhead at Bandon Hatchery; and winter steelhead at Alsea Hatchery.

Initial laboratory tests of spray immunization using adjuvants with trivalent vaccine (for controlling "fast" Vibrio, "slow" Vibrio, and furunculosis) were conducted. Spray immunization produced protection levels and blood titers in coho salmon comparable to vaccine injection. Oral treatment with Vibrio vaccine did not produce significant blood titers in any species tested.



ENVIRONMENTAL MANAGEMENT

Major effort was devoted to reviewing environmental statements, federal aid programs, and various state and federal permits for work which could impact fish wildlife habitat. Table 43 summarizes this effort:

Table 43. Environmental investigations in 1975.

Investigations	Number Received and Processed	Investigated
Fill/Removal Permits (DSL)	770	738
Corps of Engineers Permit (Sec. 10)	210	75
Mined Land Reclamation Permits	120	90
NPDES Waste Discharge Permits	371	119
OMB A-95 and Other Federal Notices	416	281
Environmental Statements	154	134
Highway Projects	44	40
Water Right Applications	1,420	671
Pesticide Use Programs	16	2
In-Water Blasting Permits	11	8
Total	3,532	2,158

Coordination continued with the Land Conservation and Development Commission, Oregon Coastal Conservation and Development Commission, and county land-use planning agencies to provide input for protection of fish and wildlife habitat.

Testimony concerning changes needed in water laws to better recognize in-stream flow values for fish was presented before the Senate Agricultural and Natural Resources Committee and the House Environmental and Energy Committee.

Support for the Elk Creek Dam segment of the Corps of Engineers' Rogue River Project was withdrawn on the basis of a potential reservoir turbidity problem. The Corps' temperature and turbidity report pointed out the need for adequate planning to avoid

complications of worsening watershed erosion and turbidity caused by timber harvesting, timber access road construction and maintenance, and similar activities in the fragile soil areas. Earlier action was reconsidered by the Commission and reversed to project support.

Phase I of the Columbia River Power Peaking study to inventory riparian habitat and associated wildlife is now completed. Next phase of this study is to determine the effects of river regulation for maximum power production on key riparian habitats and wildlife. Washington Department of Game has a contract to do the work.

New procedures for evaluating terrestrial and aquatic habitat and nonmonetary techniques for displaying effects of water development projects on fish and wildlife resources have been developed by the Fish and Wildlife Service. The procedures have been used on two water development projects by fish and wildlife resource agencies. To date, they have not been totally accepted by construction agencies.

The Coos Bay South Slough estuarine sanctuary proposal was accepted by the Coastal Zone Management Office in Washington, DC, Coos County, and the State of Oregon. Funding is being sought.

Communications were maintained with the Corps of Engineers, Soil Conservation Service, Bureau of Reclamation, and private entities to assure that new reservoir projects, bank revetments, stream channel modifications, and similar construction will have minimum impacts to fish and wildlife. Information was provided on 26 proposed water development projects.

Coordination of the fish passage operation on the Columbia and Snake rivers continued. A coordinator from the Environmental Management Section, acting under the auspices of the Columbia Basin Fishery Technical Committee, oversaw bimonthly inspections of upstream and downstream fish passage facilities at all main stem dams during the passage season. The inspectors consist of biologists and engineers from the federal and state fish and wildlife agencies of Idaho, Washington, and Oregon. Fish passage emergencies due to facility malfunctions, dam construction, and maintenance activities, and project operations were resolved.

Cooperation was continued with the Corps of Engineers, Bonneville Power Administration, Bureau of Reclamation, and Public Utility Districts to regulate flows and spilling and power operations at Columbia and Snake river dams to reduce injuries to upstream and downstream migrant anadromous fish. Steps were taken to reduce nitrogen supersaturation through control of spill, reduce power loading at specific projects, lessen turbine-caused mortality, and regulate spill to assist adult fish passage. Indications were that, for the 1975 season, adult and juvenile passage was significantly improved by these cooperative actions without a significant adverse impact on power production, irrigation, or flood control.

Actions were taken through the Columbia Basin Fishery Technical Committee (CBFTC) and the Corps of Engineers Fishery-Engineering Advisory Committee (FERTAC) to resolve anadromous fish problems on the Columbia River system. Efforts continued among fish and wildlife agencies and the Corps to complete the Lower Snake Compensation Plan for submission to Congress for authorization.

The multimillion dollar peaking studies funded by the Corps were carried out under the direction of FERTAC. Under this research and development program spillway deflectors and turbine screens are being installed to collect juvenile salmonids in the Snake River for transportation to below Bonneville Dam.

Recommendations for minimum streamflows for the Columbia and Snake rivers were developed by CBFTC and provided to the Corps and Bonneville Power Administration.

A petition was prepared by the CBFTC agencies which requested the Federal Power Commission to order Idaho Power Company to complete its anadromous fish compensation responsibility at Hells Canyon Project on the Middle Snake River.

Work was done to achieve fish passage at several small obstructions. Passage facilities were built, at our request under Oregon law, at Scotts Mill Dam on Butte Creek (Willamette basin), Stayton Dam (North Fork Santiam), and Clear Creek (Tualatin system).

LANDS

In 1975, 23 sites were acquired to benefit the statewide fishery program (Table 44).

Fifteen stream access sites were acquired as either bank angling or boat launching sites. Agreements that provided for angler access and to permit fishery management were obtained for five ponds and lakes. Easements were acquired for installations of fish ladders over impassable barriers at two sites. One hatchery site was acquired on Salmon River, and the Hood River Hatchery was sold.

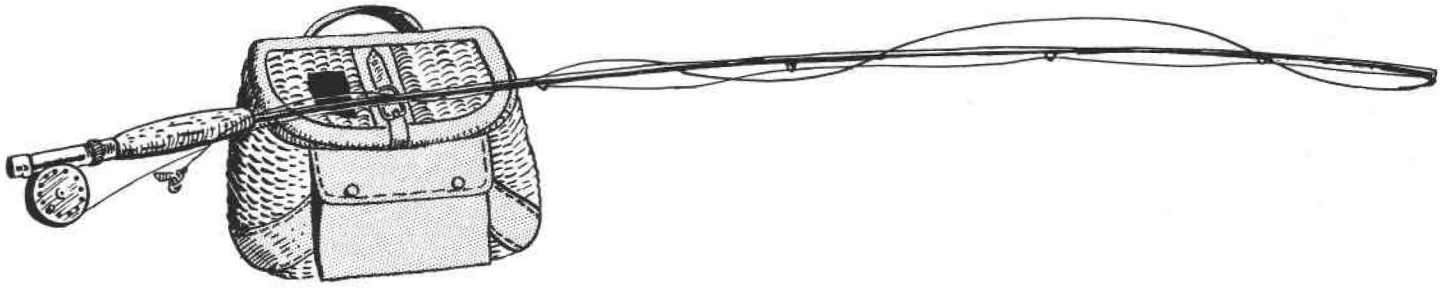


Table 44. Fishery related land acquisition, January 1, 1975, to December 31, 1975.

Region	Stream Access		Fish Mgt. Areas	Habitat Imp. Projects	Fish Culture
	Bank Angling	Boat Sites			
Northwest	McKenzie - Emerich site Big Creek - Boise Cascade Clackamas - River Island	Kilchis - Asphalt plant Wilson - Sollie Smith Br. Willamette, MF-Tripp Site	Withee Lake (Agreement) Willamina Pond (Agreement)	Eckman Cr. Falls (Ease.) Butte Cr. Dam Ladder (Ease.)	Salmon R. Hatchery
Southwest	Rogue - Trail Rogue - Long Branch Cr.	Rogue - Doughton Falls Rogue - Hayes Falls Rogue - Salmon Rock Rogue - Sardine Cr. SF Coquille - Stockpile	Whistler's Bend (Agreement)	--	--
Central	--	--	Vaughn Lake (Agreement)		Hood River Hatchery (sold)
Northeast	Grande Ronde - Waldrip Grande Ronde - Morris	--	Moe Pond (Agreement)	--	--
Southeast	--	--	--	--	--
Statewide Totals	7 sites	8 sites	5 sites	2 sites	1 site acq. 1 site sold

STATISTICAL SERVICES SECTION

The Statistical Services Section provides biometric services for the agency's resource managers, as well as supervising agency automatic data processing (ADP) activities. Services include sample survey design, statistical and mathematical analysis, computer systems development, and computer programming. The following fish resource activities are worth noting for 1975.

Oregon Fish and Wildlife Resource Data Base System

Maintained and operated by the Statistical Services Section, this computerized data management system provided summary tabulations of fish resources, habitat, and utilization data for individual waters, watersheds, counties, administrative regions, and for the entire state. It is an operational part of the Oregon Fish and Wildlife Plan.

1975 Statewide Angler Survey

A mail survey of 16,178 Oregon anglers was performed under contract by the OSU Survey Research Center. It provided estimates of 1975 Oregon angling pressure and total catch by area and by type of fish.

1975 Offshore Salmon Sports Fishery Survey

Designed and analyzed by the agency's Research Section with data collected by field biologists, this survey covered nine ports:

1. Mouth of the Columbia River
2. Garibaldi (Tillamook Bay)
3. Cape Kiwanda (Pacific City)
4. Depoe Bay
5. Yaquina Bay
6. Winchester Bay
7. Coos Bay
8. Gold Beach
9. Brookings

Recreational pressure and catch were estimated for the summer months, June through August. These ports and this time period represent nearly all the offshore salmon sports fishery for the Oregon coast.

Salmon-Steelhead Return Card Analysis

Approximately 22% of the 1974 salmon-steelhead tags issued were returned for analysis. Total statewide catch of salmon and steelhead was estimated from these as well as monthly catch by water. Correction for nonreturn bias is computed into these estimates. Daily Angler Licensees' voluntary reports were also analyzed but provided very little useful data.

Commercial Catch Statistics Data Processing

Fish landing tickets prepared by fish buyers were processed and tabulated. Fish poundages were summarized annually and by month for each buyer and each type of fish.

Special Field Sample Surveys

Field biologists obtained management information from several special surveys of individual sports fisheries. In 1975, the Statistical Services Section helped coordinate, design, and analyze the following special field sample surveys:

1. North Umpqua River trout and salmon (analysis of 1974 survey data).
2. Nehalem River winter steelhead (analysis of 1974-75 survey data and design of 1975-76 survey).
3. Thompson Valley Reservoir trout (design of 1975-76 survey).
4. Lemolo Reservoir and Diamond Lake trout (design of 1976 survey, analysis of 1975 survey data).
5. Williamson River trout (coordination of design and analysis, 1974 and 1975 surveys).
6. Lower Willamette River salmon (design and analysis).
7. Elk River salmon (design and analysis of 1974 and 1975 surveys).
8. Chetco salmon (design and analysis of 1974, 1975, and 1976 surveys).
9. Umpqua River striped bass (analysis of 1973 survey data).

Results of many of these surveys are given elsewhere in this report or are available as separate reports.

Other Biometry and Data Processing Projects

Analysis and data processing efforts by the Statistical Services Section included a variety of other projects:

1. Umpqua striped bass mark-recapture population estimation.
2. Analysis of 1974 Snake River recreational use survey data.
3. Dover and English sole mortality and exploitation analysis.
4. Mark-recapture population estimation, juvenile salmon in Willamette Valley reservoirs and rearing ponds.
5. Annual Pacific Coast salmon sampling and mark-recovery report.
6. Subtidal clam population studies, Tillamook and Yaquina bays.
7. Automation of creel census reporting.
8. Automated processing of fish mark data.

Results of several sports fisheries surveys and analyses are summarized in Table 45.

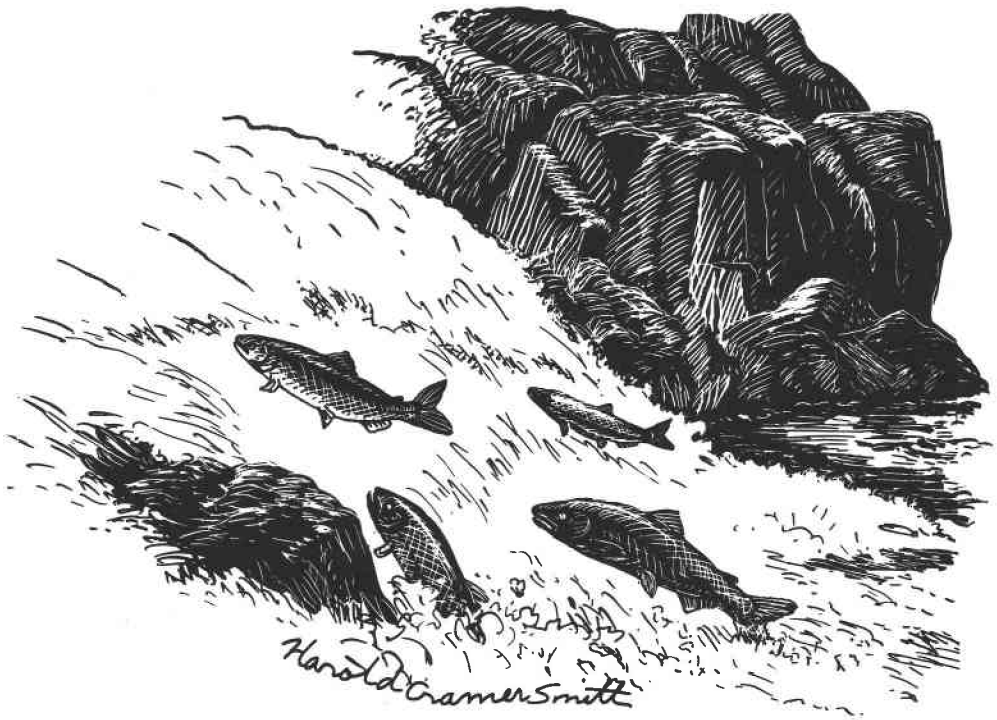


Table 45. Results of several completed surveys analyzed by the Statistical Services Section, 1975.

	Species	Estimates		
		Total Catch (Thousands)	Angler-Days (Thousands)	Catch per Angler-Day
1974 Salmon-Steelhead Return Cards	Chinook	528	--	--
	Steelhead	183	--	--
1975 Statewide Angler Survey	Trout	8,348	2,552	3.27
	Warm-water	3,154	416	7.58
	Salmon	471	847	0.56
	Steelhead	214	519	0.41
	Bay/Surf	597	123	4.86
	Other	56	74	0.76
	Total	12,840	4,531	2.83
1975 Offshore Salmon Sports Fishery	Coho	196	--	--
	Chinook	62	--	--
	Total	258	310	0.83
1973 Umpqua Striped Bass Fishery	Striped bass	3.3	22	0.15
1974 North Umpqua Sports Fishery	Trout	69	46	1.51
	Salmon	3.9	23	0.17
1974 Lower Willamette Salmon Sports Fishery	Salmon	12	143	0.08
1974 Chetco Salmon Sports Fishery	Chinook	2.8	14	0.19
1975 Chetco Sports Fishery	Chinook	3.1	--	--
	Steelhead	0.7		
	Total	3.7	15.1	0.25
1975 Williamson Trout Fishery	Rainbow	1.02	0.96	1.06

Table 46. Fishery resource expenditures, fiscal year July 1, 1974, to June 30, 1975.

Activity	Fund: State		Fund: Federal						
	General	Other	Dingell Johnson	Columbia River	Corps of Engineers	Anadromous Fish	Commercial R.& D. Act	Misc.	Total
Propagation:									
Fish Commission	663,512	28,462		757,422	301,326	46,543		3,764	1,801,029
Wildlife Commission		1,470,910		92,702	379,944	46,192		1,387	1,990,635
Subtotal	663,512	1,499,372		850,124	680,770	92,735		5,151	3,791,664
Habitat Improvement:									
Fish Commission	49,379			32,896				6,834	89,109
Wildlife Commission		189,114	29,622	83,231				60	302,027
Subtotal	49,379	189,114	29,622	116,127				6,894	391,136
Management and Research:									
Fish Commission	436,899	249,234		167,133	176,466	249,996		22,466	1,302,194
Wildlife Commission		1,153,636	263,095	45,957	271,380	101,880		54,431	1,890,379
Subtotal	436,899	1,402,870	263,095	213,090	447,846	351,876		76,897	3,192,573
Marine Fish Shellfish 1/	267,024	5,000					105,455	63,973	441,452
Administration:									
Fish Commission	658,232	307,330		35,272	54,250			5,631	1,060,715
Wildlife Commission		880,879							880,879
Subtotal	658,232	1,188,209		35,272	54,250			5,631	1,941,594
Capital Construction 1/	2,236,305				1,563,451			56,435	3,856,191
TOTAL	$4,311,351	$4,284,565	$292,717	$1,214,613	$2,746,317	$444,611	$105,455	$214,981	$13,614,610

1/ Fish Commission only

Table 47. Contributing personnel.

Name	Title	District or Section
Aney, Warren W.	Supervisor, Statistical Services	Statistical Services Section
Bauer, Jerry A.	District Biologist, Fish	Umpqua District
Bisbee, Larry E.	Staff Biologist, Warm-Water Fish	Fish Division
Campbell, Homer J.	Assistant Research Supervisor	Research Section
Christianson, Wernald H.	District Biologist, Fish	Upper Willamette District
Claire, Errol W.	District Biologist, Fish	John Day District
Cummings, Melvin S.	Lands Supervisor	Lands Section
Daily, Milton K.	Staff Biologist, Fish	Fish Division
Fisher, Gerald L.	Fiscal Manager	Fiscal Section
Fortune, John D.	District Biologist, Fish	Lincoln District
Golden, Michael P.	District Biologist, Fish	Bend District
Griggs, James D.	Staff Biologist, Resident Fish	Fish Division
Haight, William I.	District Biologist, Fish	Upper Rogue District
Haxton, John C.	District Biologist, Fish	Lower Columbia District
Heckeroth, David N.	District Biologist, Fish	Tillamook District
Herrig, Richard G.	District Biologist, Fish	Ochoco District
Hosford, William E.	District Biologist, Fish	Southeast District
Hutchison, James M.	District Biologist, Fish	Siuslaw District
Jensen, Christopher C.	Assistant Supervisor, Fish Culture	Fish Division
Knispel, Warren M.	District Biologist, Fish	Astoria District
Lichens, Allan B.	District Biologist, Fish	Columbia District
Massey, Julius B.	District Biologist, Fish	Lower Willamette District
Mastin, Henry E.	District Biologist, Fish	Lake County District
Phelps, James V.	District Biologist, Fish	Umatilla District
Pitney, William E.	Chief	Environmental Management Section
Pulford, Earl F.	Supervisor, Technical Services	Fish Division
Riikula, Arvo G.	District Biologist, Fish	Lower Rogue and South Coast District
Robinson, Jack G.	Assistant Marine Supervisor	Marine Region
Robinson, William L.	Biologist, Fish	Columbia River Management
Saltzman, William O.	Staff Biologist, Planning	Fish Division
Schwartz, Edward H.	District Biologist, Fish	Coos-Coquille District
Smith, Harold P.	Wildlife Artist	Information and Education Section
Stout, Wendell H.	District Biologist, Fish	Klamath District
Swan, Ralph L.	Staff Biologist, Habitat	Fish Division
West, Duane C.	District Biologist, Fish	La Grande District
Wetherbee, Julian J.	District Biologist, Fish	Middle Willamette District
Witty, Kenneth L.	District Biologist, Fish	Wallowa District