

NORTHWEST & ALASKA FISHERIES CENTER PROCESSED REPORT

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INCIDENCE OF SALMON IN JAPANESE, POLISH, AND USSR TRAWL CATCHES OFF CALIFORNIA, OREGON, WASHINGTON, AND SOUTHERN BRITISH COLUMBIA, 1976

by
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Resource Ecology and Fisheries Management Division

AUGUST, 1977

**U.S. DEPARTMENT OF COMMERCE
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Northwest and Alaska Fisheries Center
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Appendix 1.--Incidence (number per metric ton of catch) and average weight of salmon taken by foreign trawlers in the northeastern Pacific Ocean off California, Oregon, Washington, and British Columbia, 1976 (U.S. observer data).

ABSTRACT

During the summer of 1976 scientific observers under the auspices of the National Marine Fisheries Service were invited aboard selected Japanese, Polish and Soviet trawlers fishing off the coast of California, Oregon, Washington and southern British Columbia for the purpose of sampling the catches. Pacific salmon (genus Oncorhynchus) were observed in trawl catches in the Eureka, Columbia, and Vancouver areas from June through September. The estimated catch of salmon, based on their incidence per metric ton of fish catch, totaled about 4,250 by the Polish fleet from June through September, about 284 salmon by the Soviet fleet during July and August, and no salmon on a Japanese vessel fishing in the Monterey area in July and August. Most salmon observed were chinook salmon (O. tshawytscha) which averaged about 64 cm long and 4 kg in weight.

INTRODUCTION

The groundfish fishery off the west coast of North America conducted by U.S. and Canadian fishermen since the late 1800's has been marked by the intrusion in recent years of large foreign fishing fleets. During the early 1960's fleets from Japan and the USSR moved south from their newly-developed trawl fisheries in the Gulf of Alaska to areas off the California, Oregon, Washington and British Columbia coasts to target initially on rockfish, primarily on Pacific ocean perch (Sebastes alutus). The USSR fleets began targetting on Pacific hake (Merluccius productus) in 1966 and also took Pacific ocean perch. During the mid-1970's the Japanese and USSR fishing fleets were joined by vessels from Poland, South Korea, West Germany, East Germany, and Bulgaria. The average catch of groundfish by U.S. fishermen off California, Oregon, and Washington during the years 1971-75 was about 34,000 metric ton (mt). During this period the foreign catch (excluding Canada) averaged about 186,000 mt or better than 5 times the U.S. catch.

Although the U.S. does not fish for Pacific hake, which is the dominant species in the foreign catches off California, Oregon, and Washington, the U.S. fishing industry is greatly concerned over the impact of the foreign fleets on stocks important to the U.S. fishermen. As a result of bilateral agreements, the catch of hake has been limited by establishment of quotas, and certain areas known to contain populations of Pacific ocean perch have been closed to trawling. Further, in order to determine the incidental catch of various important species when the vessels target on hake, the U.S. requested that scientific observers be permitted aboard the fishing vessels to sample the catches. In 1976 Poland permitted three observers aboard three stern trawlers for one month observation periods beginning with the arrival of the fleet in June and extending to the end of September when the quota on hake was obtained. The USSR permitted three observers on three stern trawlers for a period of one month only, July 15-August 15. As part of previous agreements for accepting observers on vessels fishing in the Bering Sea and northeastern Pacific Ocean, Japan accepted an observer aboard a trawler during July and August. Observers were obtained from the scientific staffs of fishery agencies of California, Oregon, and Washington through cooperative agreements and through contracts with the College of Fisheries, University of Washington.

The objectives of the scientific observers were to obtain data on catch rates, species composition, and collect biological data on target and other species. Special efforts were made to monitor the catches for the incidence of Pacific salmon (genus Oncorhynchus) among the various species taken. The report details the observed incidence of salmon in Polish, USSR, and Japanese trawl catches during the summer hake fishery in 1976.

METHODS OF SAMPLING

The various methods of sampling aboard fishing vessels to determine the incidence of incidentally-caught species was described by Miller et al. (1976). Essentially two methods were used. In one, the observers monitored a conveyor belt which transports the fish from the receiving bin to the processing area, counting the species of interest and estimating tonnage of fish passing. In the other, the observers took representative basket samples of the catch from the bin or conveyor belt and recorded the number of Pacific halibut (Hippoglossus stenolepis), crab, and salmon (or other species) per unit weight of catch. For relatively scarce species in the catch such as halibut and salmon, the belt monitoring technique was more effective because it allowed the samplers to observe a greater proportion of the catch than was possible when taking basket samples.

The sampling technique was modified at times aboard the Polish and USSR vessels engaged in the hake fishery because of the way the catch was handled. On most vessels the catch was sorted on deck with incidental and unwanted species discarded overboard. On these occasions the observer would count all incidental and discarded fish to obtain species composition and incidence of desired species. Data on the incidence of salmon was expressed as the number per metric ton of catch. Biological data on salmon were collected as time permitted.

INCIDENCE OF SALMON

The incidence of salmon in stern trawl catches by month and by area is given in Table 1. Area divisions of the coastal waters of the north-eastern Pacific Ocean are shown in Figure 1. The incidence of salmon in trawl catches varied by national origin of vessel, area, and month. Sampling was limited on Japanese vessels to one area (Monterey) where fishing occurred off San Francisco during July and August, and no salmon were observed in the catches in 28 days of sampling. On USSR vessels, observers sampled primarily in the Columbia area and salmon incidence was low--0.004 and 0.005 fish per mt in July and August respectively.

Sampling on Polish vessels was extensive and ranged from Monterey to Vancouver areas during the 197 sampling days from June through September. In the southern area in July, and as observed on the Japanese vessel, no salmon appeared in the catches. The highest incidence in the other three areas occurred in September in the Vancouver area, 0.960 salmon per mt of catch, with catches ranging from 0.016 to 0.234 fish per mt in the Columbia area and 0.022 to 0.058 fish per mt in the Eureka area. Appendix Table 1 provides detailed data on the incidence of salmon by 1° long. by $\frac{1}{2}^{\circ}$ lat. statistical blocks.

Table 1.--Average incidence of salmon (number per metric ton of catch) in catches of Polish, USSR and Japanese stern trawlers in the north-eastern Pacific Ocean off California, Oregon, Washington and British Columbia, 1976 (U.S. observer data).

National origin of vessels and month of fishing	Statistical Areas											
	Monterey			Eureka			Columbia			Vancouver		
	Days sampled	No. of salmon	Incidence	Days sampled	No. of salmon	Incidence	Days sampled	No. of salmon	Incidence	Days sampled	No. of salmon	Incidence
Poland												
June	-	-	-	4	5	0.058	7	18	0.131	0	-	-
July	8	0	0	9	4	0.022	38	14	0.016	0	-	-
August	0	-	-	2	1	0.033	72	384	0.234	0	-	-
September	0	-	-	3	3	0.028	49	207	0.192	5	55	0.960
USSR												
July	0	-	-	1	0	0	37	2	0.004	0	-	-
August	0	-	-	0	-	-	29	2	0.005	0	-	-
Japan												
July	14	0	0	0	-	-	0	-	-	0	-	-
August	14	0	0	0	-	-	0	-	-	0	-	-

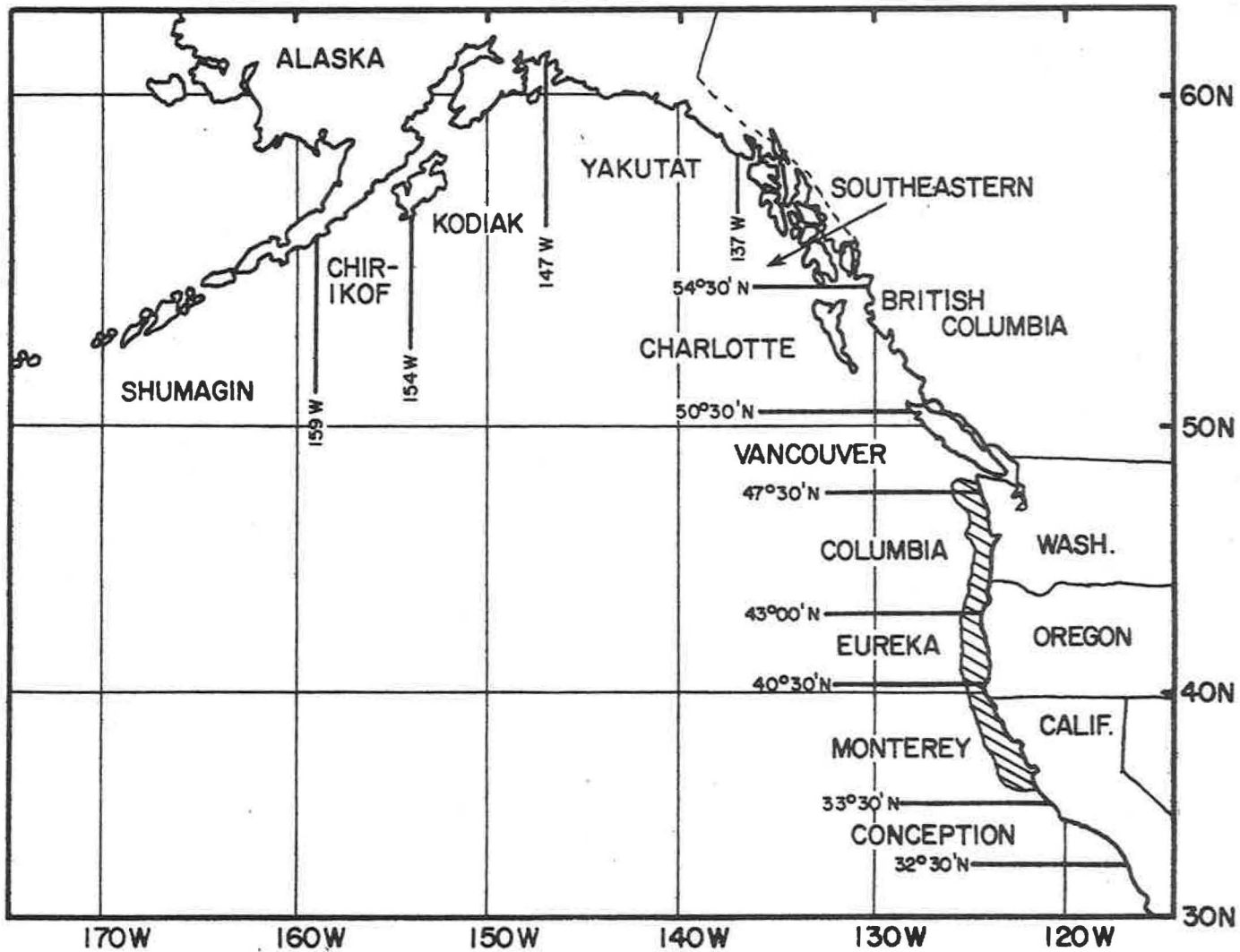


Figure 1.--Area divisions of the coastal waters of the northeastern Pacific Ocean. Shaded area illustrates the general area of the Pacific hake fishery.

For common fishing areas and months, the Polish vessels were observed to take substantially more salmon than the USSR vessels.

BIOLOGICAL DATA ON SALMON

The salmon observed in foreign trawl catches off California, Oregon, Washington, and southern British Columbia were predominantly chinook salmon (*O. tshawytscha*) which formed about 94% of the salmon sampled. The other 6% were coho salmon (*O. kisutch*).

The chinook salmon ranged in length from 35 centimeters (cm) to 110 cm (Figure 2), and averaged 63.9 cm. The average weight was 4.03 kilograms (kg). The few coho salmon that were sampled averaged 64.4 cm in length and 3.54 kg in weight.

ESTIMATED TOTAL CATCH OF SALMON

In order to estimate the incidental catch of salmon by stern trawlers off the west coast of the United States, the average incidence of salmon for each area-month block was applied to the catch for the appropriate block (Table 2). These procedures assume that the catches sampled by the observer are representative of the total groundfish catch.

The results indicate an incidental catch of approximately 4,250 salmon by Polish stern trawlers engaged in the hake fishery. Most of these were taken in the Columbia area during August and September.

As observed in Table 1, the incidence of salmon on the USSR vessels was quite low during sampling from the middle of July to the middle of August. Groundfish catches from the Soviet Union were not available by area, but in applying the incidence rates to total catches for July and August, we estimated salmon catches to be 133 and 151 fish respectively for the two months. From our limited sampling aboard Soviet vessels, it appears that the salmon catch by the Soviet fishing fleet is substantially less than that taken by Polish vessels.

LITERATURE CITED

- Miller, Mark, Larry Nelson, Robert French, and Stephen Hoag.
1976. U.S. observers board Japanese trawl vessels in Bering Sea.
Mar. Fish. Rev. 38(4):1-10.

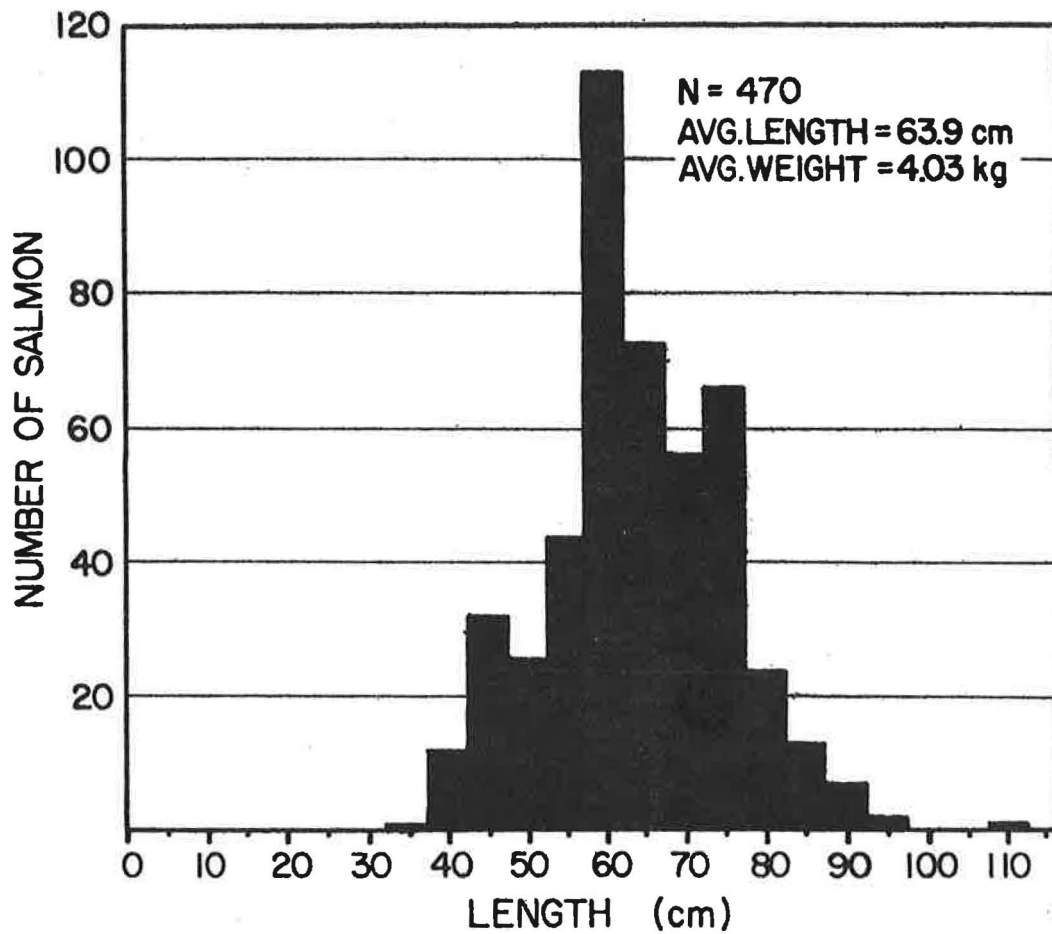


Figure 2.--Length (fork length) frequency of chinook salmon taken by Japanese and Soviet trawlers off the coast of California, Oregon, Washington and British Columbia, June-September 1976 (U.S. observer data).

Table 2.--Polish groundfish catch (June-September, 1976) and estimated catch of salmon, by area and month.

Month	Catch of groundfish and salmon	Area					Total
		Conception	Monterey	Eureka	Columbia	Vancouver	
June	Groundfish catch(mt)	--	--	2,758	865	--	273
	Estimated number of salmon	--	--	160	113	--	
July	Groundfish catch (mt)	35	1,163	812	3,956	--	81
	Estimated number of salmon	0	0	18	63	--	
August	Groundfish catch (mt)	--	--	--	8,589	--	2,010
	Estimated number of salmon	--	--	--	2,010	--	
September	Groundfish catch (mt)	--	--	292	5,711	810	1,883
	Estimated number of salmon	--	--	8	1,097	778	
October ^{1/}	Groundfish catch (mt)	--	--	--	957	3,414	4,247
	Total estimated number of salmon	0	0	156	3,283	778	

^{1/} Polish fleets left inshore areas (areas within approximately 50 of shore) and observers were removed. No estimates of salmon in the catches are available for the offshore areas.

Appendix 1.--Incidence (number per metric ton of catch) and average weight of salmon taken by foreign trawlers in the northeastern Pacific Ocean off California, Oregon, Washington and British Columbia, 1976 (U.S. observer data).

National origin of vessels and month of fishing	Statistical block	No. days sampled	No. salmon per mt	Average weight (kg)	National origin of vessels and month of fishing	Statistical block	No. days sampled	No. salmon per mt	Average weight (kg)	
Japan July	122370	11	0	--	Poland September	124423	3	0.028	4.15	
	123380	3	0	--		124430	20	0.126	4.21	
	August	122370	8	0		--	124433	12	0.079	4.50
		123380	6	0		--	124440	3	0.127	3.29
Poland June	124410	2	0	--		124443	5	0.038	5.06	
	124420	2	0.222	2.25		124450	3	0.019	4.65	
	124430	1	0	--		124463	1	1.999	2.59	
	124453	2	0.025	2.30		124470	5	1.202	2.76	
	124470	4	0.184	3.85		126483	5	0.960	4.50	
July	124383	7	0	--		USSR July	124413	1	0	--
	124390	1	0	--	124430		4	0	--	
	124410	2	0	--	124433		18	0	--	
	124413	3	0.051	6.50	124440		9	0.006	7.70	
	124420	3	0	--	124443		3	0.061	3.90	
	124423	1	0.028	5.40	124453		3	0	--	
	124430	10	0.020	5.54	August	124430	7	0.007	11.80	
	124433	10	0.002	5.90		124433	6	0	--	
	124440	13	0.022	3.19		124440	12	0.007	5.50	
	124443	4	0	--		124443	3	0	--	
124470	1	0.181	7.25	124450	1	0	--			
August	124410	1	0	--						
	124423	1	0.033	4.99						
	124430	39	0.195	4.04						
	124433	22	0.344	4.81						
	124440	7	0.341	3.95						
	124443	4	0.013	3.74						

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