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CALIFORNIA SALMON FISHERY IN 1983**

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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Southwest Region

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ECONOMIC STATUS OF THE CALIFORNIA
SALMON FISHERY IN 1983

I. OVERVIEW

The California salmon fishery experienced the poorest fishing season on record in 1983. Total landings and the number and condition of spawning adults returning to major river systems were extremely depressed not only in California but also along the entire coast. The combined California landings of salmon by all components of the fishery was 443,000 fish in 1983, a decrease of 59 percent from 1982 landings of 1,079,000 fish and 53 percent below the 1978-1982 state average.^{1/} In addition, the average size of salmon in 1983 (5.4 lbs.) was noticeably smaller than in 1982 (9.15 lbs.). Troll landings into California were 2.4 million pounds with an ex-vessel value of \$4.7 million in 1983.

Total landings of salmon in the Washington, Oregon and California (WOC) ocean commercial and recreational fishery were an estimated 1,502,000 fish in 1983 (Pacific Fishery Management Council, 1984), a decrease of 47 percent from the 1982 three-state ocean salmon harvest and 52 percent below the 1978-1982 three-state average. Factors that partially explain the record low production in 1983 include the altered ocean conditions associated with El Nino, reduced stock sizes, and poor market conditions, leading to reduced effort (PFMC, 1984).

Both components of the WOC ocean salmon fishery had substantially reduced catches, with commercial troll landings (979,000 fish) falling by 54 percent and ocean recreational catches (523,000 fish) down by 25 percent in 1983. The WOC commercial troll fishery landed only 5.5 million pounds of salmon (dressed weight), compared to 16.5 million pounds in 1982 (Table 1). The troll landed catch was 68 percent below the 1978-1982 three-state average. The total ex-

vessel value of WOC troll landings was \$8.5 million in 1983 and was sharply down from the \$36.6 million of troll salmon landed in 1982 (Table 1).

Within California there are five distinct components to the salmon fishery: (1) commercial ocean troll fishery; (2) ocean recreational charterboat fishery; (3) private boat ocean recreational fishery; (4) in-river Indian subsistence fishery; and (5) in-river recreational fishery.^{2/} The ocean troll and recreational fisheries historically account for over 90 percent of total California salmon landings.

II. STATUS OF CALIFORNIA FLEETS

A. Commercial Ocean Troll Fleet

Commercial ocean troll landings of salmon in California were 2,407,000 pounds (dressed weight) in 1983, a decrease of 70 percent from 1982 troll landings (7,968,000 pounds) and 66 percent below the 1978-82 average of 7,086,000 pounds (Table 2).^{3/} This was the smallest commercial catch since landings statistics have been compiled in California; only the 2.74 million pounds of salmon landed in 1939 approached the low production of the 1983 season. The substantial reduction in troll landings applies to both coho and chinook salmon. The dominant chinook catch, which made up 88 percent of the 1983 total, went from 7,332,000 pounds in 1982 to just 2,109,000 pounds in 1983, a 71 percent decline. The decline in troll salmon landings was felt in all major north and south coast ports.

The ex-vessel value of salmon troll landings in California was \$4,698,000 in 1983, 76 percent below the ex-vessel value of troll landings in 1982 and 71 percent below the average ex-vessel value from 1978-1982 (Table 1). The value of troll chinook salmon landings was \$4,288,000, far below the \$18.9 million

in ex-vessel revenues generated by chinook landings in 1982 (Table 2) ^{4/} Ex-vessel prices for chinook salmon averaged \$2.03 per pound in 1983, substantially lower than the estimated average price of \$2.58 per pound paid at the dock in 1982. ^{4/} Coho salmon ex-vessel prices averaged \$1.23 per pound in 1983 compared to an estimated \$1.45 per pound in 1982. After adjusting for inflation, ^{5/} the value of the 1983 California salmon troll catch was 76 percent lower than the 1982 ex-vessel value and about 74 percent under the 1978-1982 average value. The extremely low ex-vessel chinook prices induced more fishermen to sell their catches directly to restaurants and retail markets instead of to processing plants. In 1983, 6,000 California fishermen attained licenses to sell salmon as wholesalers and retailers compared to 1,500 in 1982 (CDFG, 1984).

A total of 3,216 troll vessels landed salmon in California during 1983, down 29 percent from 1982. ^{6/} The total number of days fished (43,100) by trollers in waters off California was less than half the days fished in 1982 (92,600 days). Poor market conditions and low catches contributed to the large drop in fishing effort in 1983. Total days fished were down by over 57 percent in the major north coast ports. Along the south coast, the number of fishing days dropped 58 percent in San Francisco and 28 percent in Monterey respectively. Along with the reduction in fishing days, catch and revenue earned per day declined substantially along the entire California coast. Success rates, measured in terms of numbers and pounds of fish per fishing day, were slightly over 7.5 salmon (54.3 lbs.) in 1983 compared to 9.2 salmon (84.2 lbs.) during the 1982 season. Gross revenue per fishing day fell from approximately \$210 per day in 1982 to \$110 per day in 1983.

A rough indicator of the economic performance of the harvesting fleet is provided by average gross revenues per vessel. It is estimated that troll vessels landing in California averaged only about \$1,450 per vessel from salmon in 1983 compared to over \$4,700 per troll vessel in 1982.^{7/} A partial explanation for the decline in effort and catch is that more troll vessels switched to the potentially more lucrative albacore fishery. In general the coastal albacore catch improved in 1983, although albacore tended to be farther offshore, especially off Washington, because of the warmer water and poorly defined thermoclines. Off California, however, albacore landings were 64 percent greater than in 1982 and there was good near-shore fishing during July and August in central and northern portions. Thus, depressed earnings in the salmon fishery may have been offset to some degree by increased albacore production for some vessels. However, albacore ex-vessel prices were down in 1983, consequently troll vessels could not depend on albacore to fully compensate for lost salmon earnings. California Dungeness crab landings in 1983 were about half those of 1982; therefore, crab probably was not a dependable alternative fishery for troll vessels. There are currently no data to quantify the extent to which net earnings from salmon fishing or other complementary fisheries may have changed in 1983. The disastrous 1983 season led governors from each of the coastal states to request disaster relief assistance for salmon trollers from the Small Business Administration. A bill which would make trollers eligible for low-interest loans has passed the U.S. House of Representatives and is under consideration in the Senate.

Employment in the salmon harvesting sector is directly related to the size of the fleet and total days fished. Thus, a smaller fleet suggests that employment in the salmon harvesting sector declined in 1983. Assuming a crew size of 2 per vessel, the number of man days spent fishing for salmon in 1983 was 86,200 compared to 185,200 man days in 1982.

Many salmon stocks will be at a depressed level in 1984. Abnormal oceanographic conditions associated with El Nino are apparently responsible for adversely impacting ocean salmon production (PFMC, 1984). In 1983, upwelling conditions were extremely poor, probably causing low survival in the ocean. Salmon production in 1984 will depend in part on plankton production (an important part of the salmon food chain) and whether large, warm water masses reappear. It appears that the elevated water temperatures occurring in 1983 are returning to normal. If so, juvenile salmon survival in the ocean may improve. Due to the unusual events in 1983, the salmon troll fleet will face more restrictive management measures to protect salmon stocks during the 1984 fishing season.

The PFMC was considering a substantial cutback in the number of fishing days and lower quotas to protect important salmon stocks, especially Klamath River and Columbia River chinook and Oregon Production Index area coho. The long-run impact on salmon stock conditions remains uncertain; however, continued low spawning escapement may result in poor recruitment to the fishery in future years.

B. Sportfishing Fleet

Salmon are caught by anglers fishing for recreation on commercial passenger fishing vessels (CPFV), on private boats, and in rivers. The 1983

recreational catch totalled approximately 100,600 fish. This was 52 percent lower than the estimated 208,500 salmon caught in the recreational fishery in 1982.

The recreational ocean catch (charter and private boats) comprised 88 percent of the total sport harvest, compared to 83 percent in 1982. The ocean sportfishing fleet caught only 89,000 salmon which is a 49 percent decrease from the 1982 ocean sport catch (Table 3). Landings of chinook salmon (62,100 fish) decreased 58 percent while the coho salmon ocean sport catch increased slightly from 24,600 to 26,900 fish. Angling effort fell by 8 percent in north coast ports and by 47 percent in south coast ports. The drop in San Francisco area effort accounted for almost all of the dropoff in angler trips along the southern coast. The total number of angler trips taken in the recreational ocean salmon fishery was 111,600 or 35 percent below 1982 participation rates (Table 3). The angling success rate of 0.80 salmon/trip was under the 1982 catch rate by 22 percent.

There is no information available on the breakdown of the 1983 California recreational ocean salmon catch between CPFV anglers and private boat anglers. For earlier years, data have distinguished between charterboat and private skiff catches landed in San Francisco, but not for other ports (see PFMC, 1983). The majority of California salmon charterboats are located in the San Francisco Bay area. From 1978-1982 charter and private boats accounted for about 80 percent and 20 percent of the ocean recreational salmon catches landed in San Francisco respectively (PFMC, 1983). If this average held in 1983, charter boat catches would have been approximately 41,000 salmon in 1983, or 60 percent less than the estimated 102,000 fish caught by the

charter fleet operating out of San Francisco in 1982. Due to the poor recreational fishing season, many California charterboats saw trip counts down as much as 25 percent compared to the successful 1982 season. Consequently, revenues dropped considerably (PFMC, 1984).

C. Klamath River Indian Fisheries

The Department of the Interior regulates a subsistence fishery for Indian tribes on the Klamath River to provide a maximum harvest of about 30,000 fish. The 1983 in-river Indian harvest was estimated to be 7,900 adult fall chinook, about 46 percent of the 1982 adult harvest and 70 percent of the 1977-81 average harvest. Reduced stock size and high stream flows were the principal reasons for the reduced catch rates.

D. Evaluation of 1983 Management

Commercial and recreational ocean salmon fisheries in California continue to be regulated by seasons, size and bag limits to limit catch rates and total catch. The 1983 ocean commercial troll season for the north coast was shortened to 93 days compared to 131 days in 1982 in recognition of depressed Klamath River stocks. The south coast season was 137 days, about the same as in 1982, anticipating comparable run sizes. In 1983 the management boundary was switched from Pt. Arena to Cape Vizcaino because of concern for Klamath River spawning stocks. The recreational ocean season for the California coast remained unchanged from the 1982 season.

It appears the 1983 preseason abundance forecast was in error by 50 percent for Central Valley chinook. The accuracy for Klamath stocks is unknown. Table 4 gives the spawning escapement goals, in-river run size, and 1983 returns of spawners for the Klamath and Sacramento River systems. Natural spawning escapements of California fall adult chinook fell short of interim and long-term goals by 12 percent in the upper and lower Sacramento

River system. In the Klamath River, although the 1983 in-river run size was estimated to be 16 percent below the rebuilding schedule goal of 68,900 fish for the 1983-86 period total, spawning escapement of adult chinook was 13 percent above 1982 escapement and was the largest spawning escapement since 1978 (Table 4). The increase was in the Trinity River and at two basin hatcheries.

The extent to which the regulations had the desired effect is not known. Total catches were quite low, the ocean harvest rate for Central Valley chinook was lower than in 1982, and Klamath River spawning escapement improved over 1982. However, it appears that the low returns attributed to warm ocean water conditions overshadowed the effects of the regulations in 1983.

III. CALIFORNIA SALMON PROCESSING SECTOR

Several California plants engage in processing salmon, but none is exclusively dedicated to this species group because of its seasonality. At the wholesale level, west coast prices for fresh, whole, head-off king salmon were generally unsettled and lower than in 1982. Wholesale prices averaged \$3.25 for smalls (7-11 lbs.), \$3.35 for mediums (11-18 lbs.), and \$3.30-\$3.35 for large salmon (Seafood Price Current, 1983). In 1982, wholesale prices for small, medium, and large kings were \$3.15, \$3.50, and \$3.75 per pound respectively (Seafood Price Current, 1982). Relatively few large king salmon were available at the wholesale level in 1983 because the average size was smaller than normal. This may partially explain the lack of a clear price differential for large kings. The small and medium size market category is an undesirable size for the high-priced European smoker salmon market.

IV. MARKETS FOR CALIFORNIA SALMON

The decrease in the quantity of fresh salmon produced off Washington, Oregon and California in 1983 was more than offset by the large supply of frozen Alaskan salmon competing in west coast markets. The 1983 Alaskan salmon harvest exceeded 120 million fish and was the second highest production year in history (Pacific Fishing, 1983). This was the fourth consecutive year that production surpassed 100 million fish in Alaska, and production is projected to exceed 100 million fish again in 1984.

Because of the recent record harvests and the slow recovery of canned salmon markets, Alaskan processors began freezing large amounts of salmon in 1982 and frozen salmon inventories were at record high levels at the beginning of 1983. U.S. salmon cold storage holdings were 41 million pounds in January 1983, compared to 17.8 million pounds in January 1982 (Table 5). The large carryover of inventories into 1983 forced processors to liquidate a large quantity of frozen salmon prior to the start of the 1983 fishing season. Cold storage holdings of U.S. salmon declined from 41 million pounds in January to slightly over 10 million pounds by June 1983, a drop of over 75 percent (Table 5). Frozen inventories climbed at the end of 1983, but were not as high as in 1982, probably because canned salmon markets have recovered from the botulism incident of 1982. The proportion of Alaskan salmon absorbed by the canning industry returned to normal in 1983. The data in Table 6 show the U.S. canned salmon pack and canned salmon exports over the last ten years. The canned pack dropped from 221 million pounds in 1981 to 119.5 million pounds in 1982, but recovered to an estimated 191 million pounds in 1983. After a 35 percent decline in domestic canned salmon exports during 1982, the quantity of U.S. canned salmon exported in 1983 recovered to 54.5 million pounds, an increase of 32 percent.

Adding to the apparent weakness in domestic salmon markets was the continued importation of farm-reared salmon from Norway. The volume and value of Norwegian salmon imported into U.S. markets was 5.1 million pounds and \$16,566,000 respectively in 1983 (Department of Commerce, Bureau of Census). Poundage increased over 230 percent and the declared value was up 221 percent above 1982 levels. The Norwegian product is supplied fresh on a year-round basis and competes directly in the high-quality, fresh-frozen troll salmon market.

The total value (through November 1983) of fresh, chilled or frozen, whole or eviscerated salmon exported from Washington, Oregon, and California was approximately \$41.3 million, compared to over \$56.0 million in U.S. salmon exports over the same period in 1982. The dollar value of exports reflects salmon passing through WOC U.S. Customs Districts. Therefore, salmon caught in Alaska, and shipped, processed and packaged in WOC are included in the value estimates. The exported value of salmon landed in WOC cannot be determined with available data.

Japan is the major importer of U.S. salmon products. Exports of fresh-chilled or frozen salmon (all species) to Japan totalled approximately 189.6 million pounds in 1983, down 4 percent from the estimated 198.4 million pounds exported to Japan in 1982 (Department of Commerce, 1982 and 1983). The value of these exports (\$288.3 million) was 9 percent lower than the value of frozen salmon destined for Japan in 1982. Contributing to the decline in the quantity of U.S. frozen salmon exports were the unusually high frozen salmon inventories in Japan and the record high fall chum salmon catches off Hokkaido in both 1982 and 1983. Japan entered 1983 with 115.5 million pounds of frozen salmon in cold storage compared to 73.1 million pounds beginning the year in 1982 (Department of Commerce, Southwest Region, 1982 and 1983). The fall chum

salmon catch in Japan was over 21 million fish and was the third consecutive year in which the chum harvest exceeded a record 20 million fish. In Europe, a relatively high valued dollar contributed to the decline in U.S. salmon exports to France, which is the largest European importer of frozen salmon (Pacific Fishing, 1983). An additional source of competition in the European market was apparently the increase in the supply of Norwegian farmed Atlantic salmon entering France's premium salmon markets for large fish.

TABLE 1- California, Oregon and Washington landings (thousands of pounds dressed weight) and exvessel values (thousands of dollars) for the Ocean troll salmon fisheries from 1977-1983.

YEAR	CALIFORNIA		OREGON		WASHINGTON		TOTAL	
	LBS	VALUE	LBS	VALUE	LBS	VALUE	LBS	VALUE
1977	5928	11886	6501	11484	7931	10940	20362	34310
1978	6811	11049	4672	7340	4889	10025	16372	28414
1979	8724	21985	7272	16988	7878	NA	23875	38973
1980	5907	13149	4361	8185	3474	NA	13743	21334
1981	6020	15097	5221	9570	3894	5921	15136	30588
1982	7967	19966	5059	9895	3463	6730	16490	36591
1978-82 AVERAGE	7085	16249	5317	10395	4720	4535	17123	31180
1983	2407	4697	1753	2296	1327	1465	5487	8458

TABLE 2- California Ocean Troll Salmon Landings (thousands of pounds) and Ex-vessel value (thousands of dollars) from 1977-1983.

YEAR	CHINOOK			COHO			TOTAL*		
	LBS	NOMINAL	REAL	LBS	NOM.	REAL	LBS	NOM.	REAL
1977	5606	11489	8195	298	368	262	5928	11886	8478
1978	5471	9399	6253	1317	1605	1068	6810	11049	7351
1979	7498	19309	11817	1192	2612	1598	8724	21985	13454
1980	5607	12741	7133	300	408	228	5907	13149	7362
1981	5474	14156	7241	475	804	411	6020	15097	7722
1982	7331	18914	9128	548	796	384	7967	19966	9636
1983	2108	4287	1988	265	327	151	2407	4697	2178

* TOTALS INCLUDE POUNDS AND VALUE OF MISCELLANEOUS SALMON

TABLE 3- California Recreational Salmon Landings
from 1977-1983.

YEAR	OCEAN RECREATION			IN-RIVER*		
	NO. TRIPS	CHINOOK	COHO	TOTAL OCEAN	KLAMATH RIVER	SACRAMENTO RIVER
1977	215000	104000	14300	118300	NA	NA
1978	176100	83900	44300	128200	3776	NA
1979	173400	122400	15600	138000	4322	NA
1980	142100	86200	20900	107100	7190	12320
1981	128000	83700	9700	93400	13235	18340
1982	170400	149200	24600	173800	19781	14980
1983	111600	62100	26900	89000	4695	6885

* ALL CATCHES ARE FOR BOTH ADULT AND JACK SALMON; STATISTICS EXCLUDE RECREATIONAL CATCHES FOR THE SMITH, MAD, EEL, AND RUSSIAN RIVERS; CATCHES FOR THE SACRAMENTO RIVER SYSTEM ARE ESTIMATES OBTAINED FROM CALIF. DEPT. OF FISH AND GAME; CATCHES FOR THE KLAMATH RIVER ARE FROM PFMC SALMON PLAN (1984)

Table 4 - Spawning escapement goals, run sizes, and natural fall-run adult chinook salmon escapements for the Klamath and Sacramento River systems from 1978-1983.

<u>Year</u>	<u>Goal</u>	<u>Klamath*</u>		<u>Sacramento</u>		
		<u>In-River Run</u>	<u>Spawning Escapement</u>	<u>Goal</u>	<u>In-River Run</u>	<u>Spawning Escapement</u>
1978	-	91,400	71,500	60,000	N/A	47,000
1979	-	49,200	33,400	60,000	N/A	71,000
1980	-	42,100	28,000	60,000	N/A	72,000
1981	86,000	77,300	38,300	60,000	N/A	91,000
1982	86,000	62,700	40,500	60,000	N/A	90,000
1983	68,900**	57,900	45,700	60,000	N/A	52,600

* Includes hatchery escapement for the Klamath.

** This is the 1983-86 average escapement goal; the long-term goal to be achieved by 1988 is 115,000 fall-run adults.

Table 5 - U.S. Salmon cold storage holdings (round, dressed) in 1981 through 1983 (thousands of pounds)

<u>Month</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
January	24,242	17,819	40,953
February	18,240	12,396	32,881
March	12,585	9,676	26,959
April	9,361	6,409	20,324
May	7,893	6,072	12,968
June	7,762	7,493	10,265
July	15,784	32,236	23,007
August	36,604	62,131	49,663
September	38,156	68,368	50,754
October	33,962	63,019	45,369
November	29,657	58,515	46,048
December	22,314	48,943	38,362

Source: Department of Commerce, NOAA, National Marine Fisheries Service, Survey of cold storage holdings, National Fishery Statistics Program in 1981, 1982, and 1983.

Table 6 - U.S. canned salmon pack and domestic canned salmon exports from 1973
 - 1983 (thousands of pounds).

<u>Year</u>	<u>U.S. Pack</u>	<u>Domestic Exports</u>
1973	71,800	16,900
1974	87,800	8,300
1975	78,100	22,500
1976	125,399	19,600
1977	135,700	21,275
1978	148,600	32,500
1979	148,800	50,900
1980	200,000	74,000
1981	221,300	63,500
1982	119,500	41,200
1983	181,300*	54,500

Sources: Fishery Statistics of the U.S. Dept. of Commerce, NOAA, NMFS;
 U.S. Dept. of Commerce, Bureau of Census.

*Preliminary estimate.

Footnotes

- 1/ In this report the recreational in-river fishery includes catches from the Klamath/Trinity and Sacramento/San Joaquin River systems. Catch statistics for the Smith, Mad, Eel, and Russian Rivers are not available at this time.
- 2/ Excludes the five year average of the recreational in-river catch statistics for the Sacramento/San Joaquin system from 1977-1980 since they are unavailable at the present time; however, because this river system accounts for only a small proportion of the total in-river recreational catch, the five year average total California catch of 945,000 fish is not expected to change appreciably.
- 3,4/ In this report landings, value, and price estimates will differ slightly from those statistics presented in the Pacific Fishery Management Council Salmon Plan (1984) due to the use of California data obtained from California Fish and Game Bulletin Series for the respective years.
- 5/ Nominal values were deflated using the GNP Implicit price deflator (1972=100).
- 6/ The number of vessels landing in 1982 is a correction of the statistic given in the 1983 Salmon Plan Amendment (3,767 vessels), provided by Pat Lavin, Pacific Fishery Management Council staff economist in March 1983.
- 7/ This estimate for 1982 differs from the gross revenue figure given in the 1983 Salmon Plan Amendment due to the revision of the number of vessels participating in the fishery.

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