

PROGRESS REPORT ON THE 1985 FIELD RESEARCH ON DALL'S PORPOISE  
INCIDENTALLY TAKEN BY THE JAPANESE SALMON MOTHERSHIP GILLNET FISHERY

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by  
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Research was conducted in 1985 under the auspices of Article 10 of the International Convention of the High Seas Fisheries of the North Pacific Ocean as amended in 1978, and the Memorandum of Understanding signed in 1981 between the Governments of Japan and the United States. The areas of study by the United States were: A) monitoring of the incidental take of marine mammals; B) collection of biological samples and data from animals incidentally taken in the salmon gillnets; and C) analyses of biological specimens. This report describes the studies conducted and preliminary results of the 1985 field work.

#### A. Monitoring of the Incidental Take

Incidental take of marine mammals in the Japanese salmon mothership fishery was monitored by U.S. and Japanese observers onboard catcherboats (Table 1). In each mothership fleet one Japanese observer was aboard catcherboats throughout the fishing season. U.S. observers were aboard two catcherboats in each fleet after 14 June when fishing began in the U.S. FCZ.

In 1985, twenty-two catcherboats in each fleet were equipped with modified gillnets with 3 hollow strands present mid-net. In general, one U.S. observer in each fleet was placed on catcherboats with these modified gillnets while the other observer was placed on a vessel using a standard gillnet. The Japanese observers were usually aboard vessels using a standard gillnet, although in the Nojima Maru fleet, the Japanese observer monitored twelve gillnet sets where modified nets were used. Two additional vessels in each fleet used gillnets in which the hollow tube strands were emplaced in the upper third of the net. These modified nets were not monitored by observers. Two or

three vessels in each fleet emplaced sound generators along the nets. U.S. observers monitored 14 gillnet operations, while the Japanese observer in the Meiyo Maru fleet monitored 34 operations using this gear.

Each of the three U.S. observers rotated duty stations between the mothership and the catcherboats. An observer worked on the mothership for three days and then was assigned to a catcherboat for up to six days.

Scoutboats were not included in the monitoring since they did not return to the mothership daily and therefore could not meet the rotation schedule of observers.

On the catcherboats, observers collected marine mammal sighting data for determination of the distribution and abundance of marine mammals in the fishing area, and for each gillnet operation they collected data on environmental conditions, gear characteristics, and marine mammal, chinook and seabird entanglements.

The total number of sets monitored in the U.S. FCZ was 370 out of about 5,672 gillnet operations (6.5%). The total for all areas was 451 out of about 7,051 (6.4%)<sup>1</sup>

A total of 179 Dall's porpoise was observed entangled in gillnets in the U.S. FCZ (Table 2). The largest number observed in a single set was five (Table 2).

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<sup>1</sup> Data on total number of gillnet operations is from a report to National Marine Fisheries Service submitted by the Federation of Japan Salmon Fisheries Cooperative Association on 30 August 1985.

Incidental take rates (the number of Dall's porpoise taken incidentally per gillnet operation) were calculated for each observer for standard and modified gillnets and using the data combined for both gear types (Table 3). The observed take rate for operations using standard gillnets varied from 0.08 to 1.0. For modified gillnets the range was 0 to 0.91 (Table 3). The observed mean take rates for modified gillnets was 0.41 (53 porpoise in 130 sets) and for standard gillnets was 0.55 (111 animals in 202 sets). No significant difference in take rates between the two kinds of gear was detected (Chi Square Test;  $p > 0.10$ ) but the sample size was inadequate for these comparisons. Take rates for gillnets using acoustic generators (145 kHz) was 0.33 ( $n = 48$ ).

The incidental take of Dall's porpoise reported by the salmon mothership fishery was 2,423 inside the U.S. FCZ and 2749 for all areas (U.S. FCZ as well as north and south of the FCZ). The reported take rates were 0.43 porpoise per gillnet operation in the U.S. FCZ and 0.39 per set overall. Incidental catch rates for the period 1981-1985 for the mothership salmon fishery and salmon research vessels are shown in Figure 1. There is no apparent downward trend in these catch rates.

Total incidental take of Dall's porpoise for the fishing season was estimated using data collected by observers aboard the catcherboats and total number of gillnet operations (for methodology see Jones et al., 1984). The estimated incidental take inside the U.S. FCZ is 2,760 (95% confidence limits: 1,710-3,517)(Table 4). The total incidental take for all areas over the season is 3,239 (95% confidence limits: 1,856-4,349)(Table 4). These estimates include only the Japanese salmon mothership fishery and not the Japanese landbased salmon fishery nor the various high seas squid driftnet fisheries.

Of the Dall's porpoise examined, six were truei-type, one was black-type and the remainder were dalli-type. In the U.S. FCZ, five northern fur seals (Callorhinus ursinus) were observed entangled in the gillnets and released alive. Two of these were only momentarily entangled near the catcherboat during retrieval operations. One fur seal was taken in the Bering Sea and was released alive.

#### B. Research Aboard Salmon Motherships

One U.S. marine mammal biologist was onboard each Japanese salmon mothership operating inside the U.S. FCZ. These biologists collected biological samples and data from marine mammals taken incidentally by the fishery. They also were responsible for transmitting data on the daily incidental take of marine mammals to the U.S. National Marine Fisheries Service for monitoring catch quotas.

A total of 957 Dall's porpoise were returned and dissected or examined onboard the four motherships inside the U.S. FCZ in 1985. Nine Dall's porpoise were collected aboard the motherships south of the U.S. FCZ and dissected by U.S. biologists after boarding the vessels. Japanese nationals dissected 97 Dall's porpoise during fishing operations north of the U.S. FCZ in the Bering Sea. The total number of porpoise dissected (1,063) represents about 39% of the total number of animals reported as taken by the fishery. Approximately 25% of the animals were released alive, and 31% were lost during retrieval operations (Table 5). Twenty-nine porpoise were returned to the NMML for dissection and for training scientific observers in 1986.

### C. Analyses of biological specimens

Analyses of biological specimens in 1985 have included the following:

1. Age determination of a subsample of animals collected from from 1982-1984 in the U.S. FCZ.
2. Completion of examination of ovarian samples collected in 1984.
3. Comparisons of counts of growth layer groups in the teeth by Japanese and U.S. scientists involved in age determination of Dall's porpoise.

Results of these analyses will be presented at the annual meeting of the Scientific Subcommittee.

### References

Jones, L. L., Bouchet, G. C., Rice, D. W. and A. A. Wolman. 1984. Progress Report on Studies of the Incidental Take of Marine Mammals particularly Dall's porpoise by the Japanese Salmon Fisheries, 1978-1983. Doc. submitted to the Scientific Subcommittee of the Ad Hoc Committee on Marine Mammals, International North Pacific Fisheries Comm. 62 pp.

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TABLE 1.--Summary of gillnet operations observed in 1985 by U.S. and Japanese marine mammal observers onboard catcherboats of the Japanese salmon mothership fishery.

Mothership	Area	Number of operations	Number of sets observed	Number of days of no fishing	Retrieval dates no U.S. observer	Retrieval date no Japanese observer
<b>JINYO</b>						
	So. of FCZ	111	3	0	Jun 12, 13, 14	-
	FCZ-S	1,341	89	3	Jun 15, Jul 27,	-
	FCZ-N	9	0	0	-	-
	BS	302	21	3	-	-
	TOTAL	1,763	113	6		
<b>KIZAN</b>						
	So. of FCZ	74	2	0	Jun 12, 13	-
	FCZ-S	1,527	99	5	Jun 14, Jul 16, (17), (29), 30	Jun 14
	FCZ-N	73	4	1	-	-
	BS	136	9	0	-	-
	TOTAL	1,810	114	6		
<b>MEIYO</b>						
	So. of FCZ	110	3	0	Jun 12, 13, 14	-
	FCZ-S	1,381	91	7	Jun 15, Jul 29	Jul 28
	FCZ-N	9	0	0	-	-
	BS	255	18	0		
	TOTAL	1,755	112	7		
<b>NOJIMA</b>						
	So. of FCZ	111	2	0	Jun 12, 13, 14	Jun 12
	FCZ-S	1,321	87	7	Jun 15	Jul 06, 28
	FCZ-N	9	0	0	-	-
	BS	279	21	0	-	-
	TOTAL	1,720	110	7		

Notes: Bering Sea (BS) is defined as the area north of the U.S. Fishery Conservation Zone (FCZ).  
 FCZ-N is defined as the area inside the U.S. Fishery Conservation Zone (FCZ) north latitude 53°N.  
 KIZAN sets, July 17 and 29 observed by only one U.S. observer.

TABLE 2. Frequency of numbers of Dall's porpoise entangled per gillnet set in the U.S. Fishery Conservation Zone, 1981-1985. Data collected by marine mammal observers onboard catcherboats of the Japanese salmon mothership driftnet fishery in the western North Pacific.

Year	Number of porpoise per observed set									Total sets	Date fishing ended
	0	1	2	3	4	5	6	7	8		
1981	309	72	14	5	0	1	0	0	0	401	26 July
1982	271	114	32	19	7	3	1	0	1	443	30 July
1983	256	101	30	6	1	1	0	0	0	395	28 July
1984	251	79	24	9	0	0	0	0	0	363	26 July
1985	248	82	32	3	3	2	0	0	0	370	30 July



TABLE 3.--Observed incidental take rates of Dall's porpoise in the Japanese salmon mothership driftnet fishery in 1985. Number of operations observed in parentheses.

A. U.S. Fishery Conservation Zone, Standard Gillnets Mothership				
Observer	<u>Jinyo</u>	<u>Kizan</u>	<u>Meiyo</u>	<u>Nojima</u>
1	0.89 ( 9)	1.00 ( 5)	0.86 ( 7)	0.67 (12)
2	1.00 (11)	0.20 (10)	0.08 (12)	0.00 ( 6)
3	0.83 ( 6)	0.63 (16)	0.25 ( 8)	0.56 ( 9)
4	0.55 (31)	0.58 (36)	-	0.50 (16)
5	2.00 ( 1)	-	-	-
Mean (N)	0.73 (58)	0.57 (66)	0.32 (27)	0.49 (43)

B. U.S. Fishery Conservation Zone, Hollow Tube Gillnets (3 strands, midline) Mothership				
Observer	<u>Jinyo</u>	<u>Kizan</u>	<u>Meiyo</u>	<u>Nojima</u>
1	0.45 (11)	0.46 (13)	0.06 (16)	0.00 ( 6)
2	0.14 ( 7)	0.60 (10)	0.29 ( 7)	0.50 (10)
3	0.38 (13)	0.71 ( 7)	0.50 ( 4)	0.91 (11)
4	-	-	-	0.33 (12)
5	-	-	-	0.33 ( 3)
Mean (N)	0.35 (31)	0.57 (30)	0.19 (27)	0.50 (42)

C. U.S. Fishery Conservation Zone, All Gear Types Mothership				
Observer	<u>Jinyo</u>	<u>Kizan</u>	<u>Meiyo</u>	<u>Nojima</u>
1	0.65 (20)	0.54 (24)	0.30 (23)	0.44 (18)
2	0.67 (18)	0.40 (20)	0.16 (19)	0.28 (18)
3	0.53 (19)	0.65 (23)	0.22 (18)	0.75 (20)
4	0.55 (31)	0.58 (36)	0.35 (31)	0.43 (28)
5	2.00 ( 1)	-	-	0.33 ( 3)
Mean (N)	0.61 (89)	0.57 (103)	0.28 (91)	0.47 (87)

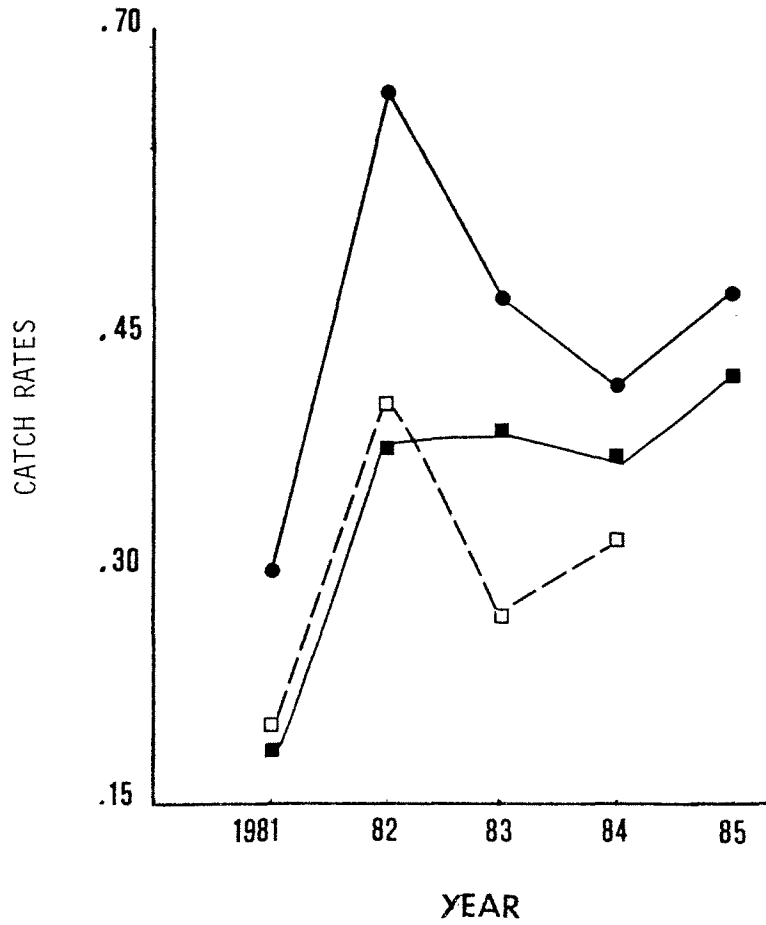
TABLE 4.--Reported and estimated incidental take and (95% confidence limits) of Dall's porpoise by the Japanese mothership fishery based upon observed take rates and total fishing effort by area in 1981-1985. Reported incidental take is from annual reports to the International North Pacific Fisheries Commission by the Japan Fisheries Agency.

Year	U.S. FCZ			All areas		
	Reported	Estimated <sup>1</sup>	n	Reported	Estimated	n
1980 <sup>2</sup>	838	5,888	18	1,000	8,970	18
1981 <sup>2</sup>	1,136	1,850	398	1,361	1,862	462
		(1,493-2,206)			(2,100-3,109)	
1982 <sup>2</sup>	2,395	4,187	414	3,189	5,903	475
		(3,494-4,881)			(4,924-6,879)	
1983 <sup>2</sup>	2,399	2,906	413	2,986	4,280	478
		(2,442-3,389)			(3,562-4,997)	
1984	2,129	2,443	363	2,670	3,355 <sup>2</sup>	486
		(1,971-1,832)			(2,636-3,972)	
1985	2,424	2,760	370	2,749	3,239	449
		(1,710-3,517)			(1,856-4,349)	

<sup>1</sup> Estimate based upon data of three observers per mothership fleet in 1981-1985 in U.S. FCZ; one observer monitoring 4 or 5 gillnet operations per fleet in 1980.

<sup>2</sup> Estimates for All Areas based on observed rates in U.S. FCZ.

Figure 1: Mean catch rates of Dall's porpoise in the western North Pacific Ocean, 1981-1985  
Mean number of porpoise taken per 330 tans of gillnet.



- Catch rates by the Japanese salmon mothership fishery based on U.S. observer data
- Catch rates by the Japanese salmon mothership fishery, based on reported data
- Catch rates by Japanese salmon research vessels based on reported data, corrected to a net size of 330 tans

