

INPFC DOCUMENT
Ser. No. 2252
Rev. No. 1

AN ANALYSIS OF CATCH STATISTICS
FROM THE JAPANESE MOTHERSHIP SALMON FISHERY
AND THE CATCH OF SALMON WITHIN THE
U.S. FISHERY CONSERVATION ZONE IN 1978

by

Michael L. Dahlberg

Northwest and Alaska Fisheries Center Auke Bay Laboratory
National Marine Fisheries Service, NOAA
P.O. Box 155, Auke Bay, AK 99821

Submitted to the
INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

by the
U.S. NATIONAL SECTION

October 1979

AN ANALYSIS OF CATCH STATISTICS
FROM THE JAPANESE MOTHERSHIP SALMON FISHERY
AND THE CATCH OF SALMON WITHIN THE
U.S. FISHERY CONSERVATION ZONE IN 1978

Michael L. Dahlberg

As part of the Memorandum of Understanding [Paragraph 1(B)] appended to the amended International Convention for the High Seas Fisheries of the North Pacific Ocean, the Government of Japan will provide catch statistics to the International North Pacific Fisheries Commission (INPFC). For the mothership gillnet fishery, catch statistics are reported on a 10-day basis by $1^{\circ} \times 1^{\circ}$ statistical area. Two methods of assigning the catch to statistical areas have been discussed by the Salmon Sub-Committee of the Biology and Research Committee of INPFC.

The noon position of the motherships has been the basis for assigning the catch to statistical areas in the past. Scout boat catches were assigned to the statistical area in which they fished. Thus, although the scout catches were recorded in the areas in which fishing actually took place, the catch of an entire mothership fleet was assigned to the statistical area which the mothership occupied at noon. In many instances catcher boats may not fish in the statistical area determined by noon position of the mothership.

The preferable method for assigning catches to statistical areas is to use the location where each catcher boat sets its gear. This method is clearly superior for it indicates the true geographic location where the fish were caught; the noon position of the mothership is of no biological significance in studies of salmon distribution.

Using data collected by U.S. salmon observers aboard the motherships within the U.S. Fishery Conservation Zone (FCZ) in 1979, I tabulated the catches of all species of salmon by both methods and then compared the results by statistical area (Table 1). Differences as great as 300% occurred in some statistical areas. Most differences were between 6% and 50%, ignoring the positive or negative sign. The weighted average absolute difference was 67%, based on the method of catcher-boat location. If catch-effort data are to be used in studying the distribution of salmon within the mothership operating area, then the method of assigning catch and effort to statistical areas based on catcher-boat gear location should be used.

Table 1.--Comparison of two methods of tabulating salmon catches in numbers of fish from the Japanese Mothership Salmon Fishery within the FCZ.

INPFC Statistical Area (A)	Method of tabulation		Difference (B-C)	Percentage difference (B-C/C)
	Mothership noon position (B)	Catcher-boat location (C)		
6851 E	3,147	29,840	-26,693	-89
6852 E	1,177	1,894	-717	-38
6950 E	42,243	23,322	18,921	81
6951 E	65,532	63,692	1,840	3
6952 E	42,250	31,487	10,763	34
7049 E	573	5,897	-5,324	-90
7050 E	89,012	88,381	631	1
7051 E	129,272	84,139	45,133	54
7052 E	89,882	124,065	-34,183	-28
7053 E	6,034	9,761	-3,727	-38
7149 E	44,388	32,547	11,841	36
7150 E	121,412	177,280	-55,868	-32
7151 E	140,673	194,643	-53,970	-28
7152 E	229,064	197,580	31,484	16
7153 E	14,219	27,478	-13,259	-48
7154 E	984	984	0	0
7249 E	83,249	88,304	-5,055	-6
7250 E	281,004	329,561	-48,557	-15
7251 E	299,962	298,641	1,321	<1
7252 E	53,548	84,255	-30,707	-36
7253 E	4,786	10,827	-6,041	-56
7254 E	4,266	4,266	0	0
7349 E	289,991	155,117	134,874	87
7350 E	1,053,295	385,971	667,324	173
7351 E	1,005,045	444,745	560,300	126
7352 E	0	677	-677	-100
7353 E	0	5,400	-5,400	-100
7354 E	2,961	26,645	-23,684	-89
7449 E	101,791	166,325	-64,534	-39
7450 E	230,191	670,549	-440,358	-66
7451 E	150,022	913,228	-763,206	-84
7452 E	103,260	33,772	69,488	206
7453 E	6,513	8,705	-2,192	-25
7454 E	40,005	9,773	30,232	309
7455 E	2,506	2,506	0	0
TOTAL	4,732,257	4,732,257	3,168,304 ^a	67

^a Total of absolute values.

CATCH OF SALMON WITHIN THE FCZ DURING 1978

The Japan Fisheries Agency furnished catch statistics for the 1978 season during the research coordination meeting in Tokyo in March 1979. I have summarized their data (Table 2) and allocated the catch between the FCZ and seaward of the FCZ (Table 3). About 65% of the total quota was caught in the landbased driftnet fishery. This fishery accounted for 4 times more pink salmon and coho salmon than the mothership fishery, but took less than half of the combined catches of sockeye salmon by both fisheries. An estimated total of 421,000 salmon of western Alaska origin were intercepted in these two fisheries. The allocation of the catch inside and outside the FCZ in 1978 confirms our salmon observer data from that year (Table 3). The four fleets concentrated their effort inside the FCZ in Subarea 5, near and south of Attu, where they took nearly 1.5 million sockeye salmon. An estimated 247,000 of these fish were destined for western Alaska. Only 15 of 53 fleet days allowed under International Convention for the High Seas Fisheries of the North Pacific Ocean Annex were fished north of 56°N latitude in the Bering Sea. One catch of 1,138 salmon was reported by the JFA in statistical area 7656W¹, at least 4 nautical miles inside the FCZ--an area closed to fishing. In 1979 the motherships fished fewer fleet days than in 1978, however, the fishing effort within the FCZ actually increased significantly in 1979--from 61% in 1978 to 70% in 1979 (Table 4).

Table 2.--Summary of 1978 catch of Japanese High Seas Salmon Fisheries and estimates of interceptions of Western Alaska Salmon (thousands of fish).

Fishery	Salmon species					Total
	Sockeye	Chum	Pink	Coho	Chinook	
Mothership	1,882	3,802	1,853	609	105	8,251
Landbased driftnet	<u>1,292</u>	<u>3,488</u>	<u>7,846</u>	<u>2,512</u>	<u>210</u>	<u>15,348</u>
Total	3,174	7,290	9,699	3,121	315	23,599
Estimated Interceptions ^a by Mothership Fishery	382	8	0 ^b	0 ^b	31	421

^a Based on average interception rates in the mothership fishery since 1956.

^b Estimates of interception rates are not available for the mothership fishing area after 1977.

¹ During the 26th Annual Meeting it was discovered that the Japanese numbering system used for statistical areas was not the same as used by the INPFC. Therefore, the area 7656W should be expressed as INPFC statistical area 7756W which is seaward of the U.S. FCZ.

Table 3.--Summary of 1978 catch of salmon by the Japanese Mothership Salmon Fishery with respect to the Fishery Conservation Zone, and estimates of interceptions of Western Alaska Salmon (thousands of fish).

	Salmon species					Total
	Red	Chum	Pink	Coho	Chinook	
Within FCZ						
Mothership Catch	1,529	2,446	1,136	97	53	5,259
Interceptions ^a	247	b/	--	--	19	266
Seaward of FCZ						
Mothership Catch	355	1,356	717	512	52	2,992
Interceptions	135	8	--	--	12	155
Total						
Mothership Catch	1,882	3,802	1,853	609	105	8,251
Interceptions	382	8	--	--	31	421

^a From average interception rates of the mothership fishery since 1956; no estimates are available for coho salmon and pink salmon.

^b A catch of less than 600 chum salmon was reported in INPFC area 7656W, inside the FCZ. (see footnote 1)

Table 4.--Comparison of Japanese Salmon mothership fishing effort in 1978 and 1979 inside the FCZ.

Mothership	Total days fished		
	1978	1979	change
1	52	51	-1
2	52	51	-1
3	53	48	-5
4	<u>50</u>	<u>51</u>	<u>+1</u>
Total	207	201	-6
Mothership	Total days fished in FCZ		
	1978	1979	change
1	31	36	+5
2	27	35	+8
3	38	33	-5
4	<u>30</u>	<u>36</u>	<u>+6</u>
Total	126	140	+14