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MANAGEMENT OF THE TROLL SALMON FISHERY

ANNUAL and COMPLETION REPORT

July 1, 1976 to Sept. 30, 1977

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MANAGEMENT OF THE TROLL SALMON FISHERY

INTRODUCTION

The Troll Salmon Investigation is responsible for obtaining fishery and biological data, analyzing these data, and recommending appropriate management options for the troll fishery. Proposed management options are designed to achieve the optimum use of the salmon resource on a sustained basis.

Activities pursued during FY 1977 included the sampling and analysis of catch statistics, chinook age composition, mark recovery data, and coded wire tag data. We were also involved with the ocean sport sampling data processing. Short term work was conducted to study chinook maturity, to evaluate a troll season extension off southern Oregon, and to obtain salmon length frequency data.

THE 1976 TROLL SALMON SEASON

Regulations

The following changes were promulgated by the Pacific Fishery Management Council.
Chinook: Season opening changed from April 15 to May 1. The area north of Tillamook Head closed June 15-30. Barbless hooks required prior to July 1 north of Tillamook Head.

Coho: Season opening changed from June 15 to July 1 north of Tillamook Head. Minimum size changed from 15 inches to 16 inches in all areas.

The 1976 chinook troll season opened on May 1 and continued through October 31st with two exceptions. The first exception was the June 15-30 closure north of Tillamook Head. The second exception was the one month extension off the Elk and Chetco Rivers. The 1976 coho season opened on June 15th south of Tillamook Head and July 1st north of Tillamook Head. The coho season closed on October 31st, with the exception of the one month extension off the Elk and Chetco Rivers.

Extended Troll Season

The Department of Fish and Wildlife extended the troll season through November, 1976 in two areas off the southern Oregon coast. The purpose of the extension was to reduce the numbers of surplus hatchery chinook anticipated at the Elk and Chetco River stations. The extended fishery was restricted to the following areas:

Elk River Area: Cape Blanco south to Humbug Mountain and offshore to three miles.

Chetco River Area: Goat Island south to the California-Oregon border and offshore to three miles..

Catch Statistics

Final 1976 Oregon troll fishery landings are summarized in Tables 1 and 2 for chinook and coho respectively. The number of individual Oregon salmon landings made during 1976 was tabulated as a measure of fishing effort (Table 3). Landings

Table 1. Oregon Troll Chinook Catch Statistics for 1976 by Area and Month

Category and Month	Columbia River	Newport	Coos Bay	Brookings	Total
<u>No. of Lbs Round</u>					
May	165,619	7,594	17,403	1,382	191,998
June	123,900	67,159	181,257	27,746	400,062
July	46,492	163,733	322,271	48,016	580,512
August	31,465	182,045	411,439	25,729	650,678
September	16,436	17,937	186,268	38,309	258,950
October	3,221	18,745	31,409	49,375	102,750
November			14,351	10,512	24,863
Total	387,133	457,213	1,164,398	201,069	2,209,813
<u>No. of Fish</u>					
May	14,306	582	1,422	95	16,405
June	11,152	4,901	15,395	2,364	33,812
July	5,084	11,070	26,146	4,471	46,771
August	2,667	12,920	35,857	2,413	53,857
September	1,160	1,289	17,133	3,605	23,187
October	261	1,729	3,016	3,453	8,459
November			1,096	758	1,854
Total	34,630	32,491	100,065	17,159	184,345

Table 2. Oregon Troll Coho Catch Statistics for 1976 by Area and Month

Category and Month	Columbia River	Newport	Coos Bay	Brookings	Total
<u>No. of Lbs Round</u>					
June	518,733	658,564	1,056,886	28,536	2,262,719
July	625,347	1,439,932	2,721,621	244,460	5,031,360
August	318,113	1,291,994	1,101,744	31,098	2,742,949
September	138,682	140,681	53,336	5,302	338,001
October	14,196	26,000	3,191	1,857	45,244
November			29	35	64
Total	1,615,071	3,557,171	4,936,807	311,288	10,420,337
<u>No. of Fish</u>					
June	112,733	144,795	214,515	4,775	476,818
July	131,267	254,017	460,088	38,153	883,525
August	46,041	192,687	165,767	4,475	408,970
September	22,411	20,089	8,092	714	51,306
October	1,866	3,806	447	222	6,341
November			4	4	8
Total	314,318	615,394	848,913	48,343	1,826,968

from May 1 to June 15 were exclusively chinook. Columbia River area includes Astoria, Warrenton and Tillamook. Newport area includes Pacific City, Depoe Bay and Newport. Coos Bay area includes Florence, Winchester Bay, Coos Bay, Bandon, Port Orford and Gold Beach.

Table 3. Number of Individual Salmon Landings in Oregon for 1976 by Area and Month

Month	Columbia	Newport	Coos Bay	Brookings	Total
May	398	161	372	8	939
June	1,522	5,263	5,690	620	13,095
July	2,289	10,194	12,203	1,841	26,527
August	2,212	10,779	10,181	1,155	24,327
September	1,049	2,455	3,494	377	7,375
October	178	952	449	1,375	2,954
November	0	0	253	347	600
Total	7,648	29,804	32,642	5,723	75,817

Troll chinook landings were 2,210,000 pounds round weight in 1976, down 26% from the 2,970,000 pounds round landed in 1975 (Figure 1). The 1976 landings were 320,000 pounds (17%) above the 1966-75 average. Total chinook landings were excellent during May and June. Newport area landings were excellent during July and August. Coos Bay area landings were good during May and June but only fair the rest of the year. Brookings was only fair the entire season.

The 1976 troll coho landings were 10,420,000 pounds round compared to 4,701,000 pounds landed in 1975 (Figure 1). The 1976 landings were 3,880,000 (59%) above the 1966-75 average. Coho landings were excellent the entire season in the Columbia River, Newport and Brookings areas. Coos Bay area landings were excellent from June through August.

1976 Troll Chinook Age Composition

Chinook landings were sampled at several ports to obtain age composition information. Scales were taken from 2,863 chinook. Plastic impressions were prepared from these scales and ages were determined. Age composition estimates were applied to the total landings.

As in most years, fish in their third year of life were dominant (Figure 2). In 1976, third-year fish represented 64% and fourth-year fish 33% of the total catch. The 1966-75 average was 65% for third-year fish and 31% for fourth-year fish.

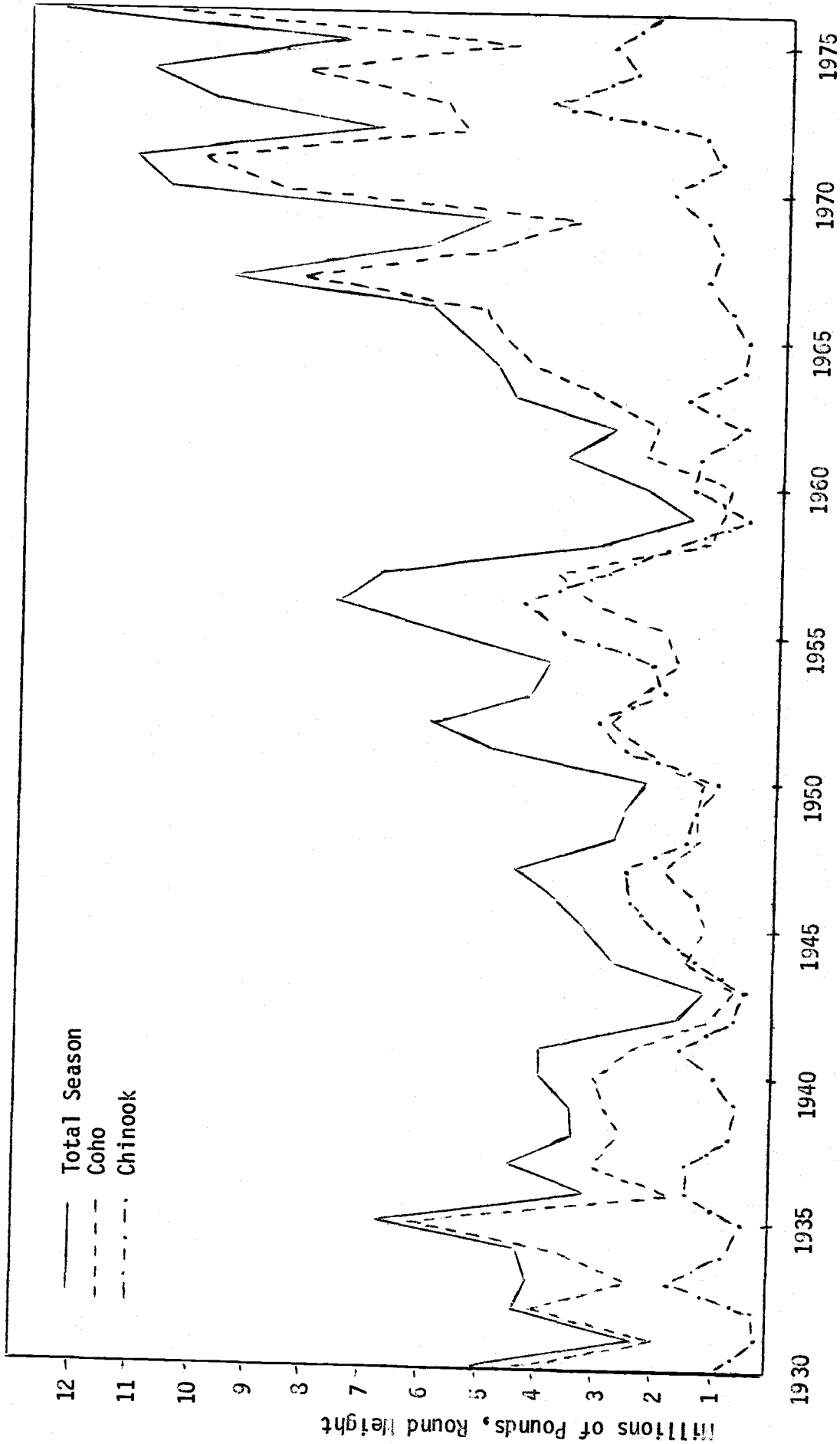


Figure 1. Oregon Ocean Troll Salmon Production, 1930-1976

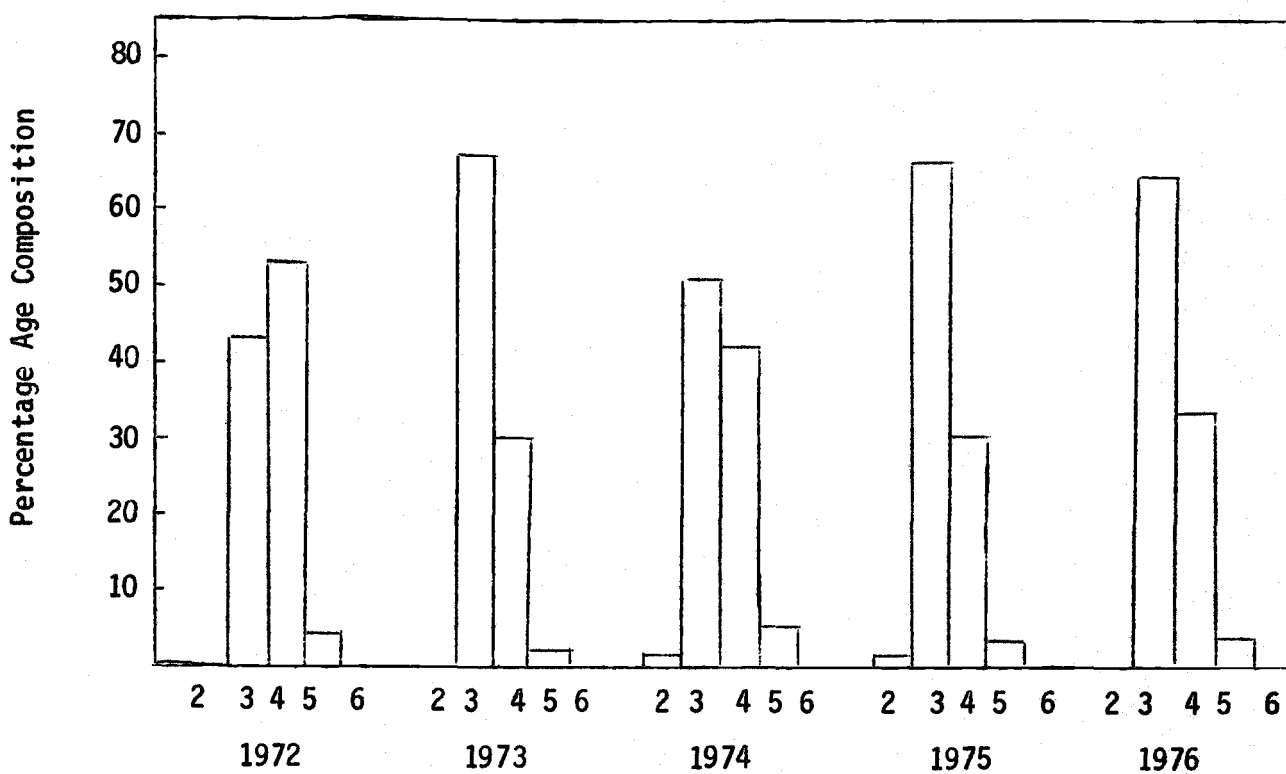
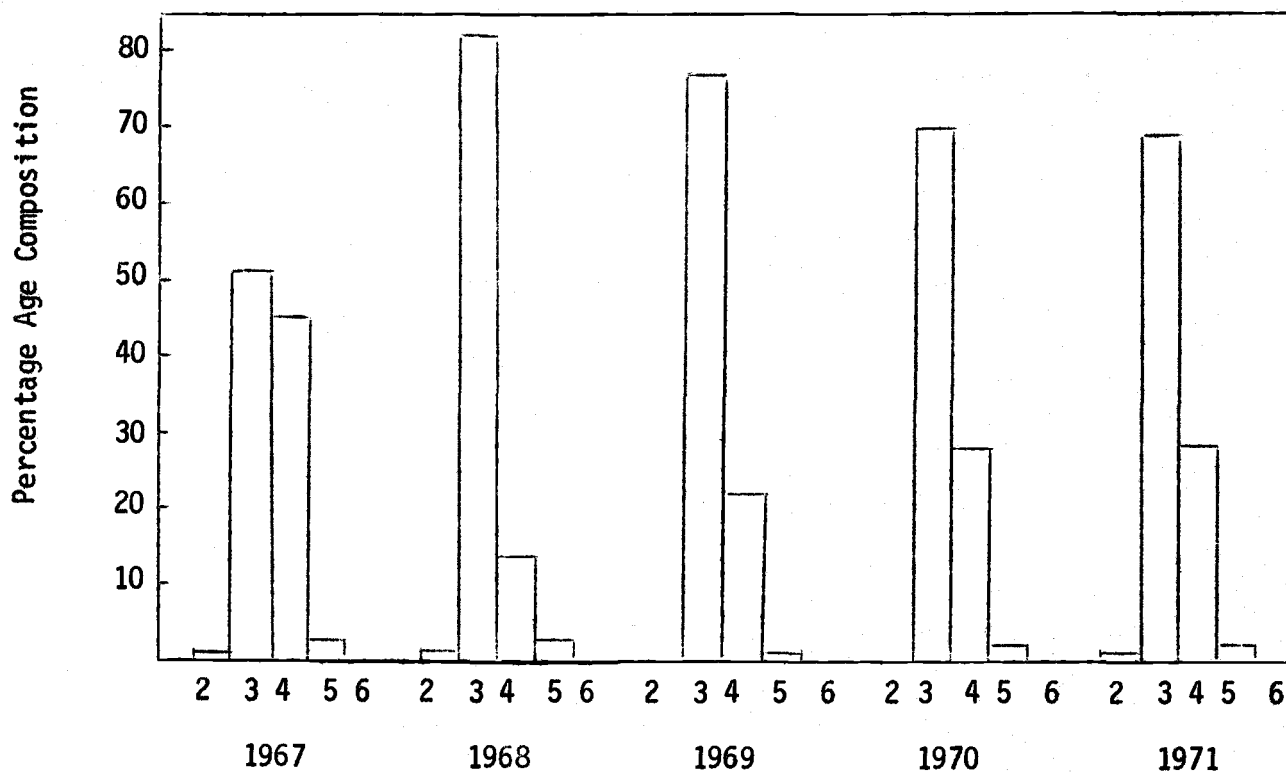


Figure 2. Age Composition by Year of Life for Chinook in the Oregon Troll Fishery, 1967-76

Troll Salmon Mark Sampling

Two samplers each were assigned to both Astoria and Charleston. Newport and Brookings were assigned one sampler each. This sampling effort resulted in 20% of all chinook and 15% of all coho being examined for marks and coded wire tags. Detailed sampling information is presented in Tables 4 and 5 for chinook and coho respectively.

Samplers observed 1,549 fin-clipped chinook in the landings (Table 6). Most of the marks were either duplicated or unassignable. Approximately 17% of the total mark recoveries were from the Rogue River and 9% were from the Umpqua River.

We collected 285 chinook heads for coded wire tag recovery. Technicians found tags in 213 or 75% of these heads. The main contributing agencies were ODFW with 37% and USFWS with 35% of the total.

Samplers found 4,629 marked coho in the troll fishery (Table 7). Most of the marks were either duplicated or unassignable. The use of coded wire tags has drastically reduced the number of assignable fin marks used on coho.

We collected 2,757 coho heads for coded wire tag recovery. Technicians found tags in 2,024 or 73% of these heads. The main contributing agencies were ODFW with 61% and WDF with 34% of the total.

Average Weight Data

Average weight data were collected from chinook and coho salmon for conversion of landings in pounds to numbers of fish. The 1976 chinook average weights are presented in Table 8. The seasonal average weight for chinook was 10.4 pounds dressed weight compared to 11.5 pounds in 1975. Chinook average weights in all areas were down from their respective 1975 averages. Chinook average weights seldom reflect growth with time because age and stock composition in a given area continually fluctuate.

Coho average weights usually show a monthly increase from June through the end of the season. This was not true in 1976 with the exception of Brookings (Table 9). Groups of small maturing 3-year-old fish moved through the fishing areas and caused unusual fluctuations in the average weights. The seasonal average weight was 5.0 pounds dressed compared to 6.2 pounds in 1975. Average weights in all areas were below the 1975 figures.

Chinook landings during the extended season were 24,863 pounds round weight or an estimated 1,943 fish. Coho landings during this period were 64 pounds round weight or an estimated 8 fish.

An anticipated benefit of the extended season was the high incidence of mature Elk and Chetco River chinook observed in the catch. Lack of funds precluded sampling at Brookings during this extended season but Coastal Rivers staff furnished necessary help to sample Port Orford landings. Most of the marked fish recoveries were actual or probable Elk River chinook (Table 6). Seventy percent of the Port Orford sample were Elk River fish. Mark recovery data suggest that the catch at

Table 4. Oregon Troll Chinook Mark Sampling, 1976

Landing Area	May	June	July	Aug.	Sept.	Oct.	Nov-Dec.	Total
<u>Columbia River</u>								
No. Examined	8,002	3,043	420	179	265	0	0	11,909
No. Landed	14,306	11,152	5,084	2,667	1,160	261	0	39,630
% Examined	56	27	8	7	23	0	-	34
<u>Newport</u>								
No. Examined	3	488	591	994	119	19	0	2,214
No. Landed	582	4,901	11,070	12,920	1,289	1,729	0	32,491
% Examined	.5	10	5	8	9	1	-	7
<u>Coos Bay</u>								
No. Examined	6	2,695	3,323	5,153	3,513	738	258	15,686
No. Landed	1,422	15,395	26,146	35,857	17,133	3,016	1,096	100,056
% Examined	.4	18	13	14	21	24	24	16
<u>Brookings</u>								
No. Examined	0	1,585	2,380	1,437	1,170	1,258	0	7,830
No. Landed	95	2,364	4,471	2,413	3,605	3,453	758	17,159
% Examined	0	67	53	80	32	36	0	46
<u>Total</u>								
No. Examined	8,011	7,811	6,714	7,763	5,067	2,015	258	37,639
No. Landed	16,405	33,812	46,771	53,857	23,187	8,459	1,854	184,345
% Examined	49	23	14	14	22	24	14	20

Table 5. Oregon Troll Coho Mark Sampling, 1976

Landing Area	June	July	August	Sept.	Oct-Nov.	Total
<u>Columbia River</u>						
No. Examined	38,448	28,854	6,050	3,763	0	77,115
No. Landed	112,733	131,267	46,041	22,411	1,866	314,318
% Examined	34	22	13	18	0	25
<u>Newport</u>						
No. Examined	19,518	22,208	18,604	2,263	169	62,762
No. Landed	144,795	254,017	192,687	20,089	3,806	615,394
% Examined	13	9	10	11	4	10
<u>Coos Bay</u>						
No. Examined	42,098	47,415	27,095	2,679	262	119,567
No. Landed	214,515	460,088	165,767	8,092	451	848,913
% Examined	20	10	16	33	58	14
<u>Brookings</u>						
No. Examined	2,906	17,130	2,881	296	46	23,259
No. Landed	4,775	38,153	4,475	714	226	48,343
% Examined	61	45	64	41	20	48
<u>Total</u>						
No. Examined	102,970	115,607	54,630	9,019	479	282,703
No. Landed	476,818	883,525	408,970	51,306	6,349	1,826,968
% Examined	22	13	13	18	8	15

Table 6. Summary of Chinook Marks Recovered from the Oregon Troll Fishery, 1976

Origin	Marks	Brood	May			June			July			August			September			October			Nov		Total
			CR	CB		CR	N	CB	B	CR	N	CB	B	CR	N	CB	B	CR	N	CB	B	PO	
Abernathy Cr.	D-Ad	1972																				1	
Elk R. Hatch.	D-Ad-RP	1972																				25	
Not Assigned	D-Ad-RP	1973																				1	
Not Assigned	D-Ad-RP	Unk.																				2	
Abernathy Cr.	D-LV	1972																				1	
Elk R. Hatch.	D-LP	1971																				3	
Chetco River	D-RP	1971																				7	
McKenzie R.	D-RP	1972																				1	
Duplicated	Ad	1971																				1	
Duplicated	Ad	1972	5																			72	
Duplicated	Ad	1972	23																			7	
Duplicated	Ad	1973	100																			312	
Duplicated	Ad	1974																				2	
Duplicated	Ad	Unk.	1																			6	
Spring Cr. Hatch.	Ad-LV	1972																				5	
Coos Bay	Ad-LV	1973																				41	
N. Umpqua River	Ad-LV-RV	1971																				2	
Alsea River	Ad-LV-RV	1972																				4	
N. Umpqua River	Ad-LV-RV	1973																				60	
Not Assigned	Ad-LV-RV-RM	1973																				3	
Alsea River	Ad-LV-RP	1972																				1	
N. Umpqua River	Ad-LV-LM	1972																				24	
Not Assigned	Ad-LV-LM	1973																				1	
Kalama Falls Hatch.	Ad-RV	1972																				1	
Coos Bay	Ad-RV	1973																				1	
Alsea River	Ad-RV-LP	1972																				2	
Not Assigned	Ad-RV-RM	1972																				1	
Not Assigned	Ad-RV-RM	1973																				1	
Row River	Ad-LP	1973																				2	
Not Assigned	Ad-LP-RP	Unk.																				1	
Not Assigned	Ad-LP-LM	1972																				2	
Row River	Ad-RP	1972																				1	
Not Assigned	Ad-RP	1973																				58	
Not Assigned	Ad-RP-LM	1973																				4	
Not Assigned	Ad-RP-LM	1972																				1	
Not Assigned	Ad-LM	1973																				2	
Not Assigned	Ad-RM	1972																				3	
Not Assigned	Ad-RM	1973																				3	

Table 6. Continued

Origin	Marks	Brood	May			June			July			August			September			October			Nov		Total
			CR	CB	B	CR	N	CB	B	CR	N	CB	B	CR	N	CB	B	CR	N	CB	PO	PO	
Duplicated	LV	1971																				27	
Duplicated	LV	1972																				14	
Duplicated	LV	1973																				6	
Duplicated	LV	1974																				53	
Duplicated	LV	Unk.																				194	
N. Umpqua R.	LV-RV	1972																				2	
McKenzie R.	LV-RV	1973																				7	
Not Assigned	LV-RV	Unk.																				7	
Not Assigned	LV-RV-LM	1972																				20	
N. Umpqua R.	LV-RV-LM	1973																				18	
Not Assigned	LV-RV-LM-RM	1973																				4	
Not Assigned	LV-RV-RM	1972																				2	
Not Assigned	LV-RV-RM	1973																				2	
Feather River Hatch.	LV-LP	1973																				34	
Coquille River	LV-RP	1972																				1	
Not Assigned	LV-RP	Unk.																				1	
Rogue River	LV-LM	1972																				1	
Deschutes River	LV-LM	1973																				4	
Not Assigned	LV-LM-RM	1972																				6	
Not Assigned	LV-LM-RM	1973																				1	
S. Santiam River	LV-RM	1972																				47	
Rogue River	LV-RM	1973																				6	
Not Assigned	LV-RM	Unk.																				1	
Duplicated	RV	1971																				4	
Duplicated	RV	1972																				1	
Duplicated	RV	1973																				25	
Duplicated	RV	1974																				11	
Duplicated	RV	Unk.																				125	
Coos River	RV-LP	1972																				1	
Coos Bay	RV-LM	1973																				4	
Not Assigned	RV-RM	1973																				1	
Duplicated	LP	1971																				3	
Duplicated	LP	1972																				7	
Floras Lake	LP	1973																				4	
Duplicated	LP	Unk.																				45	
																						8	
																						5	

Table 6. Continued

Origin	Marks	Brood	May			June			July			August			September			October			Nov		Total			
			CR	CB		CR	N	CB	B	CR	N	CB	B	CR	N	CB	B	CR	N	CB	P0	B				
Willamette River Duplicated Elk River Duplicated Duplicated Not Assigned	LP-LM	1972									1													1		
	RP	1971																						1		
	RP	1972			1																			15		
	RP	1973					1				1													8		
	RP	Unk.																						1		
	RP-LM	1972																						1		
Willamette River S. Santiam River	RP-RM	1972																						1		
	RP-RM	1973																						1		
Totals			138	3	45	11	67	31	9	15	145	55	6	41	232	36	6	2	261	71	1	76	89	37	172	1,549

CR = Columbia River
N = Newport
CB = Coos Bay
P0 = Port Orford
B = Brookings

Table 7. Summary of Coho Marks Recovered from the Oregon Troll Fishery, 1976

Origin	Marks	Brood	June			July			August			September			Oct.		Total
			CR	N	CB	B	CR	N	CB	B	CR	N	CB	B	N	CB	
Not Assigned	D	1973			1							1					2
Crystal Lake (Alaska)	D-Ad	1973															1
Duplicated	Ad	1973	388	180	403	37	1	322	240	573	127				3	1	3,081
Duplicated	Ad	1974					1	1	1			2					7
Seward Lagoon	Ad-LV	1973					1	1	1				1				4
Not Assigned	Ad-LV-RP	1973															1
Umpqua River	Ad-LV-LM	1973															2
Bear Cr. (Alaska)	Ad-RV	1973			2		1	3						1			6
Not Assigned	Ad-RV-LM	1973															1
Not Assigned	Ad-LP	1973	2		1		2	1	5								21
Not Assigned	Ad-RP	1973	4		5		2	1	10		3						28
Not Assigned	Ad-LM	1973			2												4
Not Assigned	Ad-RM	1973			3			2									6
Duplicated	LV	1973	2	11	78	15		32	77	63							399
Not Assigned	LV-RV	1973	1			1		3	3	2							14
Tualatin River	LV-LP	1973			3	3			8	7							30
Tualatin River	LV-RP	1973			1	5		2	11	3							23
Umpqua River	LV-LM	1973			1	4		1	8	8							31
Not Assigned	LV-RM	1973			5	67	21	44	74	73							14
Duplicated	RV	1973															375
Not Assigned	RV-LP	1973						1	6	4							1
Umpqua River	RV-LM	1973			2	1		2									21
Not Assigned	RV-RM	1973							3	2							4
Abernathy Cr.	LP	1973	4	12	40	13		7	19	63	27						259
Not Assigned	LP-RP	1973			1	2			4	3							13
Not Assigned	LP-LM	1973					2										2
Not Assigned	LP-RM	1973							1	1							3
Not Assigned	RP	1973	2	10	56	11		6	16	81	35						272
Duplicated	RP	1974															1
Not Assigned	RP-LM	1973							1								1
Not Assigned	RP-LM-RM	1973															1
Not Assigned	RP-RM	1973															1
Totals			403	221	674	105		343	367	942	357	86	302	569	84	48	4,629

CR = Columbia River
 N = Newport
 CB = Coos Bay
 B = Brookings

Table 8. Observed Average Dressed Weight and Calculated Numbers of Troll Chinook by Month and Area, 1976

	May	June	July	Aug.	Sept.	Oct.	Nov.	Total
<u>Columbia River</u>								
Number	14,306	11,152	5,084	2,667	1,160	261	0	34,630
Pounds	144,016	107,739	40,428	27,361	14,292	2,801	0	336,637
Ave. Wt.	10.1	9.7	8.0	10.3	12.3	10.7	0	9.7
<u>Newport</u>								
Number	582	4,901	11,070	12,920	1,289	1,729		32,491
Pounds	6,603	58,399	142,376	158,301	15,597	16,300		397,576
Ave. Wt.	11.3	11.9	12.9	12.3	12.1	9.4		12.2
<u>Coos Bay</u>								
Number	1,422	15,395	26,146	35,857	17,133	3,016	1,096	100,065
Pounds	15,134	157,615	280,236	357,774	161,971	27,312	12,479	1,012,521
Ave. Wt.	10.6	10.2	10.7	10.0	9.5	9.1	11.4	10.1
<u>Brookings</u>								
Number	95	2,364	4,471	2,413	3,605	3,453	758	17,159
Pounds	1,202	24,127	41,753	22,373	33,312	42,935	9,141	174,843
Ave. Wt.	12.7	10.2	9.3	9.3	9.2	12.4	12.1	10.2
<u>Total</u>								
Number	16,405	33,812	46,771	53,857	23,187	8,459	1,854	184,345
Pounds	166,955	347,880	504,793	565,809	225,172	89,348	21,620	1,921,577
Ave. Wt.	10.2	10.3	10.8	10.5	9.7	10.6	11.7	10.4

Table 9. Observed Average Dressed Weight and Calculated Numbers of Troll Coho by Month and Area, 1976

	June	July	Aug.	Sept.	Oct.	Nov.	Total
<u>Columbia River</u>							
Number	112,733	131,267	46,041	22,411	1,866		314,318
Pounds	451,072	543,780	276,621	120,593	12,344		1,404,410
Ave. Wt.	4.0	4.1	6.0	5.4	6.6		4.5
<u>Newport</u>							
Number	144,795	254,017	192,687	20,089	3,806		615,394
Pounds	572,664	1,252,115	1,123,473	122,331	22,609		3,093,192
Ave. Wt.	4.0	4.9	5.8	6.1	5.9		5.0
<u>Coos Bay</u>							
Number	214,515	460,088	165,767	8,092	447	4	848,913
Pounds	919,030	2,366,628	958,038	46,380	2,775	25	4,292,876
Ave. Wt.	4.3	5.1	5.8	5.7	6.2	6.2	5.1
<u>Brookings</u>							
Number	4,775	38,153	4,475	714	222	4	48,343
Pounds	24,814	212,574	27,042	4,610	1,615	30	270,685
Ave. Wt.	5.2	5.6	6.0	6.5	7.3	7.5	5.6
<u>Total</u>							
Number	476,818	883,525	408,970	51,306	6,341	8	1,826,968
Pounds	1,967,580	4,375,097	2,385,174	293,914	39,343	55	9,061,163
Ave. Wt.	4.1	5.0	5.8	5.7	6.2	6.9	5.0

Port Orford originated almost entirely in the Elk River.

Sixty-nine percent of the chinook landed were fish in their fourth year of life or older. During the regular troll season (May 1-October 31) over 64% of the chinook sampled were fish in their third year of life (Figure 2). This suggests that the proportion of mature chinook in the troll landings was highest during the extended season.

The extended season reduced the return of chinook to both the Elk and Chetco Rivers. It is important to note that the sport fishery also took substantial numbers of large chinook. Adequate numbers of chinook entered Elk River but low water conditions blocked access to the hatchery. As a result of this the needs of the hatchery program were not met.

CHINOOK MATURITY STUDY

A study was conducted in the spring of 1977 to determine the maturity schedule of chinook salmon taken in the troll fishery along the southern Oregon coast. With the possibility of minimum size changes coming up, we were looking closely at the fish in the 26-28 inch range.

REPORTS

The following reports and papers were completed by the staff during the 1977 fiscal year.

McQueen, Robert K. 1976. Oregon troll salmon status report for the Pacific Marine Fisheries Commission annual meeting.

Reed, Paul H., Robert K. McQueen and Malcolm H. Zirges. 1976. Management of the troll salmon fishery. Annual and Completion Report. Oregon Department of Fish and Wildlife. 15 p.