THE IMPORTANCE OF THE OCEAN SPORT FISHERY TO THE OCEAN CATCH OF SALMON IN THE STATES OF WASHINGTON, OREGON AND CALIFORNIA[1]

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INTRODUCTION

Commercial fishing for salmon in the ocean began in the late 19th and early 20th centuries when it was found that both chinook *(Oncorhynchus tshawytscha)* and silver salmon *(O. kisutch)* would readily take a trolled lure (Van Hyning, 1951). Scofield (1956) noted that commercial trolling through the 1890's amounted to little until the discovery of the mild-curing process (about 1898) following which it reached quantity production about 1901. Kauffman (1951) stated that Washington inside commercial trollers gradually turned to more productive grounds offshore after 1917. These offshore trollers were exceedingly important to the economy of many small coastal ports and were instrumental in opening new small boat harbors along the coasts of Washington, Oregon, and California.

Commercial trolling licenses have shown a general increase after World War II and especially during the last few years. Part of the increase has been due to the ease in obtaining licenses in some of the states, regardless of type of boat or gear. Both commercial and sport trolling may be conducted readily from small boats which require a low original investment. The gear used is comparatively inexpensive. This manner of fishing, therefore, has attracted many hundreds of commercial and sport fishermen to waters adjacent to the coasts of the three aforementioned states.

Sport fishing for salmon in Washington's sounds, bays, harbors, and rivers also dates back to the late 19th century (Pressey, 1953). However, it was not until the early 1940's that this salt-water sport began showing signs of becoming one of the more important fisheries of this state. Scofield *(op. cit.)* mentioned that salmon trolling was practiced in California in the early 1880's by a few sportsmen. The real increase began after World War II. Prior to 1951, except for the Puget Sound region, salt water sport catches generally occurred either in or just off the various coastal river mouths during the period when runs of salmon were expected to enter the rivers on their annual spawning migration.

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Prior to 1950, relatively few sportsmen had fished for salmon in the ocean. The few pioneers in these areas were generally local people using small low-powered open boats who fished the "safe" tides and then scurried to shore with their catches. The horsepower race which so radically changed the automotive field after World War II also affected manufacturers of small boat motors. The use of glass, metal, and plastics has revolutionized the boat building industry. The combination of dependable and powerful motors with larger, more seaworthy small craft has permitted the sportsman to travel to offshore fishing areas that would have been unsafe only a few years ago. These small craft have tended to outnumber the commercial boats and have invaded coastal waters that formerly had been fished exclusively by the commercial troller.

The question often arises in almost any discussion with commercial or sport fishing interests as to the importance of these two fisheries to the total ocean catch of salmon. The primary difficulty in reaching adequate conclusions has been a lack of the manpower needed to make satisfactory surveys of sport fisheries. The commercial salmon catch for the three western states is obtained relatively easily since the poundage of all fish sold must be listed on receipt sheets, copies of which are sent to the managing agency. The number of fish in the catch can then be determined by applying average weight factors collected in the field.

The estimation of the catch by sportsmen has always been fraught with difficulties. Each year the fishery may change either in area fished, duration of the fishery, or type of lure used. The program of sampling may be limited in scope because of manpower shortages. These factors, singly or in combination, may cause sampling errors which in turn may induce the catch estimate to be too large or too small. However, each of the states involved with ocean sport fisheries has developed certain methods to enumerate the catch.

In the sport fisheries two types of boats predominate: the skiff or outboard kicker boat, and the party or charter boat. The party boats usually have better angler success because of their greater cruising range and experienced professional skippers. They also carry considerably more people than the smaller limited-range outboards.

METHODS OF ESTIMATING CATCH BY SPORTSMEN

Washington

Washington does not issue a sport fishing license for the taking of salmon. The basic statistic used to estimate the sport catch depends on the area fished and the coverage desired. In and off the mouth of the Columbia River boat counts taken by the Coast Guard are used in conjunction with personal interviews as the boats bring their catches to the landing areas. This particular sampling program is conducted jointly with the State of Oregon since the Columbia River is the state boundary line. In the more northern coastal areas charter boat log books, Coast Guard boat counts, and personal interviews are utilized. In the extreme northern sector (Neah Bay), boathouse report forms are used in conjunction with interviews. Through the use of these methods, sampling intensity has been as high as 30 percent of the boats fishing in the area (Columbia River Progress Report, August-December 1956).

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Oregon

Oregon requires a sport fishing license for salmon and steelhead and utilizes the punch card-interview system coupled with Coast Guard counts of boats in the areas of fishing to enumerate the catch. This method has been successful in certain areas where the fishery is not spread over great distances and a single species predominates in the catch. The Oregon punch card does not differentiate between species of salmon. Prior to 1959, it was not required to note on the punch card the number of fish caught if the catch occurred in international waters. This necessitated interview sampling which may have been sparse because of limited manpower. By legislative act in 1959, a landing importation law was enacted which requires that salmon caught in international waters be noted on the punch card when the fishermen enter the state waters.

California

California also requires a sport fishing license. In this state party boat skippers are required to send a daily log of their passengers' catches to the Department of Fish and Game. Spot checks are made of the accuracy of these reports. In 1955 and 1956 a federal aid project made a detailed study of party boat, skiff, and other ocean sport salmon catches, primarily by sampling the landings at various ports. The figures used in Table 3 were obtained from these sources. In 1955 and 1956 party boat landings represented 65 percent of the total ocean salmon sport landings. Party boat records were used to calculate the totals for other years. An assumption, based on observations but not samples, was used to make these calculations. It was: party boat landings were 90 percent of the total from 1947 through 1950, and 65 percent from 1951 on (Eldon P. Hughes, personal communication March 1959).

California also has used a post card survey method to estimate the trend of sport fishing catches during many of the years from 1936 through 1957 (Calhoun, 1950, 1951, and 1953; Skinner, 1955; and Ryan, 1959). In this method questionnaires are sent to a random sample of license holders. Post card surveys are suspect for a variety of reasons, and in this instance the federal aid study of 1955-1956 demonstrated that in 1956 the post card returns gave an estimate of the ocean salmon fishery that was nearly three times what it should have been.

OCEAN CATCH OF SALMON BY STATES

Washington

The phenomenal growth of the ocean sport fishery in Washington was further hastened by funds allocated by the Corps of Engineers for building and enlarging small boat basins. Westport, located about midway along the Washington coast, was relatively unknown prior to 1950. It is now the center of sport fishing activities and boasts one of the finest protected boat basins along the coast. Within a few minutes, fishermen leaving this small coastal town can be in a position to intercept the salmon runs moving either north or south. The ocean sport fisheries in Washington appeared relatively minor until 1952 (Table 1, Figures 1 and 2).

TABLE 1

Washington Ocean Sport and Commercial Troll Catches in Thousands of Fish and Percent Sport Catch 1947 Through 1958

Year	Commercial catch		Sport catch[1]		Total fish		Percent sport	
	Chinook	Silvers	Chinook	Silvers	Chinook	Silvers	Chinook	Silvers
1947	325	584	6	3	331	587	1.8	0.5
1948	286	746	6	3	292	749	2.1	0.4
1949	291	518	8	4	299	522	2.7	0.8
1950	257	551	17	13	274	564	6.2	2.3
1951	331	634	34	15	365	649	9.3	2.3
1952	407	843	92	30	499	873	18.4	3.4
1953	419	665	46	50	465	715	9.9	7.0
1954	384	403	71	63	455	466	15.6	13.5
1955	385	494	84	61	469	555	17.9	11.0
1956	295	706	118	140	413	846	28.6	16.5
1957	359	737	102	192	461	929	22.1	20.7
1958	270	525	84	145	354	670	23.7	21.6

[1] Columbia River sport landings have been equally divided between Washington and Oregon and are included in part herein.

The ocean sport catch for chinook salmon has ranged from a low of nearly 2 percent to a high of nearly 29 percent of the total catch during the years 1947 through 1958. Silver catches have ranged from less than 1 percent to nearly 22 percent during the same period.

Oregon

Ocean sport salmon fishing in Oregon showed nearly the same mushrooming increase as in the State of Washington. Sport fishing occurred on a minor scale for a number of years in Coos, Winchester, and Depoe bays but was negligible until 1955 (Table 2, Figures 1 and 2).

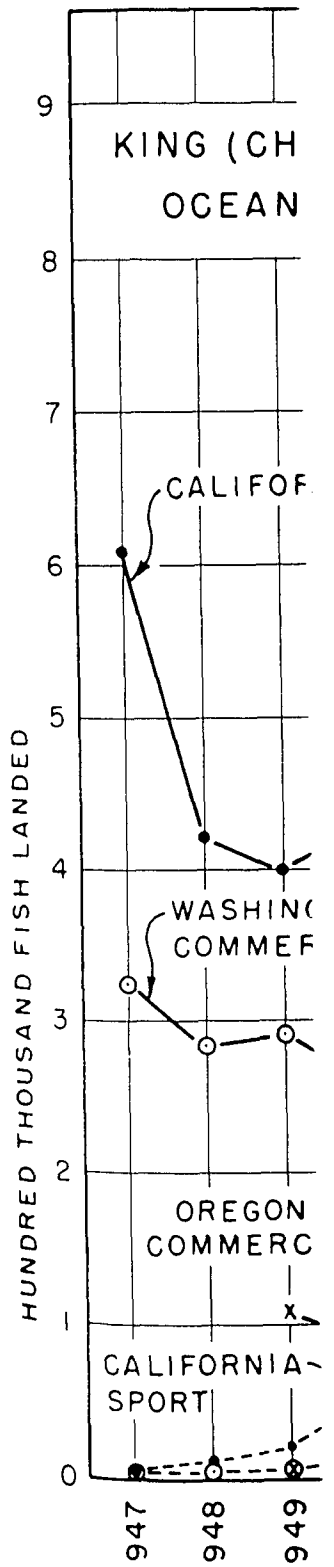
TABLE 2

Oregon Ocean Sport and Commercial Troll Catches in Thousands of Fish and Percent Sport Catch 1949 Through 1958

Year	Commercial catch		Sport catch[1]		Total fish		Percent sport	
	Chinook	Silvers	Chinook	Silvers	Chinook	Silvers	Chinook	Silvers
1949	109	173	8	13	117	186	6.8	7.0
1950	88	164	11	3	99	167	11.1	1.8
1951	212	279	10	6	222	285	4.5	2.1
1952	237	353	11	16	248	369	4.4	4.3
1953	150	278	15	13	165	291	9.1	4.5
1954	195	240	17	22	212	262	8.0	8.4
1955	307	267	59	44	366	311	16.1	14.1
1956	334	449	51	105	385	554	13.2	19.0
1957	251	551	79	124	330	675	23.9	18.4
1958	174	195	74	59	248	254	29.8	23.2

SOURCES: Commercial landings from the Oregon Fish Commission Research Laboratory in Astoria, Oregon. Sport catch estimates from Dr. John Rayner of the Oregon Game Commission, Portland, Oregon.

[1] Columbia River sport landings have been equally divided between Washington and Oregon and are included in part herein.



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ers	Percent sport Chinook	Silvers
587	1.8	0.5
749	2.1	0.4
522	2.7	0.8
564	6.2	2.3
649	9.3	2.3
873	18.4	3.4
715	9.9	7.6
466	15.6	13.5
555	17.9	11.0
846	28.6	16.5
929	22.1	20.7
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186	6.8	7.0
167	11.1	1.8
285	4.5	2.1
369	4.4	4.3
291	9.1	4.5
262	8.0	8.4
311	16.1	14.1
554	13.2	19.0
675	23.9	18.4
254	29.8	23.2

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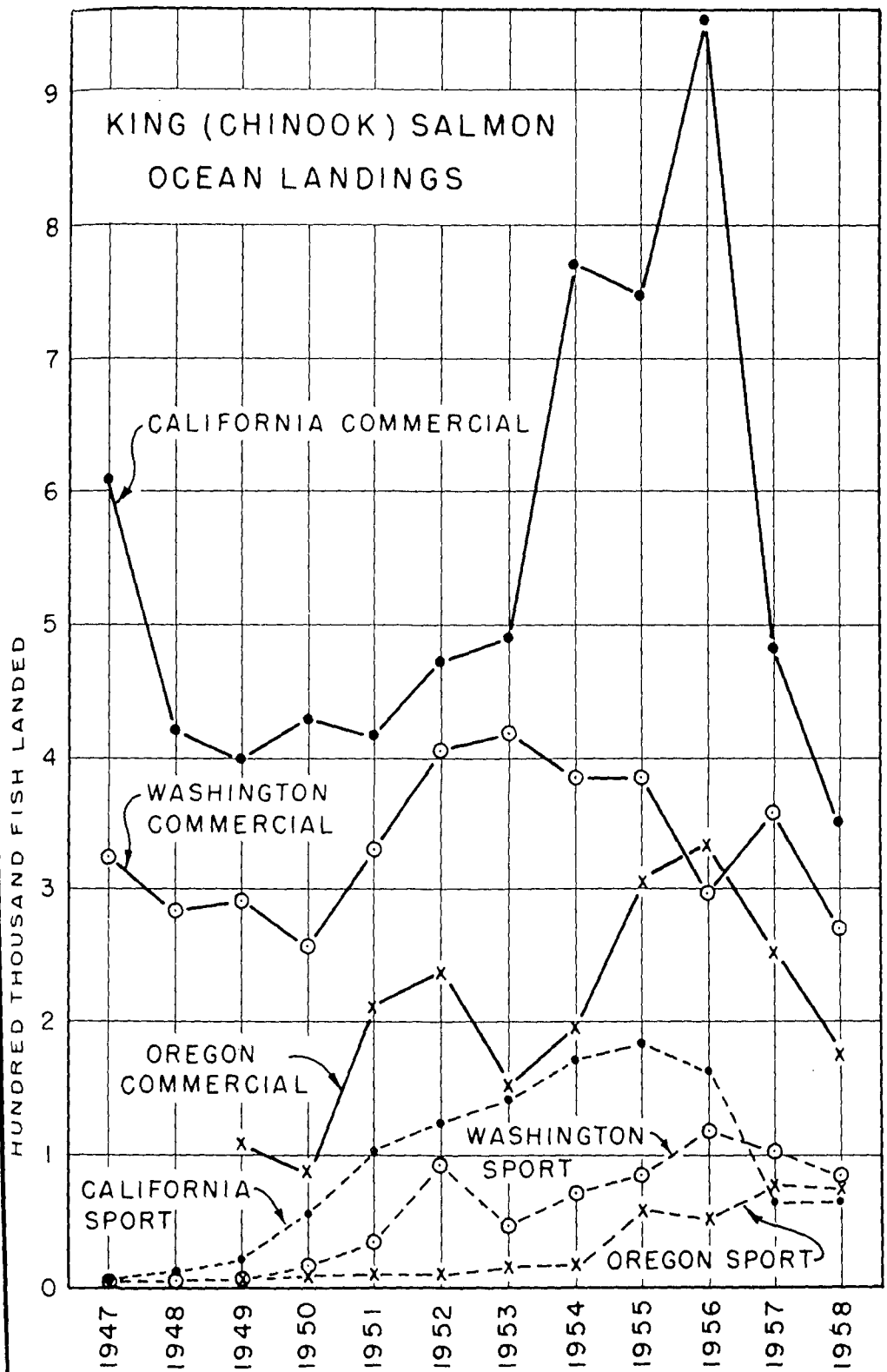

FIGURE 1. KING (CHINOOK) SALMON. Numbers of ocean caught king salmon landed by commercial and sport fishermen in Washington, Oregon, and California.

The percent ocean sport catch by species has risen from over 4 in 1952 to nearly 30 in 1958 for chinook salmon, and from nearly 2 to over 23 for silver salmon in 1950 and 1958 respectively. Silver salmon contribute the major share of the ocean sport catch in this state, averaging nearly 55 percent from 1949 through 1958. This relationship holds true in the commercial fishery also.

California

Sport fishing for salmon in California occurs, for the most part, from Monterey Bay northward. Significant catches are made in Monterey Bay, off San Francisco Bay, off Fort Bragg, and northward from Eureka. The fishery first became important at San Francisco which was and is primarily a party boat fishery. In the other areas the proportion of skiff catches is much higher. (Total landings of sport and commercial salmon are shown in Table 3 and Figures 1 and 2.)

The ratio of king to silver salmon varies from port to port and season to season, but for purposes of estimating the numbers of silver salmon for Table 3 it was assumed that the relationship found in 1955 and 1956 existed from 1947 through 1958. During those seasons 7.4 percent of the total sport landings were silvers.

Of the total salmon catch in California, the catch by the ocean sport fishery has ranged from less than 1 percent in 1947 to a high of 22 and 21 percent in 1953 and 1955 for chinook and silver salmon respectively. The dramatic increase in landings which occurred in 1951 has fallen off in 1957 and 1958.

KING *(Chinook)* SALMON

The chinook catches of all states have been combined to indicate the relative strength of the sport catch along the West Coast (Table 4). Wendler and Junge (1957) have pointed out that more than one

TABLE 3

California Ocean Sport and Commercial Troll Catches in Thousands of Fish and Percent Sport Catch 1947 Through 1958

Year	Commercial catch		Sport catch		Total fish		Percent sport	
	Chinook	Silvers	Chinook	Silvers	Chinook	Silvers	Chinook	Silvers
1947	610	87	5	0.4	615	87.4	0.8	0.5
1948	421	93	11	1	432	94	2.5	1.1
1949	400	89	23	2	423	91	5.4	2.2
1950	430	85	57	5	487	90	11.7	5.6
1951	416	58	103	8	519	66	19.8	12.1
1952	474	92	123	10	597	102	20.6	9.8
1953	490	100	141	11	631	111	22.3	9.9
1954	771	64	171	14	942	78	18.2	17.9
1955	747	56	184	15	931	71	19.8	21.1
1956	958	68	163	13	1,121	81	14.5	16.0
1957	482	89	64	5	546	94	11.7	5.3
1958	350	20	65	5	415	25	15.7	20.0

SOURCE: Salmon and steelhead investigations, Marine Resources Branch, California Department of Fish and Game, March 1959.

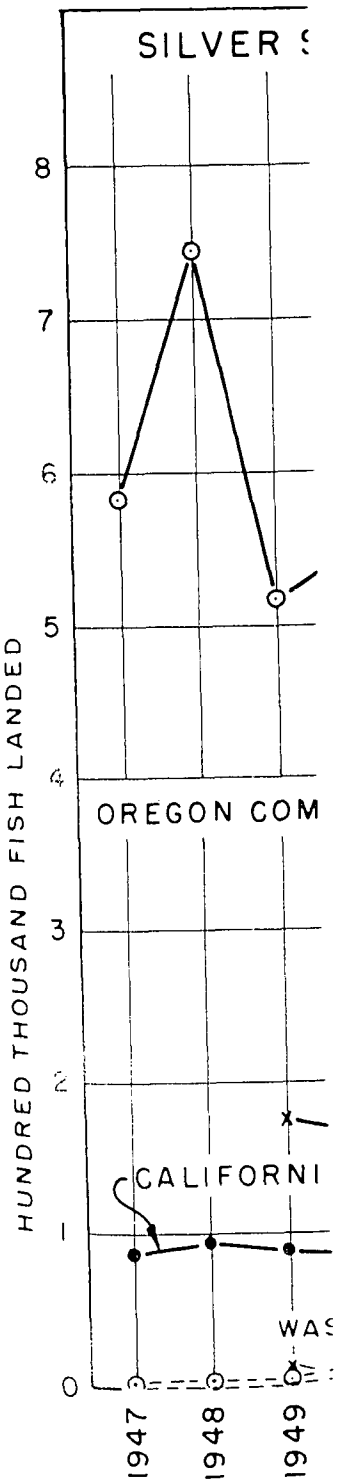

FIGURE 2. SILVER SALMON. and sport fis

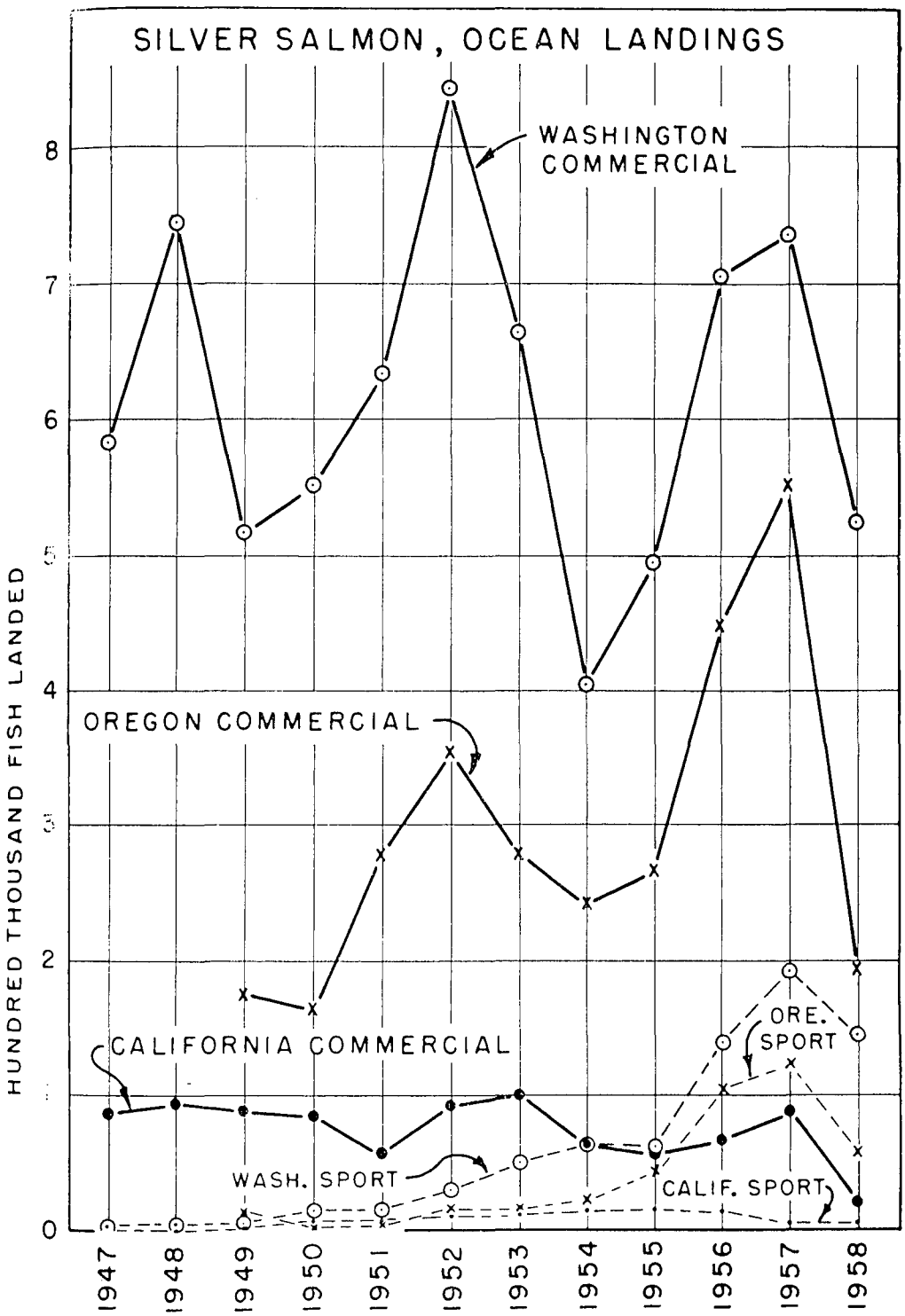

FIGURE 2. SILVER SALMON. Numbers of ocean caught silver salmon landed by commercial and sport fishermen in Washington, Oregon, and California.

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	Silvers	Chinook	Silvers
	87.4	0.8	0.5
	94	2.5	1.1
	91	5.4	2.2
	90	11.7	5.6
	66	19.8	12.1
	102	20.6	9.8
	111	22.3	9.9
	78	18.2	17.9
	71	19.8	21.1
	81	14.5	16.0
	94	11.7	5.3
	25	15.7	20.0

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year class enters the catch of both ocean troll and sport fisheries in a given year. Hence, a moving average combining at least two years was used, notwithstanding the fact that the sport fisheries operate on two, three, and possibly four year classes.

TABLE 4

Washington, Oregon, and California Combined Ocean Chinook Salmon Catches in Thousands of Fish and Percent Catch by Fishery, 1947-1958

Combined years	Commercial catch	Estimated sport catch	Total landings	Percent	
				Commercial landings	Sport landings
1947-48	1,642	28	1,670	98.3	1.7
1948-49	1,507	56	1,563	96.4	3.6
1949-50	1,575	124	1,699	92.7	7.3
1950-51	1,734	232	1,966	88.2	11.8
1951-52	2,077	373	2,450	84.8	15.2
1952-53	2,177	428	2,605	83.6	16.4
1953-54	2,409	461	2,870	83.9	16.1
1954-55	2,789	586	3,375	82.6	17.4
1955-56	3,026	659	3,685	82.1	17.9
1956-57	2,679	577	3,256	82.3	17.7
1957-58	1,886	468	2,354	80.1	19.9

Table 4 indicates that the ocean sport catch of chinook salmon is approaching 20 percent of the total catch. It was pointed out previously that both Oregon and Washington sport catches have approached or exceeded one-fourth the total ocean catch in these states. However, California sport catches were low in 1957 and 1958, which held the total percent catch for all states combined at a lower level.

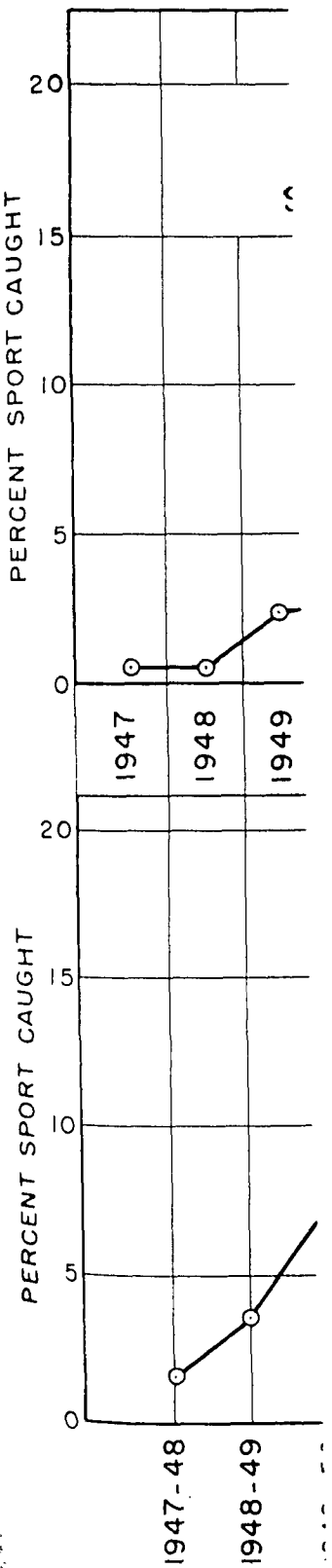
SILVER SALMON

The annual catches of silver salmon have been totaled in Table 5. In this case individual years have been used since the great majority of the silver salmon landed are in their third year.

TABLE 5

Washington, Oregon, and California Combined Ocean Silver Catch in Thousands of Fish and Percent Catch by Fishery, 1947 Through 1958

Year	Commercial catch	Estimated sport catch	Total landings	Percent	
				Commercial landings	Sport landings
1947	671	3.4	674.4	99.5	0.5
1948	839	4	843	99.5	0.5
1949	780	19	799	97.6	2.4
1950	800	21	821	97.4	2.6
1951	971	29	1,000	97.1	2.9
1952	1,288	56	1,344	95.8	4.2
1953	1,043	74	1,117	93.4	6.6
1954	707	99	806	87.7	12.3
1955	817	120	937	87.2	12.8
1956	1,223	258	1,481	82.6	17.4
1957	1,377	321	1,698	81.1	18.9
1958	740	209	949	78.0	22.0



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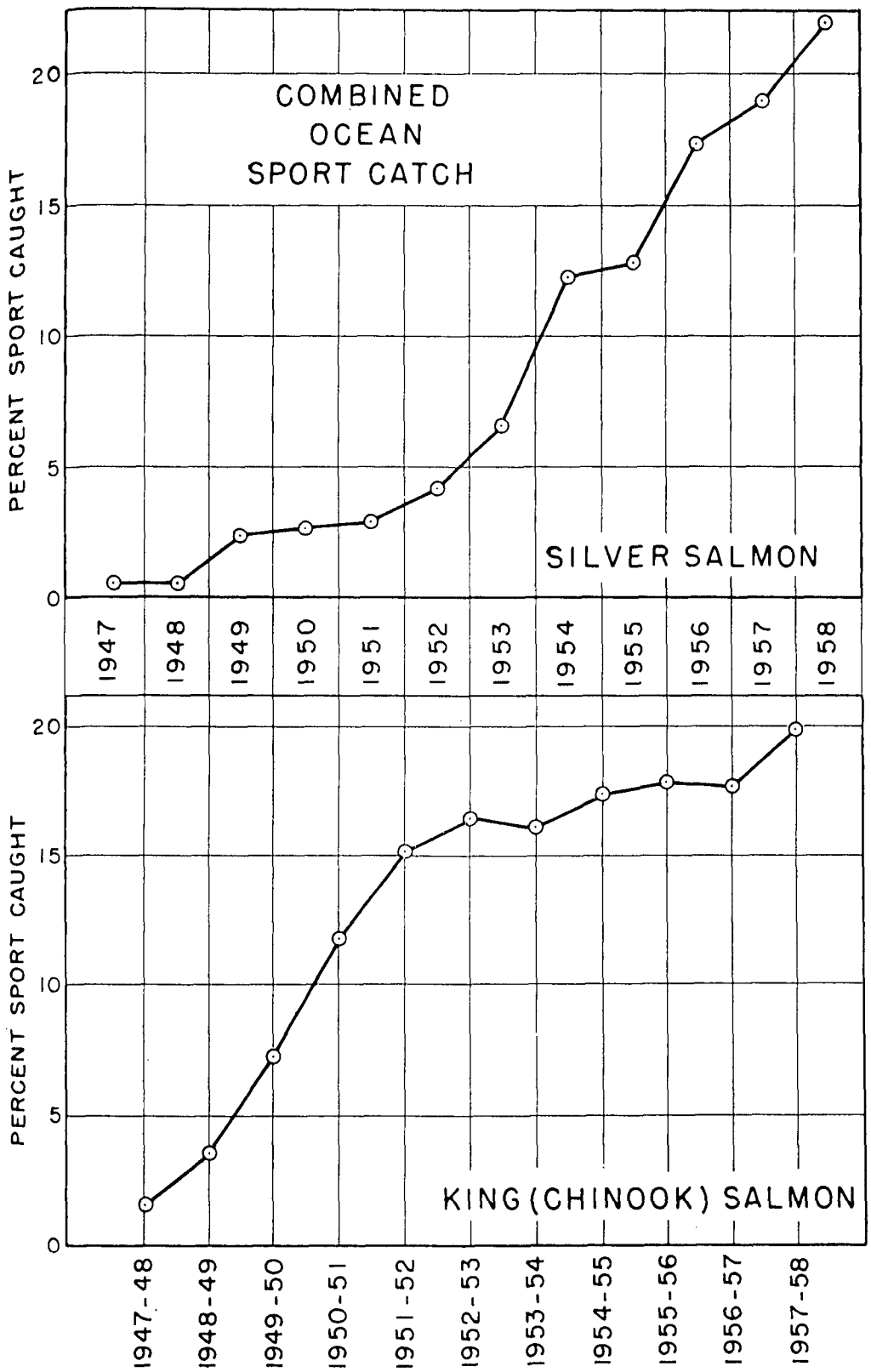

FIGURE 3. GROWTH OF THE SPORT FISHERY. Combined Washington, Oregon, and California sport catches of ocean caught salmon expressed as percent of the total ocean landings. The king salmon landings have been smoothed by a moving average of two years.

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Percent	
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98.3	1.7
96.4	3.6
92.7	7.3
88.2	11.8
84.8	15.2
83.6	16.4
83.9	16.1
82.6	17.4
82.1	17.9
82.3	17.7
80.1	19.9

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99.5	0.5
97.6	2.4
97.4	2.6
97.1	2.9
95.8	4.2
93.4	6.6
87.7	12.3
87.2	12.8
82.6	17.4
81.1	18.9
78.0	22.0

It may be observed that the sport catch of silvers is presently exceeding 20 percent of the total ocean catch. Prior to 1953, the silver salmon sport catch was minor in almost all states when greater emphasis was placed on catching the larger chinook salmon. However, with the advent of the "mooching" method of fishing which uses herring for bait, and the earlier-season fishing, silver salmon were caught in larger numbers. This, coupled with greater numbers of fisherman trips, makes the catch of this species by sport gear an important segment of the harvest.

SUMMARY OF COASTWISE SPORT CATCHES

The ocean sport catch of both chinook and silver salmon has increased phenomenally over the past 10 years and is presently accounting for over 20 percent of the total catch. There is some indication that the percent sport catch may be stabilizing on chinook salmon. The sport fisherman is extending his season in time and is tending to move into the area that normally was fished only by the commercial troller.

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