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REPORT OF U.S. OBSERVATIONS OF THE JAPANESE MOTHERSHIP  
SALMON FISHERY AND RESEARCH VESSEL CRUISES DURING 1979

by

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## U.S. SALMON OBSERVER PROGRAM IN 1979

### INTRODUCTION

As part of the Annex [Paragraph 1(c)] to the amended International Convention for the High Seas Fisheries of the North Pacific Ocean (INPFC), the Government of Japan may be required by the Government of the United States to accept scientific observers on board vessels fishing within the United States Fishery Conservation Zone (FCZ). In 1979, the United States placed observer teams similar to those used in 1978 on board each of the Japanese salmon motherships operating within the FCZ. One member of the two-observer team monitored salmon operations; the other observed and sampled marine mammals. In addition, the United States placed one biologist aboard each of two Japanese salmon research vessels to participate in cooperative research on the continent of origin of salmon in the land-based driftnet (LBDN) fishing area.

#### Mothership Observations in 1979

Salmon observers were placed aboard the motherships to collect data on total catch, fishing effort, and average weight of each species. One of the salmon observers conducted two tagging experiments on dead pink salmon to examine the randomness with which the fishery was sampled. The salmon observers' duties were:

- 1) Observe and record daily catch weights of salmon, by species, as the fish were transferred from each of the catcher-boats to the mothership. Each day, the observer obtained the following information from the fleet commander or Japan Fisheries Agency (JFA) inspector:
  - a) the average weight of 30 fish of each salmon species, if available, from each of 5 catcher-boats and the identification number of each of the 5 catcher-boats;
  - b) the catch weights of salmon, by species, for catcher-boats not actually observed; the total effort and effective effort in tans of gillnet for each catcher-boat in the fleet; and the geographical coordinates where each catcher-boat set its nets; and
  - c) the latitude and longitude of the mothership at noon Japan Standard Time and air and surface-water temperatures.
- 2) Record daily, or as soon as practical, the catch weight of salmon, by species, from each of the scout boats in the mothership fleet. (Data obtained from the ship's log or from the JFA inspector.) Also record the total fishing effort and effective fishing effort in tans of gillnet and latitude and longitude of each set for each of the scout boats.

- 3) Summarize daily catcher-boat landings, by salmon species; summarize catch-effort data, by 1° x 1° INPFC statistical area; and prepare a radio message for transmission to the National Marine Fisheries Service Alaska Regional Office, Juneau, Alaska.

The salmon observers gave the Japanese fleet commander on each mothership a written copy of the salmon observers' duties and a Japanese language copy of the U.S. Salmon Observer Manual to clarify why the salmon observers were aboard and precisely what the observers were to do each day.

Schedule--The four U.S. salmon observers left Seattle on 5 June 1979 and traveled via Anchorage and Adak, Alaska, before boarding a Japanese vessel on 7 June for transfer to the motherships. The motherships were monitored as follows:

<u>Vessel</u>	<u>Dates observer on board (JST)</u>
<u>Shinano Maru</u>	11 June - 12 July
<u>Meiyo Maru</u>	10 June - 3 July and 13 July - 19 July
<u>Nojima Maru</u>	9 June - 12 July
<u>Jinyo Maru</u>	11 June - 3 July and 13 July - 18 July

From 4 July to 12 July, the fleets of the Meiyo Maru and Jinyo Maru either fished in the central Bering Sea or were in transit. The U.S. observers boarded the vessels when the vessels entered the FCZ and monitored salmon catches until about 19 July. The observers aboard the Shinano Maru and Nojima Maru boarded a Japanese patrol vessel on 13 July and remained on board until all observers were picked up and returned to Adak, Alaska, on 22 July 1979.

Coverage--Salmon fishing operations of the mothership fleets in 1979 followed the pattern observed by U.S. observers in 1978. Each fleet of 43 catcher-boats set gillnets in late afternoon and began pulling in the nets early the next morning. Catches were transferred daily to each of the four motherships. The catcher-boats were moored at fore and aft weighing stations and the catch was transferred in mesh bags. Each bag contained a single species of salmon. The U.S. salmon observer could not monitor all catch weights because the catcher-boats off-loaded at both places with about 1 minute intervals between weighings. Instead, the observer randomly checked weights at both stations and recorded about 27% of the catch weights of the 37 catcher-boats. The six scout boats delivered fish, but their catches were not weighed. Observers later compared their catch records with those furnished by the JFA chief inspector. Few discrepancies were found between records. Most discrepancies were attributed to the observer's inexperience in reading the needle of the scale as it swung with the roll of the ship.

Lack of Coverage--All four motherships left the FCZ and returned during the fishing season. Salmon observers reboarded the Meiyo Maru and Jinyo Maru but did not reboard the Shiano Maru and Jinyo Maru (Table 1). Salmon motherships continued to fish within the FCZ without salmon observers aboard for 16 fleet days. (All U.S. observers were on board the Japanese patrol vessel enroute to Adak on 20 July.)

Table 1.--Dates in 1979 When Japanese Motherships Fished within FCZ. Asterisks indicate when observers were not on board the motherships when the motherships were in the FCZ.

<u>Shinano Maru</u>	11 June - 12 July 21-24 July*
<u>Meiyo Maru</u>	10 June - 3 July 13 July - 19 July 20 July - 23 July*
<u>Nojima Maru</u>	10 June - 12 July 19 -21 July*
<u>Jinyo Maru</u>	11 June - 4 July 13-18 July 19-23 July*

The Japanese motherships did send routine catch reports via telegram for the days they fished within the FCZ without U.S. observers.

#### SALMON OBSERVER PROGRAM PROBLEMS

Most U.S. salmon observers were placed on a rigid meal and bath schedule that interfered with their monitoring of salmon catches. Extended tea and meal time sessions distracted the observers from assigned duties. In addition, three of the four motherships severely restricted the movement of U.S. observers about the motherships. However, the Japanese officers were very cooperative in allowing U.S. salmon observers to board, for the first time, certain catcher boats.

U.S. salmon observers must be allowed to observe the weighing of the catches from the catcher boats without interference. Scout-boat catch-effort and locations must be included on the JFA log and must be given to the salmon observer each day. Fishing must not occur inside the FCZ without U.S. observers aboard.

#### Research Vessel Observations

The United States began in 1978 to apply scale pattern recognition techniques to determine origins of sockeye salmon and coho salmon sampled by Japanese research vessels in and just north of the landbased driftnet fishery area. Because scale samples routinely

collected by Japanese scientists are often too small to yield reliable estimates of racial composition, the United States proposed at the last INPFC Annual Meeting (30 October 1978) to place U.S. biologists on board research vessels scheduled to operate in the LBDN area in 1979. The U.S. biologists would collect additional scale samples from research catches of sockeye salmon and coho salmon. Details of the cooperative field work were discussed at the 3 March 1979 meeting of the Research Coordinating Group of the Salmon Sub-committee, and final plans and proposed techniques were submitted to the Japan Fisheries Agency for review prior to the field season.

The other objectives of the program, besides the primary one of collecting additional scale samples from sockeye salmon and coho salmon, were:

1. Document with notes and photographs all research gear and procedures used on the research vessels. Knowing the details of the Japanese research program will help U.S. scientists interpret Japanese catch and biological data and plan future longline and purse seine sampling by U.S. vessels in the western Pacific.
2. Gather data on the spatial distribution of the catch, by species, along longline gear. From these data, U.S. biologists hope to infer the degree of patchiness or aggregation of salmon in offshore waters and predict, with other data, the likely efficiency of purse-seine gear in the study area.
3. Record basic oceanographic and meteorological data three times daily. These data will provide an insight on how often sea-surface and wind conditions will limit purse-seine sampling.
4. Record incidental catches of fish, birds, and mammals, and examine subsamples of nonsalmonid fish for lengths, weights, scale and/or otolith samples, and stomach contents.
5. Record marine mammal sightings on standard forms provided by the National Marine Mammal Laboratory of National Marine Fisheries Service.

Two U.S. biologists participated in this program. One biologist worked on the Hokko Maru, a longliner, during its two cruises (11 June to 8 July 1979 and 15 July to 8 August 1979); the other scientist was assigned to the No. 2 Riasu Maru, a longliner and gillnetter, for the duration of its two cruises (10 May to 24 June 1979 and 5 July to 10 August 1979). Both biologists arrived in Japan before the departure dates and met with the JFA biologists to review the cruise plans.

Cooperation from the Japanese biologists and crew members was excellent, and the U.S. biologists were able to collect much useful material. Samples of sockeye salmon and coho salmon scales collected

by both agencies are shown in Table 2. Scale collections made by the U.S. biologist on board the No. 2 Riasu Maru were entirely from the gillnet catches. Longline catches on both vessels were nearly always completely examined by Japanese biologists. Longline catch distribution data were obtained from 11 of 48 sets made by the No. 2 Riasu Maru, and from 8 of 24 sets made by the Hokko Maru. The catch distribution data cannot be analyzed like data from a line-transect sampling design because because surface currents and wind often severely deformed the longline sets. Japanese research gear and procedures were fully described and photographed with 35 mm cameras and a 16 mm movie camera. Some differences in sampling procedures were noted between the two vessels, but most differences were due to changes that allowed the No. 2 Riasu Maru to fish simultaneously with longlines and gillnets.

In short, this cooperative field work was very worthwhile. The U.S. biologists were able to collect many additional scale samples without upsetting the schedules and procedures routinely used by the Japanese hosts. United States biologists were also able to collect considerable information that will directly assist U.S. scientists plan future tagging experiments in the LBDN area.

Table 2.--Scale samples collected during cooperative research on board Japanese salmon research vessels.

Number of fish sampled by	<u>No. 2 Riasu Maru</u>		<u>Hokko Maru</u>	
	sockeye	coho	sockeye	coho
JFA biologists	1,859	1,017	174	269
FRI biologists	<u>470</u>	<u>686</u>	<u>0</u>	<u>30</u>
Total	2,329	1,703	174	299