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OUTLINE OF 1983 RESEARCH ON MARINE MAMMALS, ESPECIALLY DALL'S PORPOISE
RELATING TO SALMON GILLNET FISHERY

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OUTLINE OF 1983 RESEARCH ON MARINE MAMMALS, ESPECIALLY DALL'S PORPOISES
RELATING TO SALMON GILLNET FISHERY

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The research on marine mammals was conducted in 1983 in accordance with Article 10 of the " International Convention for the High Seas Fisheries of the North Pacific Ocean" as mended in 1978, paragraph 1(c) of Annex to the Convention and Memorandum of Understanding between the government of Japan and the United States signed in 1981. 1983 is the sixth year of the research and its outline is described below.

1. Statistical data of the incidentally taken marine mammals
 - a) Mothership salmon driftnet fishery
 - b) Land-based salmon driftnet fishery
 - c) Salmon research vessels
2. Sighting survey for estimating abundance of Dall's porpoise
3. Sampling for biological studies of Dall's porpoise
 - a) Mothership salmon driftnet fishery
 - b) Land-based salmon driftnet fishery
 - c) Salmon research vessels
4. Acoustic studies
5. Japan-U.S. joint research by the dedicated vessel for Dall's porpoise research.
6. Experiment of fishing gears aimed to reduce or eliminate the incidental take of Dall's porpoise

The research for 1983 was conducted on basing the result of discussions at the meeting of the Scientific Sub-Committee of the Ad Hoc Committee on Marine Mammals, INPFC, held in Tokyo from February 21 to 25, 1983.

The items of research and their purpose are described in detail in the Memorandum of Understanding. The outline of research are described herewith by referring, as appropriate, to the items of this Memorandum of Understanding.

1. Statistical data of the incidentally taken marine mammals

The data on marine mammals incidentally taken was collected in 1983 in compliance with the provisions stipulated in each items of Memorandum of Understanding 1(a), 1(b), 1(c), 1(d), 3(a), 5(a), 5(b), 5(c) and 5(d).

Japan conducted its every possible assistance and cooperation to the scientific activities of the U.S. observers on marine mammals on board salmon motherships and catcher boats, in order to monitor incidental take of marine mammals and also verify or prove the validity of incidental take data on board the vessels.

a) Mothership salmon driftnet fishery

The data on marine mammals incidentally taken by mothership salmon fishery was collected during the fishing season. Total 2,990 marine mammals were taken, consisting of 2,986 Dall's porpoises, 4 northern fur seals. This data will be summarized in accordance with the provision 1(a) and will be reported by the date as required in Memorandum of Understanding.

Number of incidental take of marine mammals, catcher boat operations and gillnet used during 1978 to 1983 are shown in Table 1.

b) Land-based salmon driftnet fishery

The data on Dall's porpoise incidentally taken by land-based salmon dritnet fishery was collected during the 1983 fishing season. Total 1,291 Dall's porpoises were incidentally taken. This data will be summarized in accordance with the provision 1(b) and will be reported by the time of date as required in Memorandum of Understanding.

Table 2 shows number of incidental take of Dall's porpoises and gillnet used during 1978 to 1983.

c) Salmon research vessels

Thirty-one Dall's porpoise were incidentally taken in 26 experimental gillnet operations out of total 321 operations (total number of gillnet used was 39,553 tans) conducted from April to August by 9 salmon research vessels. These information will be summarized in accordance with the provision 1(c) of the Memorandum of Understanding.

Table 3 shows number of marine mammals incidentally taken by salmon research vessels during 1978 to 1983.

2. Sighting survey for estimating abundance of Dall's porpoise

Sighting survey for estimating abundance of Dall's porpoise was conducted in accordance with the provisions of 3(d), 6(a), 6(b) and 6(c) of the Memorandum of Understanding.

The survey was carried out for 579 accumulate days and 40,501 nautical miles from April 20 to August 14 by 9 salmon research vessels. Another research vessel (Hoyo maru NO.12) dedicated for Japan-U.S. joint research for Dall's porpoise also conducted sighting survey for 29 days and 2,615 miles from August 13 to September 10. The area covered by these 10 research vessels are North pacific , Bering Sea and Gulf of Alaska as same as last year.

Table 4 shows the sighting survey for marine mammals carried out by salmon and Dall's porpoise research vessels during 1978 to 1983.

3. Sampling for biological studies of Dall's porpoise

a) Mothership salmon driftnet fishery

In their conducting of biological sampling by marine mammal scientists of United States, Japan extend its every possible cooperation in compliance with the provisions of 3(c), 7(a), 7(b), 7(c) and 7(d) of the Memorandum of Undersatn- ding.

A total of 1,240 Dall's porpoises were brought back to 4 motherships for sampling of biological specimens (Table 5)

b) Land-based salmon driftnet fishery

In compliance with the provisions of item 8 of the Memorandum of Understan- ding, an adequate number of land-based salmon driftnet vessels, whose mother ports are Kushiro, were instructed to freeze and bring back to Kushiro a whole body of Dall's porpoise in case of incidental take.

The number of Dall's porpoise sampled are far below that of expected. Total eight Dall's porpoises were collected in the 1983 fishing season, including four Dall's porpoises taken south of 46°N by salmon research vessel. 2

Samples are now under morphometric measurements and anatomical examinations by Dr. Nobuyuki Miyazaki of the National Science Museum.

c) Salmon research vessel

For the Dall's porpoise taken by salmon research vessels, body length, body weight and sex were examined. Scientists of the United States on board the Hokushin maru, Oshoro maru and Hokusei maru obtained biological samples and data of Dall's porpoise.

4. Acoustic studies

In compliance with the provision of item 11 of the Memorandum of Understanding, acoustic studies on Dall's porpoise were carried out in the 2nd cruise of Wakatake maru in the Bering Sea. The purpose of the studies were to observe Dall's porpoise behavior swimming near the research vessel against variable supersonic pulse (115,143 and 75 KHZ) emitted from the device.

Preliminary observation indicates that evading action of Dall's porpoise are weakened in the order of 115, 143, 75 KHZ and no reaction was observed for 75 KHZ even at maximum sound pressure.

To warning the porpoise and sea birds swimming around the gillnet, modified carbide-gun for under water use was attached to the gillnet and tested. The result indicates that further modification (improving certainty of go into actions in the rough sea, reducing weight for handling easily) is noticed.

The data obtained are now under analyses by Dr. Yoshimi Hatakeyama, National Research Institute of Fisheries Engineering, Fisheries Agency of Japan.

5. Japan-U.S. joint research by the dedicated vessel for Dall's porpoise research.

In compliance with the provision of item 11 of the Memorandum of Understanding, the joint research for Dall's porpoise was conducted in the North Pacific Ocean.

Research vessel : Hoyo maru NO.12. 299.16 ton, 1,000 HP. Chartered by Fisheries Agency of Japan.

Period : 33 days. Depart from Kesen-numa on August 10.
Arrival to Kesen-numa on September 11.

Scientists on board : Dr. Haruo Ogi, Hokkaido University and two assistants.
No participants from United States.

The objective of the research was to obtain the biological information of Dall's porpoise out of salmon fishing season. Research was conducted from the coastal areas of Japan and extended to 178°W, farther than last year of 174°E, and 43° - 51°N in the north Pacific outside of U.S and U.S.S.R FCZ. Period on survey was August 12 to September 10.

Total 121 porpoises were caught by harpooning. They were consisted of 97 Dall's porpoises (94 dalli-type, 2 truei-type and 1 black type), 16 Pacific white-sided dorphin and 8 Right whale dorphin. Biological measurements and sampling were conducted from the catch. Sighting survey for marine mammals was also carried out on the cruise. The result of research will be reported later.

6. Experiment of fishing gears aimed to reduce or eliminate the incidental take of Dall's porpoise

In compliance with the provision of item 9 of the Memorandum of Understanding, improvement and modifications of fishing gears aimed to reducing or eliminating the incidental catch of Dall's porpoise were studied.

For this purpose, the experiments employed following five methods were conducted by commercial catcher boats in their actual fishing operations.

(1). Experimental Gear

1). Modified gillnet with three nylon air tube threads - Conventional type (Test 1-1)

Three nylon threads which normally constitute the central part of the salmon gillnet were replaced with three nylon air tube threads woven into the net to increase the reflection rate, same modified gillnet as 1981 and 1982.

2). Modified gillnet with five nylon air tube threads (Test 1-2)

To make more effective, five threads were replaced with five nylon air tube threads.

3). Gillnet with electric sound generator - Conventional type (Test 2-1)

Same sound generator with 9 KHZ was used for experiments as in 1981 and 1982.

- 4). Gillnet with electric sound generator - Simple pulse generating type (Test 2-2)
This type generate 145 KHZ supersonic pulse but with simple repeated transmission mode
- 5). Gillnet with electric sound generator - Porpoise like pulse generating type (Test 2-3)
This type generate 145-150 KHZ of supersonic pulse which seems commonly used by Dall's porpoise. Transmission mode of supersonic pulse is set to be close to clicks generating mode of Dall's porpoise.

(2). Number of catcher boats equipped with experimental gear

Modified gillnet with nylon air-tube threads

Test 1-1 : 3 vessels in each fleet, 12 vessels in total

Test 1-2 : 3 vessels in each fleet, 12 vessels in total

Gillnet with electric sound generator

Test 2-1 : 1 vessel in each fleet, 4 vessel in total

Test 2-2 : 1 vessel in each fleet, 4 vessel in total

Test 2-3 : 1 vessel in each fleet, 4 vessel in total

Total-----36 vessels

Total of 36 catcher boats used experimental gears throughout the fishing season.

(3). Results

The records of operations using these methods were collected (Table 6). Comparison of the results of the experimental operations and with those of other catcher boats using ordinary gillnet are being made, and also studies are underway on effects of using these methods upon incidental take of Dall's porpoise as well as salmon.

Table 1. Number of incidental take of marine mammals, catcher boat operations and gillnet used by mothership salmon driftnet fishery during 1978 to 1983

Year	Total number of catcher boat operation	Total number of gillnet used (in tans)	Total number of incidental take (heads)	Break down by species (heads)
1978	8,284	2,721,113	505	Dall's porpoise 497 Harbour porpoise 1 Killer whale 1 Northern fur seal 6
1979	8,611	2,798,022	688	Dall's porpoise 682 Harbour porpoise 3 Northern fur seal 3
1980	9,551	3,145,913	1,004	Dall's porpoise (dalli type 999) (truei type 1) Harbour porpoise 4
1981	8,811	2,902,231	1,370	Dall's porpoise 1,361 Northern fur seal 9
1982	8,957	2,942,443	3,199	Dall's porpoise 3,190 Northern fur seal 8 Steller sea lion 1
1983 ^a	8,967	2,954,989	2,990	Dall's porpoise 2,986 Northern fur seal 4

a Preliminary

Table 2. Number of incidental take of Dall's porpoise and gillnet used by land-based salmon driftnet fishery during 1978 to 1983

Year	Total number of gillnet used (in tans)	Total number of incidental take (heads)
1978	3,371,736	303
1979	3,218,490	127
1980	3,144,187	139
1981	3,233,925	696
1982	2,961,730	1,641
1983 ^a		1,291

a Preliminary

Table 3. Number of incidental take of marine mammals, gillnet operations and gillnet used by salmon research vessels during 1978 to 1983

Year	Number of total operations	Number of gillnet used (in tans)	Marine mammals incidentally taken		
			Species	Number of heads	Number of operations
1978	355	44,622	Porpoise	27	22
			Northern fur seal	1	1
			Seal	2	2
1979	268	34,615	Dall's porpoise	20	16
			Pacific white side dorphin	1	1
			Northern fur seal	17	12
1980	276	38,080	Dall's porpoise (d-type)	56	27
			(t-type)	1	1
			Harbour porpoise	1	1
			Northern right whale dorphin	3	1
			Unidentified porpoise	3	2
Northern fur seal	19	10			
1981	287	40,739	Dall's porpoise (d-type)	21	15
			(t-type)	1	1
			Northern right whale dorphin	3	2
			Norhtern fur seal	15	13
1982	317	40,262	Dall's porpoise (d-type)	48	37
			(t-type)	2	2
			Northern fur seal	15	11
1983 ^a	321	39,553	Dall's porpoise (d-type)	31	26

a Preliminary

Table 4. Sighting survey of Marine mammals conducted by salmon research vessels during 1978 to 1983

Year	Number of research vessels	Period of survey	Accumulated days sighted	Accumulated distance sighted (N.M)
1978	9	May 10 - Sept.14	563	36,505
1979	9	May 10 - Aug. 11	533	42,969
1980	9	Apr.21 - Aug. 13	548	44,744
1981	9	Apr.23 - Aug. 16	639	46,232
1982	10 ^b	Apr.24 - Sept.19	653	49,830
1983 ^a	10 ^b	Apr.20 - Sept.10	608	43,116

a Preliminary

b Including dedicated vessel for Dall's porpoise research

Table 5. Number of marine mammals brought back to motherships for biological samplings and periods during U.S. scientific observers on board in 1983

Name of motherships	Period during U.S. scientific observers on board motherships	Number of marine mammals brought back to motherships
<u>Kizan maru</u>	June 9 - June 25 July 3 - July 28 (43 days)	Dall's popoise 318
<u>Meiyo maru</u>	June 9 - June 25 July 6 - July 27 (39 days)	Dall's porpoise 286
<u>Nojima maru</u>	June 9 - July 5 July 16 - July 26 (38 days)	Dall's porpoise 359
<u>Jinyo maru</u>	June 9 - June 26 July 4 - July 28 (43 days)	Dall's porpoise 277
Total	163 days	Dall's porpoise 1,240

Table 6. Number of Dall's porpoise incidentally taken by experimental boats and ordinary catcher boats in 1983 fishing season

Catcher boats	Gear	Number of sets	Incidental take
Experimental boats	Test 1 - 1	627	195
	Test 1 - 2	627	197
	Test 2 - 1	209	65
	Test 2 - 2	209	63
	Test 2 - 3	209	61
Catcher boats	Ordinary net	5,851	2,033
Scout boats	Ordinary net	1,235	372
Total		8,967	2,986