

TROLL SALMON INVESTIGATION PROGRESS REPORT

APRIL - OCTOBER 1956

Recovery of Marked Salmon by the Oregon Troll Fishery in 1956.

Introduction

Following the precedent of previous years, biologists stationed at key Oregon ports sampled a large percentage of the ocean troll salmon catch for fish with clipped fins. The actual recovery of these marked fish by the Oregon fishery during the 1956 season is summarized in this report. Oregon marks recovered by fisheries in other areas, and the calculated numbers of Oregon marked salmon taken by the Pacific Coast fishery will be discussed in later reports. A large number of single fin clips were also observed, but are not included in this report.

Mr. Ronald C. Naab did the majority of the sampling for the Astoria area, which included fish landed at Astoria, Warrenton, and Ilwaco, plus the many which were trucked from coastal ports for processing by Astoria canneries. These coastal fish were included with their respective ports of landing, although the exact area of catch was unknown. Mr. Gale R. Finley sampled the commercial and sport fisheries at Newport and Depoe Bay. Messrs. Alfred R. Morgan and Raymond N. Breuser cooperated in checking the landings in the Coos Bay area whenever time permitted, but the large majority of fish from that area were sampled when they arrived in Astoria for processing.

Scales from the marked chinook were read once (by RCN) and assigned to their proper experiment by brood year. Whenever there was any doubt as to the correct age, the scales were read again (by JVH and RCN) and a decision reached. The marked silvers were assumed to be of the 1953 brood except those of extremely small size whose scales were read. Very few 1954 brood silvers were found in this year's marks.

Silver Salmon

To convert the landing statistics, which are given in pounds, into actual numbers of fish, average-weight data were computed. Table 1 gives the average dressed weight of the silvers by port and month. The 1956 averages are far under the previous five-year average and this year's average of 6.11 pounds is the lowest ever recorded.

Undoubtedly several factors contributed to the extremely small individual size of the 1956 silver salmon crop. Partial explanation is the large catch of silvers during the months of June and July when they are of small size, which would lower the yearly average. In previous years most of the silvers were taken during July, August, and September, and were of a larger size. Also to be considered was the large numbers of two-year-old jack silvers which appeared off the Columbia River during the last months of the season. Many landings were nearly all jack silvers with the percentage becoming so high that local canneries paid reduced prices for the smaller fish.

Fishing pressure lessened considerably from the last of August to the middle of September when many of the trollers went jigging for albacore tuna. Since the tuna were quite a distance offshore, only the larger boats were capable of the long trips required, and the less-efficient small boats and day trollers landed the bulk of the salmon. Frequent storms in the last weeks of October practically eliminated the fishing during the latter part of the season.

The numbers of silvers examined by their respective port of landing and month are shown in Table 2. It was estimated that 95 per cent of the silvers landed and examined for marks at the Columbia River ports were actually caught in the area extending from Willapa Bay to Cape Lookout, 3 per cent were caught in the Coos Bay area, and 2 per cent in the Newport area. Well over 90 per cent of the silvers landed at the coastal ports were caught in the general

area of the port with an area of overlap at Heceta Head. The Heceta area is considered the dividing line between the Newport and Coos Bay areas and is fished extensively by the fleets from both areas.

A summary of the silver salmon mark recoveries by marking experiment, month, and port of landing is presented in Table 3. The marks recovered from our random samples of the commercial catch are shown in the face of the table and will be the only ones used in calculating the theoretical total numbers of marked silvers taken by the entire fishery. The non-random or selected marks are those found or saved by fishermen, cannery butchers, and fish receivers, and are included only for information.

Although over 11,000 more silver salmon were examined this year than last, the number of marks recovered was considerably less (203 compared to 542). Again this year the Oregon Game Commission coastal rivers marks made up the bulk of the total recoveries. This both-ventral mark comprised 51 per cent of this year's total actual recovery.

A record high of 20 Puget-Sound-marked silvers were recovered during the first months of the 1956 season, apparently partially justifying the long-held belief that there is a sizable contribution by Washington silvers to the early Oregon fishery. Big Creek marked fish appeared frequently throughout the year. These silvers had been graded into two size groups and distinctively marked prior to release. Five of the large size group and 44 of the small size group were recovered with some evidence that the fish maintained their size difference. The large fish averaged 67.7 cm. in length and weighed 6.9 pounds while the small group averaged 65.0 cm. and 6.0 pounds.

The Nehalem fingerling planting experiment produced some interesting results. An equal number of silver yearlings were distinctively marked with one group being released into fresh water and the other being released into

Table 1. Average Dressed Weight of Troll-Caught
Silver Salmon in 1956.

Port	June	July	August	September	October	Total
Columbia						
Number	613	7,137	4,776	515	277	13,318
Weight	2,417	40,899	31,426	3,599	1,986	80,287
Average	3.94	5.73	6.58	6.91	7.17	6.03
Newport						
Number	3,121	14,574	12,287	480		30,462
Weight	14,209	86,896	82,456	3,401		186,962
Average	4.55	5.96	6.71	7.08		6.14
Coos Bay						
Number	204	397	379	8	8	996
Weight	1,102	2,395	2,684	52	55	6,288
Average	5.40	6.03	7.08	6.50	6.88	6.31
Total						
Number	3,938	22,108	17,442	1,003	285	44,776
Weight	17,728	130,190	116,566	7,012	2,041	273,537
Average	4.50	5.89	6.68	6.99	7.16	6.11

Table 2. Numbers of Troll-Caught Silver Salmon Examined for Marks in 1956.

Port	June	July	August	September	October	Total
Columbia	2,091	21,820	7,090	2,708	893	34,602
Newport	4,843	24,129	12,387	797	0	42,156
Coos Bay	5,154	14,063	1,883	8	8	21,116
Total	12,088	60,012	21,360	3,513	901	97,874

Table 3. Summary of Silver Salmon Marks Recovered From the Oregon Troll Fishery in 1956.

Origin River System — Stream	Mark	Brood Year	June			July			August			September			October			Non Random	Total
			Columbia	Newport	Coos Bay	Columbia	Newport	Coos Bay	Columbia	Newport	Coos Bay	Columbia	Newport	Coos Bay	Columbia	Newport	Coos Bay		
Washington Puget Sound																			
Bush Point	Ad-LV	1953		1		1	1	1										2	6
Minter Creek	Ad-An	1953				3	1	1										1	6
Skykomish	Ad-BV	1953	1	4		1	5	5	2									2	20
Columbia River																			
Big Creek	An-RV	1953				1		3				1							5
Big Creek	An-LV	1953		1	3	9	7	10	3	4	1	3			1			2	44
Oregon Coast																			
Nehalem	D-RV	1953		1	1	4	2	3	2	1	1	1							16
Nehalem	D-LV	1953			1													2	3
Oregon Coast	BV	1953		1	4	7	16	26	13	20	3	2	5		1			3	101
Oregon Coast	BV	1954								1			1						2
Total			1	8	9	26	32	49	20	26	5	7	6		2				
Grand Total				18		107		51		19		2		12				203	

tidewater. Sixteen of the fresh water plant were recovered while only 3 of tidewater plant were found.

Chinook Salmon

The same general procedure used for silvers was followed. Table 4 shows the average dressed weight, Table 5 of the numbers examined, and Table 6 the summary of marks recovered.

Southern Oregon enjoyed a very successful year, while the Columbia River area was very poor with the exception of the spring run. Preliminary figures indicate a record troll chinook year for the Coos Bay area. Particularly outstanding was the abundance and large individual size of the catch off the Cape Blanco area during the last of June and first of July. The Heceta Head area continued to be a leading chinook area producing large fish and high catches throughout July and August. The intense sport fishery off the Columbia from July through September caused a decline both in numbers taken and individual size of the commercial catch by virtually eliminating trolling near the mouth due to the high concentration of sport boats. This will be further discussed in a following section dealing with the 1956 ocean sport fishery.

Well over 90 per cent of the fish landed and examined for marks at the various ports were caught in the general area of the respective port. A very small amount of overlap once again occurred in the Heceta Head area. The Columbia River fishery during April was limited entirely to the area extending from the Columbia River to Willapa Bay.

The numbers of chinook examined during the 1956 season were far lower than the previous year but the types and percentages of marks recovered were quite similar. The Umpqua marks once again made up the greatest percentage of the total recoveries. California marks appeared in small numbers throughout the early and middle portions of the season.

Table 4. Average Dressed Weight of Troll-Caught
Chinook Salmon in 1956.

Port	April	May	June	July	August	Sept.	Oct.	Total
Columbia								
Number	4,772	3	84	1,795	1,416	64	53	8,187
Weight	51,862	25	688	20,860	16,054	515	421	90,425
Average	10.87	8.33	8.19	11.62	11.34	8.05	7.94	11.04
Newport								
Number			3,651	7,964	8,370	276		20,261
Weight			52,161	101,360	92,693	2,764		248,978
Average			14.29	12.73	11.07	10.01		12.29
Goos Bay								
Number	47	118	173	81	756	30	6	1,211
Weight	466	1,722	2,030	963	7,670	245	53	13,149
Average	9.91	14.59	11.73	11.89	10.14	8.17	8.83	10.86
Total								
Number	4,819	121	3,908	9,840	10,542	370	59	29,659
Weight	52,328	1,747	54,879	123,183	116,417	3,524	474	352,552
Average	10.86	14.44	14.04	12.52	11.04	9.52	8.03	11.89

Table 5. Numbers of Troll-Caught Chinook Salmon
Examined for Marks in 1956.

Port	April	May	June	July	August	Sept.	Oct.	Total
Columbia	7,272	23	166	2,729	1,654	195	112	12,151
Newport	0	633	5,592	9,037	8,372	692	0	24,326
Coos Bay	47	2,435	4,926	2,999	3,061	30	6	13,504
Total	7,319	3,091	10,684	14,765	13,087	917	118	49,981

Table 6. Summary of Chinook Salmon Marks Recovered From the Oregon Troll Fishery in 1956.

Origin River System -- Stream	Mark	Brood Year	April	May	June		July			August			Sept.	Non Random	Total
			Columbia	Cocs Bay	Newport	Cocs Bay	Columbia	Newport	Cocs Bay	Columbia	Newport	Cocs Bay	Newport		
Columbia River															
Spring Creek (FWS)	An-RV	1953	1							1	1			2	5
Bonneville	Ad-BV	1952	1		1										2
Oregon Coast															
Umpqua	BV	1951		1											1
Umpqua	BV	1952	2	1	1			2	1		2			2	11
Umpqua	BV	1953			1	1	1	4		2	7	10	1	4	31
Umpqua	RV-RM	1951		1											1
Umpqua	RV-RM	1952		3	1	1		1	2		1	1			10
Umpqua	RV-RM	1953				1	1	6		9	2	7		3	29
Rogue	BV-IM	1953										1			1
Rogue	IM-Ad	1953										1	1		2
California															
Sacramento	D-Ad	1951	1									2			3
Klamath	Ad-RV	1951			1										1
Total					5	3	2	13	3	12	16	20			
Grand Total			5	6	8		18			48	1		11	97	

Recovery of Tags From the 1955 Troll Tagging

During the 1955 commercial trolling season, Mr. Edwin L. Niska accompanied various trollers on a sampling-at-sea study and tagged some of the "shakers" or sub-legal chinook. In general, only the fish in good condition were tagged, and the others were sampled for sex, maturity, and age. Totals of 41 Petersen disc tags and 92 plastic spaghetti tags (borrowed from the California Department of Fish and Game) were placed on chinook and 2 Petersen tags and 1 spaghetti tag were used on silvers. All the tagging was done in the Columbia River area extending from Willapa Bay to Cape Falcon. In all, 13 chinook tags were reported (4 in 1955 and 9 in 1956) for a 9.8 per cent recovery, with 3 being Petersen tags (7.3 per cent recovery) and 10 being spaghetti tags (10.9 per cent recovery). None of the tagged silvers were recovered. Still more recoveries are expected next year, as many or most of the fish tagged were two years old.

Sport gear accounted for 62 per cent of the total recoveries (8 of the 13) with 2 of the remainder taken by troll gear, 1 by purse seine, and 2 by gill net or dip net. A northerly migration was shown by 6 of the tagged fish which were taken north of the original tagging area, 2 as far as the west coast of Vancouver Island. The Columbia River produced 5 tag recoveries with the remaining 2 recovered south of the tagging area, 1 as far as the Alsea River.

Mr. Henry O. Wendler of the Washington Department of Fisheries reported another tag from the lower Columbia River sport fishery, but no further information was available. This was a white spaghetti tag, but the sportsman would not permit the biologist to examine the fish or the tag. It may have been from another experiment, such as the North Pacific Fisheries Commission tagging program or last winter's Columbia River tagging.

Table 7 shows the information regarding the individual tag recoveries up to the present time.

Table 7. Recoveries of Tags from the 1955 Chinook Troll Tagging.

Tag Number	Date Tagged	Area Tagged	Total Length	Date Caught	Area Caught	Gear
Spaghetti						
B-6154	4-21-55	Willapa Bay	23 in.	7-28-56	Westport	Sport
B-6156	4-22-55	Willapa Bay	15 in.	9-1-56	Columbia River	Sport
B-6173	7-28-55	Cape Falcon	17 in.	9-7-55	Alsea River	Sport
B-6175	8-1-55	Tillamook Rock	16 in.	9-22-55	Lewis River	Sport
B-6177	9-12-55	Tillamook Rock	23 in.	2-21-56	Westport	Sport
B-6199	8-5-55	Col. Lightship	18 in.	8-25-55	Celilo Falls	Dip Net
B-6218	9-17-55	Col. Lightship	18 in.	10-12-55	Columbia River	Gill Net
B-6240	9-22-55	Col. Lightship	20 in.	8-12-56	Westport	Sport
B-6241	9-22-55	Col. Lightship	19 in.	8-27-56	40-mile Bank	Troll
B-6250	9-22-55	Col. Lightship	24 in.	9-2-56	Columbia River	Sport
Petersen						
R 2406-07	4-18-55	Willapa Bay	24 in.	6-23-56	Westport	Sport
R 2444-45	9-23-55	Col. Lightship	22 in.	7-30-56	off Columbia R.	Troll
R 2476-77	9-23-56	Col. Lightship	22 in.	7-31-56	Vancouver Island	Purse Seine

Observations on the Ocean Sport Fishery in 1956.

Throughout the summer, attempts were made to sample the Newport-Depoe Bay and Columbia River ocean sport fisheries to determine the intensity, relative success, size, age, and maturity of the catch. The sport season in the Newport-Depoe Bay area was quite successful for silver salmon but rather mediocre for chinook. Elimination of the Astoria salmon derby during 1956 apparently had little or no effect in lowering the intensity of the Columbia River sport fishery. The immediate area of the river mouth was often literally dotted with sport boats of nearly every conceivable size and description throughout August. Success ran very high for both silvers and chinook with limit catches being common and over-limit catches far from the exception. Although no figures are now available, indications show a fairly successful season for the southern Oregon coast in the Coos and Winchester Bays area.

Fishing intensity continually increased from June through the first of September. Coast Guard figures show an increase from about 12 sport boats on July 14 to about 200 on August 6. The greatest increase occurred during the previous "derby" period of August 25 through Labor Day weekend. The vast majority of the sampling was done prior to this period, while all the Oregon Game Commission and Washington Department of Fisheries sampling was done from August 25 to September 3. Columbia anglers caught an average of 0.9 chinook and 1.0 silvers per day with each boat averaging 3.9 chinook and 3.7 silvers for each day of fishing. Most of the boats checked were fairly large charter boats accommodating several or more anglers each. Very few outboard skiffs attempted the long trip from Astoria and Warrenton to the Columbia bar.

Newport and Depoe Bay sportsmen had a much lower daily average on chinook of 0.1 per angler and 0.4 per boat, but the average silver catch of 0.9 per angler and 3.9 was very similar. However, the chinook from the Newport area were of a much larger overall size than those from the Columbia.

The Newport fish averaged a dressed weight of 14.2 pounds and a total length 32.4 inches compared to 7.8 pounds and 26.7 inches for the Columbia. Silver salmon taken from the two areas were very similar with the Newport-Depoe Bay silvers averaging a dressed weight of 6.5 pounds and a total length of 26.7 inches, while the Columbia averages were 6.7 pounds and 27.4 inches.

Figures 1 and 2 show the length frequencies, ages, and maturities of sport-caught chinook salmon from the Columbia River and Newport-Depoe Bay areas. Fish Commission length, age, and maturity samples on 65 chinook were used as a stratified sub-sample and integrated into the total numbers measured by the Fish Commission (112) and the Washington Department of Fisheries (239) to produce Figure 1. Figure 2 shows only the numbers examined by our biologist at Newport and Depoe Bay.

Examination showed 61 per cent of the chinook salmon taken in the Columbia River area were under the commercial troll minimum size limit of 26 inches and 52 per cent were "feeders" or immature fish not on their spawning migration. All of the chinook in the age groups $^03+$, $^13+$, and $^04+$ were mature, but 64.3 per cent of the $^01+$ group and 55.6 per cent of the $^02+$ group were immature. A very pronounced variance dependent upon maturity was apparent in the overall size. Immature chinook of the $^02+$ age group averaged over 6 pounds and nearly 6 inches smaller in dressed weight and total length than the mature fish, being 5.4 pounds and 25.3 inches compared to 11.6 pounds and 31.0 inches. This is further evidenced in the $^01+$ group with the immature fish averaging 3.0 pounds dressed weight and 21.1 inches total length while the mature fish averaged 3.9 pounds and 21.6 inches. In direct contrast nearly all of the chinook examined at Newport and Depoe Bay were over 26 inches in length and were mature.

Figure 1. Length-Frequency, Age, and Maturity of Sport-Caught Chinook Salmon, Columbia River Area, July-September 1956

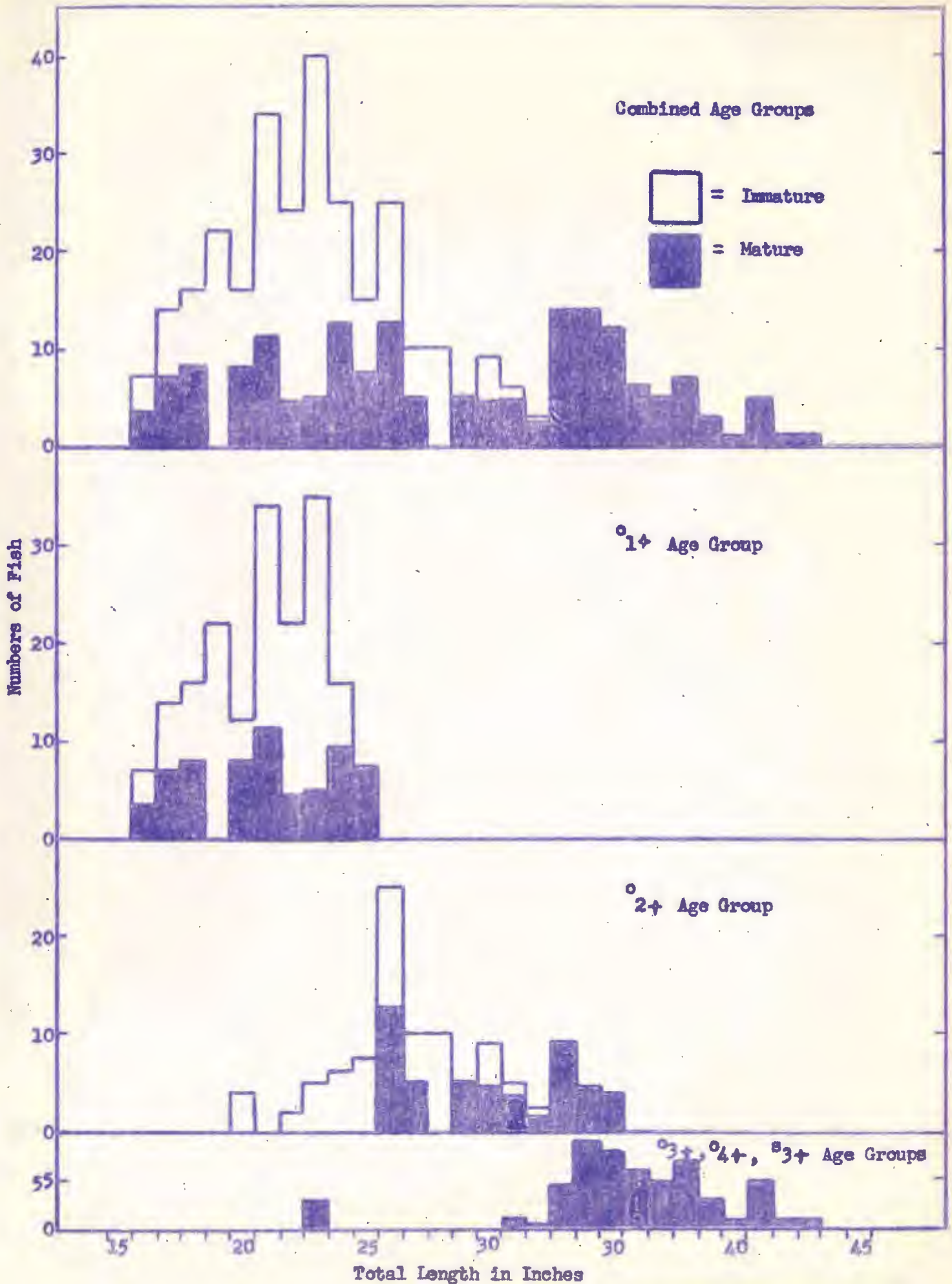
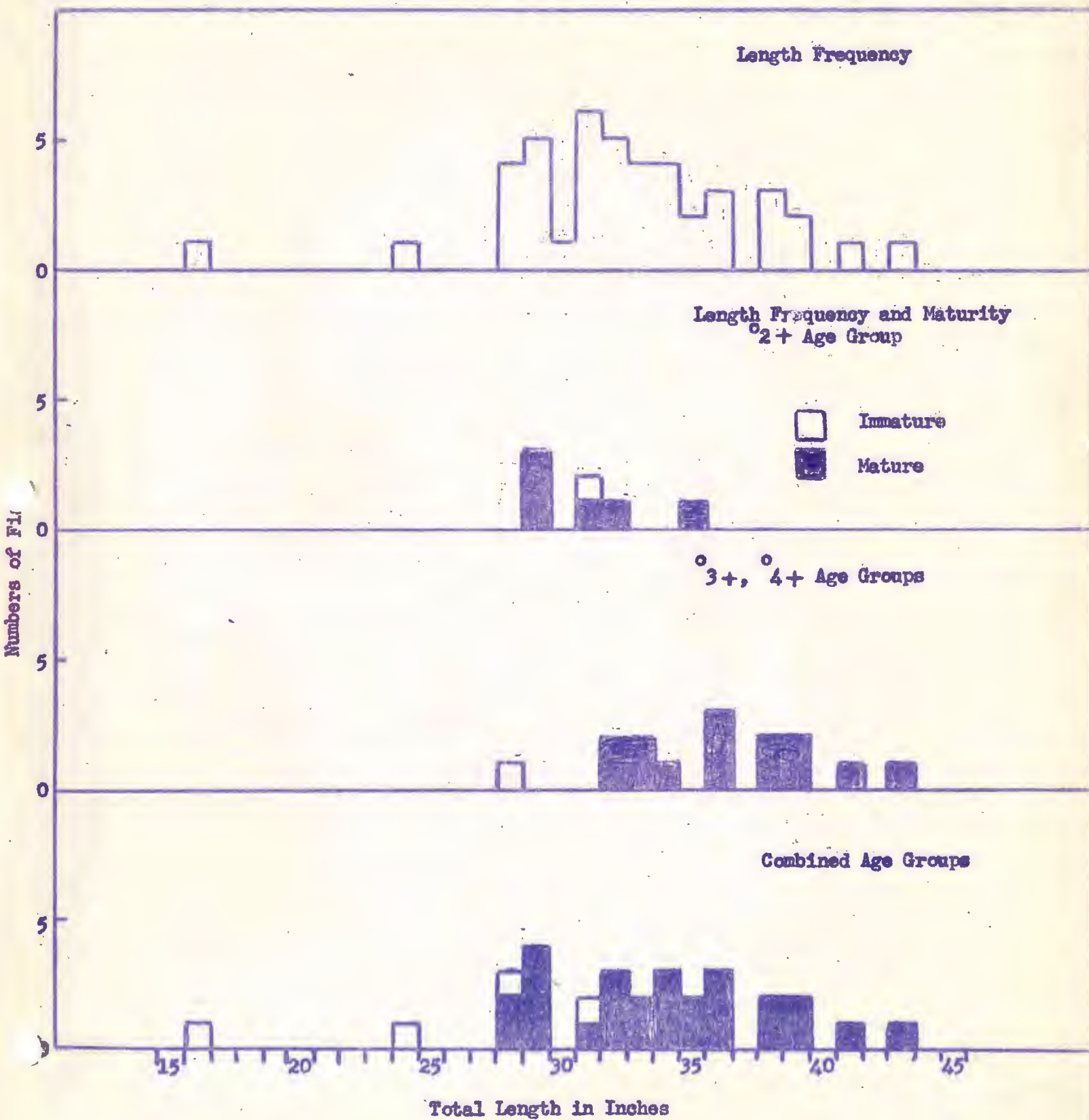


Figure 2. Length-Frequency, Age, and Maturity of Sport-Caught Chinook Salmon, Newport-Depoe Bay Area, June-September 1956.



The run of jack silver salmon which appeared off the Columbia River about the middle of September was virtually untouched by the sport fishery. Labor Day weekend is essentially the climax of the sport season and the fishing pressure is reduced sharply immediately following this period. This late unharvested jack run combined with the high percentage of small immature fish taken during July and August causes considerable skepticism regarding the desirability of the existing Columbia River special jack salmon season. In effect this regulation allows the taking of 4 additional salmon provided they are between 12 and 24 inches in length based on the assumption these "extra" fish will be jacks. Present indications seem to contradict this assumption and show that 71 per cent of the chinook within this size range are immature feeders and not mature jacks.

An interesting possibility presents itself here--that of calculating the age composition of the Columbia River fall chinook run. Assuming that the sport gear is non-selective, the sport catch of mature fish in and off the mouth of the Columbia River in August should give a reasonable approximation of the age composition of the run as it enters the river and before it is affected by the gill-net fishery. Taking the sport catch of mature fish, the $^{\circ}1+$ age group comprised 38 per cent of the run, the $^{\circ}2+$ group 28 per cent, and the $^{\circ}3+$, $^{\circ}3+$, and $^{\circ}4+$ groups combined 34 per cent. Removing the $^{\circ}4+$ year class fish from the last category leaves the third and fourth year groups almost equal in numbers and the two-year jacks predominating in the run. This throws some doubt on the commonly used assumption that the fall chinook is on a predominately four-year cycle.

The following shows the numbers of fish examined by Fish Commission biologists, area caught, and the marks found:

Area Caught	Chinook		Silvers	
	Number Examined	Marks	Number Examined	Marks
Columbia River	186	1 Ad-RV	178	
Newport— Depoe Bay	50	4 BV	432	2 BV
TOTAL	236	3 BV 53 Br. Umpqua 1 BV 52 Br. Umpqua 1 Ad-RV 54 Br. Klickitat	610	2 BV 53 Br. Oregon Coastal Streams

Messrs. Ralph Swan of the Oregon Game Commission and Henry O. Wendler of the Washington State Department of Fisheries offered the following regarding the 1956 Columbia River sport catch for the period August 25 to September 3:

Species	Number Examined	Brood	Mark	Number	Origin
Chinook	4,256	1954	Ad-DV	4	Klickitat
		1954	Ad-RV	1	Klickitat
		1954	An-LP	3	Wind River
		1954	An-RP	2	Wind River
Silvers	5,024	1953	An-Ad	1	Minter Creek
		1953	An-RP	1	Tillamook
		1953	BV	1	Oregon Coast

There appears to be a good survival of 1954 brood Columbia River fall chinook marks, as the sampler at Westport, Washington, also reported many of the Klickitat marks showing up there.

A number of single fin clips were also observed, but are not included above. The numbers and types of marks found by the Game Commission samplers at Coos and Winchester Bays are not known at the present time.

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