

INPFC DOCUMENT
Ser. No. 2370
Rev. No. _____

Outline of research on marine mammals including dall porpoises
incidentally caught by salmon gillnets which was conducted in 1980
by Japan.

Division of North Pacific Fisheries Resources
Far Seas Fisheries Research Laboratory
Fisheries Agency

October 31, 1980

I. The research on marine mammals according to Article 10 of "International Treaty on high seas fisheries in the North Pacific Ocean" as amended in 1978, attachment 1(C) to the said treaty and the Memorandum of Understanding between the United States and Japan as pertain to dall porpoise was conducted in 1980 following 1978 and 1979 as follows. In conducting research for 1980, the result of discussion at the meeting of the Scientific Sub-Committee of the Ad Hoc Committee on Marine Mammals, INPFC which took place in Tokyo from February 25 to 29, 1980 was incorporated as far as possible so as to have an effective progress of the research plan.

1. The information of dall porpoise incidentally caught by land-based gillnets fishery was collected during the season, and we obtained data on 139 incidental catch. This data will be summarized by statistical area of 2° by 5° and by 10 days duration as is set in 1.A of the Memorandum of Understanding, in a material.

Note:	1978	303 head
	1979	127 head
	1980	139 head

2. The information on marine mammals incidentally caught by mothership-type fishery was collected during the season, and we obtained data on 1,004 incidental catch, the breakdown of which is 999 dall porpoises, 1 true porpoise and 4 harbour porpoises. This data will be summarized by statistical area of 1° by 1° and by 10 days duration as is set in 1.B of the Memorandum of Understanding.

Note:

Year	Total number of landings of catcher boat	Total number of tans hauled	Total number of incidental catch	Breakdown
1978	8,285	2,725,085	499 (+6)	497 dall porpoise 1 harbour porpoise 1 killer whale (6 northern fur seal)
1979	8,648	2,799,646	688	682 dall porpoise 3 harbour porpoise 3 northern fur seal
1980	9,549	3,149,341	1,004	999 dall porpoise 1 true porpoise 4 harbour porpoise

3. Sixty-four porpoises were incidentally caught in 32 experimental operations by gillnets (the breakdown of which is 56 dall porpoises in 28 operations, 1 true porpoise in one operation, 2 harbour porpoises in one operation, one right whale dolphin in one operation and 2 unidentified porpoises in one operation) and 19 northern fur seals in 10 operations out of a total of 276 operations (total number of tans used is 38,030) carried out by 8 salmon research vessels (including a dedicated vessel for dall porpoise, No. 81 Hoyo-Maru) from April to August, 1980. (Note: 2 dall porpoises and 1 true porpoise were caught in one operation.) These data will be summarized in a material in accordance with 2.B of the Memorandum of Understanding.

Note:

Year	Number of operations	Number of tans used	Incidental caught marine mammal		
1978	355	44,622	porpoise	22 times	(27 head)
			northern fur seal	1	(1 head)
			seal	2	(2 head)
1979	268	34,615	dall porpoise	16 times	(20 head)
			Pacific white sided dolphin	1	(1 head)
			northern fur seal	12	(17 head)
1980	276	38,080	dall porpoise	28 times	(56 head)
			true porpoise	1	(1 head)
			harbour porpoise	1	(2 head)
			unidentified porpoise	1	(2 head)
			northern fur seal	10	(19 head)

4. We conducted sighting survey for the distribution of marine mammal for a total of 548 days from April 21 to August 13, 1980 aboard 9 research vessels (including Hokko-Maru which equipped only with longlines gear and conducted salmon tagging operation) engaged in salmon research in the North Pacific Ocean and the Bering Sea. A report of the result of this sighting survey will be made separately. A total of six U.S. marine mammal scientists were aboard the 3 research vessels (including one dedicated research vessel for dall porpoise) out of the 9 already mentioned to conduct research.

Note: 1978 9 vessels May 10 to September 14 a total of 563 days
 1979 9 vessels May 10 to August 11 a total of 533 days
 1980 9 vessels April 21 to August 13 a total of 548 days

5. One scientific observer conducting biological survey of marine mammal, especially dall porpoise, was aboard each 4 salmon mother-ships. In aggregate, 925 porpoises (920 dall porpoises, 1 true porpoise and 4 harbour porpoises) were landed on mothership and went through biological examinations. However, survey on a certain portion of porpoise (36 head) out of 925, collected in high sea of the Bering Sea was carried out by Japanese assistants. Japanese counterpart extended the maximum possible assistance.

U.S. scientific observers on mother-ships transferred to catcher boats and conducted a survey on porpoise incidentally caught by salmon gillnets for a total of 18 vessels.

Name of mother-ship	Period during which U.S. scientific observer was aboard the ship	Number of porpoises landed on mother-ship
Kizan-Maru	June 9 to July 1 July 14 to July 31	214 dall porpoise
Meiyo-Maru	June 9 to June 28 July 9 to July 30	263 dall porpoise 1 true porpoise 2 harbour porpoise
Nojima-Maru	June 9 to July 9 July 19 to July 29	209 dall porpoise 2 harbour porpoise
Jinyo-Maru	June 10 to July 8 July 19 to July 30	234 dall porpoise
	<u>Total of 4 vessels</u>	(920 dall porpoise) (1 true porpoise) 925 (4 harbour porpoise)

6. One vessel out of 8 vessels referred to in item 3 or out of 9 referred to in item 4, continued to be used for Japan-U.S. joint research in 1980 as "a Japanese vessel for conducting cooperative study of dall porpoise" in accordance with the Memorandum.

Name: No.81 Hoyo-Maru (chartered by Fishery Agency of Japan)
Tonnage: 314.77, Total length: 50.43 m
Horse power: 1,150, Call sign: JHKA

The first cruise of this research vessel (left Hakodate port on May 15 and entered Hakodate port on June 27) was accompanied by 3 U.S. researchers on marine mammals (Lawrence M. Tsunoda, William A. Walker and Blair Irvine. Note: Irvine disembarked on June 1 at Adak) and 3 Japanese counterparts (Masayoshi Narita, Haruo Ogi and Yoshihiro Fujise). In accordance with research plan proposed by U.S. and examined in detail both by U.S. and Japan at the meeting of Scientific Sub-Committee held in February this year, the research was conducted with a respective major target being tagging of porpoise in the first half of the cruise and experimental operations by gillnets as a catcher boat within mother-ship fleet operation area in the latter half of the cruise.

(1) Tagging of porpoise:

May 16 to June 19. 30 tagging operations for 52 porpoises.
(All except one true porpoise were dall porpoises)

(2) Experimental operation by gillnets.

May 26 to June 21. Total number of tans used was 4,180 for 13 operations and a total of 32 dall porpoises were entangled in 10 operations. Among this, operations within this mother-ship fleet operation area, namely waters adjacent to operation area of catcher boat of the mother-ship, were carried out for 10 times from June 8 to 19, using a total of 3,300 tans of gillnets. A total of 26 dall porpoises were entangled in 8 operations out of ten.

Although no U.S. scientists embarked on the research vessel for the second cruise (left Hakodate port on July 2 and entered Hakodate port on August 11), we had 20 experimental operations by gillnets from July 10 to August 1 in the Bering Sea using a total of 2,600 tans of gillnets. A total of 11 dall porpoises were entangled in 6 operations out of 20.

II. Although the result of the research is still under analysis, it will provide valuable information for the discussion that will take place at the next meeting of the Scientific Sub-Committee of Ad Hoc committee on marine mammals, INPFC.

The noteworthy feature of 1980 in the so far obtained information is as follows:

1. It is assumed that the following difference exists between the incidental catch report of marine mammal including dall porpoise in commercial fishery and the one by salmon research vessel, in particular by dedicated vessel for dall porpoise, No. 81 Hoyo-Marui, or the one obtained through observation by U.S. scientific observers who transferred to catcher boats.

Namely, the difference arises from the difference between the definition of incidental catch by salmon gillnets and the understanding by the recorder.

Whether the entangled animal is dead or not and whether they hauled net and landed the animal on the ship or not, researchers or scientific observers usually include in the number of catches recorded as being incidental catch, the one which was lost at hauling of net after being entangled, the one which escaped at hauling of net, etc. In other words, they ordinarily record the total number of incidental catch once it is entangled in gillnets. Whereas in commercial fishery, in most cases, the incidental catch was disposed in ocean while nets are hauled without landing them on ship, because the incidental catch which has no economic value has been considered as an obstacle for operation in the past and also because it actually consumes great labor if porpoise of 100-200kg of weight is to be pulled alongside the ship in an entangled state and landed on board. Due to the above-mentioned practice, although we have been giving instructions since 1978 that porpoises and others incidentally caught should be recorded and that such catches should be brought back to the mother-ship, with the exception of the one landed on ship, the actual practice of the commercial

fishery was to exclude all catches from incidental catch, needless to say, the one lost or escaped at hauling of nets.

Therefore, this seems to be one of the reasons for a conspicuous difference between the incidental catch recorded in commercial fishery (incidental catch rate) and the one recorded either by researchers on dedicated vessel or by scientific observers.

In particular, as the change was considered to be observed this year in abundance of dall porpoise migrating to mother-ship-type fishery operation area or in vulnerability of dall porpoise to salmon gillnets, compared with those in 1978 and 1979, chances for entanglement of dall porpoise in gillnets increased. Therefore, due to cumbersome work in operation in commercial fishery, far less effort was made at hauling of net and landing porpoise on ship. It is conjectured that this resulted in a considerable decrease in the number of catches recorded as being incidental catch and the number of porpoise landed on mother-ship, from number of porpoise which are expected to be actually entangled in nets.

2. The dedicated research vessel, No. 81 Hoyo-Marui, conducted experimental operation in operation area of mother-ship fleet or in waters very adjacent to it. The result indicated extremely (almost abnormally) high incidental catch rate when compared to the figure obtained from salmon research vessel which had frequent opportunities to operate separately.

It is assumed that such high incidental catch rate was mainly due to the operating condition of dedicated ship, namely the operation of dedicated ship in operation area or in adjacent waters, where catcher boat has been operating collectively.

Unprecedentedly high distribution of juvenile Atka mackerel, Pleurogrammus monopterygius, was found in research area of dedicated research vessel (equivalent to operation area of mother-ship fishery. Note: high degree of entanglement was often observed in a part of research gillnets which has small mesh size). This predator and prey relation between porpoise and Atka mackerel may have been one contributor for high density of dall porpoise. It may be necessary to examine this incident where large number of dall porpoise were caught incidentally in terms of oceanic condition of Northwest Pacific Ocean or with total ecosystem.

III. With regard to the effect of incidental catch by salmon gillnets fishery upon dall porpoise in the North Pacific, we still maintain the same idea as is expressed in the already submitted report*.

Namely, although yearly change was found in the incidental catch rate per 1,000 tans of smaller cetaceans, mainly dall porpoises, since 1962, there is at least no trend of decrease of the rate representing the density of the dall porpoise. Then, it may be concluded that the salmon gillnets fishery has not influenced to any substantial degree the population of dall porpoise in the North Pacific. Even if we assume the annual incidental catch of dall porpoises to be 20,000 in the most flourishing periods of the fishery as estimated by Mizue, Yoshida and Takemura (1966), the catch rate was estimated to be only 0.2-0.4% of population size of dall porpoises which had been estimated at 5,000,000-10,000,000 by sight observation. Analogizing from the knowledge of other

*One of the documents which was submitted to Scientific Sub-Committee of Ad Hoc Committee on Marine Mammals, INPFC by Japanese side on February 25, 1980. (INPFC Doc. No. 2266)

cetaceans on the reproduction rate, such an incidental catch rate will not give any substantial influences on the population level of the dall porpoises.

IV. Future Studies.

Further studies should be done on the following items with a view to avoiding the incidental catch of porpoises:

1. Improvement of fishing gear and fishing methods.
2. Analysis of differences of incidental catch rate by operational pattern of salmon fishing.
3. Ecological and physiological study of porpoises.
4. Assessment of total stock size.